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## Group - Designated Uses

Properties Covered:

305(b) Designated Use parent categories:

1. Aesthetic
2. Agricultural
3. Aquatic Life Harvesting
4. Exceptional Recreational or Ecological Significance
5. Fish/Shellfish/Wildlife Protection
6. Industrial
7. Other
8. Public Water Supply
9. Recreation
10. Category 1 (Waters Meeting Standards for all Designated Uses)

Geographic Extent Note: Property includes AK/HI\*/PR/VI

\*EPA Waterscape base geography for Hawaii is not part of the Watershed Boundary Dataset used for other states ([Source](#)). The watersheds used to score Hawaii's properties are used by the Hawaii Department of Health state water quality agency. They were developed for The Commission on Water Resources Management, a state agency within the State Department of Land and Natural Resources that oversees water resource quantity, allocation, etc. and were obtained from Hudson Slay, U.S. EPA, Region 9-Pacific Islands Contact Office, 2/12/2015.

Description: State HUC12s ranked by percent area covered by NHDPlus catchments containing 305(b) Designated Use features.

Scoring Methodology: State HUC12s are placed into deciles (ten groups with equal amounts of features) according to their rank within the state. For example, features in the bottom 10% receive a score of "1" features in the next 10% receive a score of "2" and so on. An alternate scoring system was implemented whenever State HUC12s with 100% property coverage comprise more than 10% of the scored features within that state. For example, if state x has 100 State HUC12s with affected catchment areas, and 11 of those are 100% affected, then those 11 State HUC12s would be given a score of "10" and the remaining 89 features would be placed in 9 groups with equal amounts of features (or as close as possible). The list of states/properties scored in this manner is listed in Table 1. A second alternate scoring system was implemented for Alaska, due to the lack of National Hydrography Dataset (NHDPlus v2.1) Catchment features (as of 3/25/2015). Alaska State HUC12s are ranked according to the number of 305(b) listings they contain. Alaska State HUC12s with one listing are scored "5" and State HUC12s with more than one listing are scored "10"

State	Aesthetic Value	Agricultural	Aquatic Life Harvesting	Fish, Shellfish and Wildlife Protection and	Industrial	Other	Public Water Supply	Recreation	Category 1
CA				1		1	1	1	
CO		1		1			1	1	1
DC	1		1			1		1	
DE		1		1	1		1	1	
ID	1	1		1	1	1	1	1	1
IN			1	1				1	
LA			1				1		
ME			1	1		1	1	1	1
MI		1	1	1	1	1	1	1	
ND		1		1	1			1	1
NE	1	1	1		1			1	
NH			1	1			1	1	
NV	1								
NY			1	1				1	
OH			1	1			1	1	
PR				1			1	1	
UT									1
VT	1		1	1			1	1	1
WY	1	1	1	1	1		1		

Table 1

Process Details:

Part 1 – Determining State HUC12/NHDPlus Catchment associations

1. For places where State HUC 12s are generally larger than State Catchments - Associate each NHDPlus v2 Catchment (State Catchment) with the State HUC 12 where most of it exists (area predominance)
2. For places where State Catchments are generally larger than State HUC 12s, area based weighting was performed for each HUC 12 by determining the percent of the HUC 12 area covered by overlapping NHDPlus V2 Catchments

Part 2 – Determining the Percent “affected area” for each State HUC

1. Select by Location, the catchments that are touched by the applicable property (eg. Aesthetic , Public Water System, Recreation, etc).
2. Relate the catchment list from the selection to the association tables from Part 1 to obtain the full list of State HUC12/Catchment associations and areas.
3. Summarize the selected set of State HUC12s by taking 100% of the catchment areas, plus the area weighted-catchment areas. This is the numerator
4. The State HUC 12 denominator area is comprised or the sum of the area of the catchments assigned to that HUC 12 from Step 1 for the instances where the catchments are smaller than the intersecting HUC 12. This is the case for 86,388 of the 87,751 State HUC 12s in CONUS. In instances where the Catchments are larger than the underlying HUC 12, the denominator is the HUC 12 area. This is the case for 1,363 of the 87,751 State HUC 12s in CONUS.
5. Join State HUC12 Denominator area table to the State HUC12 Numerator table
6. Create a “Percent Area Affected” field to hold the result of the numerator/denominator calculation.

Download Date: 7/21/2015

Source: [Link](#)

Metadata: [Link](#)

*Citation:*

*Citation Information:*

*Originator:* US Environmental Protection Agency

*Publication Date:* 20150501

*Title:* EPA Office of Water (OW): 305(b) Waters as Assessed NHDPlus Indexed Dataset

*Edition:* 20150501

*Geospatial Data Presentation Form:* vector digital data

*Publication Information:*

*Publication Place:* Washington, DC

*Publisher:* U.S. Environmental Protection Agency

*Description:*

*Abstract:* The 305(b) program system provide assessed water data and assessed water features for river segments, lakes, and estuaries designated under Section 305(b) of the Clean Water Act. 305(b) waterbodies are coded onto NHDPlus v2.1 features creating area, point and linear events representing assessed and non-assessed waters. In addition to NHDPlus reach indexed data there may also be custom events (point, line, or area) that are not associated with NHDPlus and are in an EPA standard format that is compatible with EPA's Reach Address Database. These custom events are used to represent locations of 305(b) waterbodies that are not represented well in NHDPlus.

*Purpose:* To identify the spatial extent of waters listed under the 305(b) program attributed as being assessed in the ATTAINS database. These waters can be linked to the 305(b) information stored in the EPA's Assessment and TMDL Tracking and Implementation System (ATTAINS) for query and display. Use the Source\_FeatureID field and Cycle\_Year field to link indexed assessed waters to the EPA's ATTAINS Database.

*Supplemental Information:* Procedures Used: State Water Quality Agencies supplied EPA's Office of Water lists of waters reported under 305(b). These lists contained text which identified the locations of individual waters on their list. Many states also submitted GIS coverages and/or maps that outlined the spatial extent of their listed and assessed waters. These base materials were used by EPA to code the spatial extent onto the appropriate feature of NHDPlus to create Reach Address Database events.

*Revisions:* The event tables were sent to each state for review and comment.

*Time Period of Content:*

*Time Period Information:*

*Single Date/Time:*

*Calendar Date:* 20150501

*Currentness Reference:* publication date

*Status:*

*Progress:* In work

*Maintenance and Update Frequency:* Continually

## Group - Impairments

Properties Covered:

303(d) parent causes:

1. All Impairments
2. Nutrients \*
3. All Impairments minus Nutrients
4. Pathogens
5. Sediment
6. Temperature
7. Mercury
8. pH/Acidity/Caustic Conditions

Property Note: \*"Nutrients" category includes the following nutrient-related parent causes:

"Algal Growth", "Noxious Aquatic Plants", "Nutrients", "Organic Enrichment/Oxygen Depletion"

Geographic Extent Note: Property includes AK/HI\*/PR/VI

\*EPA Waterscape base geography for Hawaii is not part of the Watershed Boundary Dataset used for other states ([Source](#)). The watersheds used to score Hawaii's properties are used by the Hawaii Department of Health state water quality agency. They were developed for The Commission on Water Resources Management, a state agency within the State Department of Land and Natural Resources that oversees water resource quantity, allocation, etc. and were obtained from Hudson Slay, U.S. EPA, Region 9-Pacific Islands Contact Office, 2/12/2015.

Description: State HUC12s ranked by percent area covered by NHDPlus catchments containing 303(d) Impaired Waters features.

Scoring Methodology: State HUC12s are placed into deciles (ten groups with equal amounts of features) according to their rank within the state. For example, features in the bottom 10% receive a score of "1" features in the next 10% receive a score of "2" and so on. An alternate scoring system was implemented whenever State HUC12s with 100% property coverage comprise more than 10% of the scored features within that state. For example, if state x has 100 State HUC12s with affected catchment areas, and 11 of those are 100% affected, then those 11 State HUC12s would be given a score of "10" and the remaining 89 features would be placed in 9 groups with equal amounts of features (or as close as possible). The list of states/properties scored in this manner is listed in Table 1. A second alternate scoring system was implemented for Alaska, due to the lack of National Hydrography Dataset (NHDPlus v2.1) Catchment features (as of 3/25/2015). Alaska State HUC12s are ranked according to the number of 303(d) listings

they contain. Alaska State HUC12s with one listing are scored “5” and State HUC12s with more than one listing are scored “10”.

State	All	Nutrient-related	Non Nutrient-related	Pathogens	Sediment	Temperature	Mercury	pH/Acidity/Caustic Conditions	All (Listed Prior to 2002)	Nutrient-related (Listed Prior)	Non Nutrient-related (Listed Prior)	Pathogens (Listed Prior to 2002)	Mercury (Listed Prior to 2002)
CA	1	1	1	1	1	1							
CO	1	1	1			1		1					
DC	1		1		1								
FL	1	1	1					1					
ID	1		1	1	1	1	1					1	1
IN	1		1	1					1		1	1	
MI	1	1	1		1			1					
MN								1					
ND	1		1	1									
NE						1							
NY	1	1	1	1	1	1				1			
OH	1	1	1	1	1	1	1	1					
PR	1	1	1	1		1		1					
SD								1					
VI								1					
VT						1							

Table 1

Process Details:

Part 1 – Determining State HUC12/NHDPlus Catchment associations

1. For places where State HUC 12s are generally larger than State Catchments - Associate each NHDPlus v2 Catchment (State Catchment) with the State HUC 12 where most of it exists (area predominance)
2. For places where State Catchments are generally larger than State HUC 12s, area based weighting was performed for each HUC 12 by determining the percent of the HUC 12 area covered by overlapping NHDPlus V2 Catchments

Part 2 – Determining the Percent “affected area” for each State HUC

1. Select by Location, the catchments that are touched by the applicable property (eg. Aesthetic , Public Water System, Recreation, etc).
2. Relate the catchment list from the selection to the association tables from Part 1 to obtain the full list of State HUC12/Catchment associations and areas.
3. Summarize the selected set of State HUC12s by taking 100% of the catchment areas, plus the area weighted-catchment areas. This is the numerator

4. The State HUC 12 denominator area is comprised of the sum of the area of the catchments assigned to that HUC 12 from Step 1 for the instances where the catchments are smaller than the intersecting HUC 12. This is the case for 86,388 of the 87,751 State HUC 12s in CONUS. In instances where the Catchments are larger than the underlying HUC 12, the denominator is the HUC 12 area. This is the case for 1,363 of the 87,751 State HUC 12s in CONUS.
5. Join State HUC12 Denominator area table to the State HUC12 Numerator table
6. Create a "Percent Area Affected" field to hold the result of the numerator/denominator calculation.

Download Date: 6/4/2015

Source: [Link](#)

Metadata: [Link](#)

*Citation Information:*

*Originator:* US Environmental Protection Agency, Office of Water

*Publication Date:* 20150501

*Title:* EPA Office of Water (OW): 303(d) Listed Impaired Waters by Causes of Impairment and Probable Sources

*Edition:* 20150501

*Geospatial Data Presentation Form:* tabular digital data

*Publication Information:*

*Publication Place:* Washington, DC

*Publisher:* U.S. Environmental Protection Agency

*Online Linkages:*

-[http://watersgeo.epa.gov/arcgis/rest/services/OWRAD\\_NP21/303D\\_NP21/MapServer/](http://watersgeo.epa.gov/arcgis/rest/services/OWRAD_NP21/303D_NP21/MapServer/)

- <http://water.epa.gov/scitech/datait/tools/waters/data/downloads.cfm>

*Description:*

*Abstract:* The 303(d) Listed Impaired Waters program system provides impaired water data and impaired water features reflecting river segments, lakes, and estuaries designated under Section 303(d) of the Clean Water Act. Each State will establish Total Maximum Daily Loads (TMDLs) for these waters. Note the CWA Section 303(d) list of impaired waters does not represent waters that are impaired but have an EPA-approved TMDL established, impaired waters for which other pollution control mechanisms are in place and expected to attain water quality standards, or waters impaired as a result

of pollution and is not caused by a pollutant. Therefore, the "Impaired Waters" layers do not represent all impaired waters reported in a state's Integrated Report, but only the waters comprised of a state's approved 303(d) list. For more information regarding impaired waters refer to EPA's Integrated Reporting Guidance at: <http://water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/guidance.cfm>. 303(d) waterbodies are coded onto NHDPlus v2.1 flowline and waterbody features to create line, area, and point events. In addition to NHDPlus reach indexed data there may also be custom event data (point, line, or polygon) that are not associated with NHDPlus and are in an EPA standard format that is compatible with EPA's Reach Address Database. These custom features are used to represent locations of 303(d) waterbodies that are not represented well in NHDPlus.

*Purpose:* To identify the spatial extent of waters listed under 303(d). These waters can be linked to the 303(d) information stored in EPA's Assessment and TMDL Tracking and Implementation System (ATTAINS) for query and display via EPA's WATERS Expert Query Tool. The Source\_FeatureID and Cycle\_Year fields in the indexed dataset can be linked to the listed\_water\_id and cycle in EPA's Assessment and TMDL Tracking and Implementation System (ATTAINS).

*Supplemental Information: Procedures Used:* State Water Quality Agencies supplied EPA's Office of Water lists of waters reported under 303(d). These lists contained text which identified the locations of individual waters on their list. Many states also submitted GIS coverages and/or maps that outlined the spatial extent of their listed waters. These base materials were used by EPA to code the spatial extent onto NHDPlus v2.1 flowline and waterbody features to create events. Using the HEM Indexing tool (<http://water.epa.gov/scitech/datait/tools/waters/tools/hem.cfm>), event tables were created by conflating the state's data to NHD reaches and the reaches were attributed with the 303(d) identifiers supplied by the states. Revisions: The data were sent to each state for review and comment. The format of the reviewed data was state dependent; formats consisted of text descriptions or GIS datafiles. Related Spatial and Tabular Datasets: EPA's Assessment and TMDL Tracking and Implementation System (ATTAINS) contains relevant data that links to this shapefile via the WATERS Expert Query Tool. The Source\_FeatureID and Cycle\_Year fields in the geospatial layers can be linked to the listed\_water\_id and cycle fields in ATTAINS. For spatial layers containing all impaired waters (Integrated Reporting categories 4a, 4b, 4c and 5, 5m) reference the GIS layer, "305(b) Assessed Waters" from EPA's Reach Address Database.

*Time Period of Content:*

*Time Period Information:*

*Single Date/Time:*

*Calendar Date:* 20150501

*Currentness Reference:* publication date

*Status:*

*Progress:* In Work

*Maintenance and Update Frequency:* Continually



## Group – Impervious Stress (ICLUS)

Properties Covered:

1. ICLUS 2010 Estimated Impervious Surface for the Conterminous USA
2. ICLUS 2040 Estimated Impervious Surface for the Conterminous USA – 2040 housing density estimates derived based on the A2 storyline of population growth trends developed by the Intergovernmental Panel on Climate Change.  
<http://www.epcc.ch/epccreports/sres/emission/index.php?idp=94>

Geographic Extent Note: Property includes Continental US

Description: State HUC12 ranked by ICLUS values. Higher rankings are associated with higher levels of impervious and estimated impervious surface.

Scoring Methodology: State HUC12s\* are placed into deciles (ten groups with equal amounts of features) according to their rank within the state. For example, features in the bottom 10% receive a score of “1” features in the next 10% receive a score of “2” and so on.

Scoring Note: \*67 features (mostly state border, HUC12 slivers generated during the intersection process) were not able to be processed. These features are considered ‘NULL’ and are not ranked. Zeros, however, are valid measures in this dataset and thus ranked.

Process Details:

1. Zonal Stats were run for each State HUC 12 by EPA Office of Research and Development’s Global Change Research Program.

Download Date: 12/3/2013

Source: Angelica Murdukhayeva (Office of Research and Development, National Center For Environmental Assessment, Global Change Research Program)

U.S. EPA. ICLUS Tools and Datasets (Version 1.3 & 1.3.1). U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-09/143F, 2010.

Metadata: [Link](#)

*Originator:* U.S. EPA Office of Research & Development (ORD) - National Center for Environmental Assessment (NCEA) - Global Change Research Program (GCRP)

*Title:* ICLUS v1.3 Estimated Percent Impervious Surface for the Conterminous USA

*Publication Place:* Washington, DC

*Publisher:* U.S. EPA Office of Research & Development (ORD) - National Center for Environmental Assessment (NCEA) - Global Change Research Program (GCRP)

*Online Linkage:* [http://edg.epa.gov/data/Public/ORD/NCEA/is\\_iclus\\_a2.zip](http://edg.epa.gov/data/Public/ORD/NCEA/is_iclus_a2.zip)

*Description:*

Description:

*Abstract:* Climate and land-use change are major components of global environmental change with feedbacks between these components. The consequences of these interactions show that land use may exacerbate or alleviate climate change effects. Based on these findings it is important to use land-use scenarios that are consistent with the specific assumptions underlying climate-change scenarios. The

Integrated Climate and Land-Use Scenarios (ICLUS) project developed land-use outputs that are based on a downscaled version of the Intergovernmental Panel on Climate Change (IPCC) Special Report on Emissions Scenarios (SRES) social, economic, and demographic storylines. ICLUS outputs are derived from a pair of models. A demographic model generates county-level population estimates that are distributed by a spatial allocation model (SERGoM v3) as housing density across the landscape. Land-use outputs were developed for the four main SRES storylines and a baseline ("base case"). The model is run for the conterminous USA and output is available for each scenario by decade to 2100. In addition to housing density at a 1 hectare spatial resolution, this project also generated estimates of impervious surface at a resolution of 1 square kilometer.

*Purpose:* These data are intended to facilitate assessment of impacts of climate and land-use change for the contiguous USA

## Group - Drinking Water

Properties Covered:

1. Ground Water Well count

Geographic Extent Note: Property includes AK/HI\*/PR

\*EPA Waterscape base geography for Hawaii is not part of the Watershed Boundary Dataset used for other states ([Source](#)). The watersheds used to score Hawaii's properties are used by the Hawaii Department of Health state water quality agency. They were developed for The Commission on Water Resources Management, a state agency within the State Department of Land and Natural Resources that oversees water resource quantity, allocation, etc. and were obtained from Hudson Slay, U.S. EPA, Region 9-Pacific Islands Contact Office, 2/12/2015.

Description: State HUC12s ranked according to the number of Ground Water Wells within.

Scoring Methodology: Due to the relatively small number of wells and/or affected HUC 12s in many states, the State HUC12s scores are not normalized by state. The Continental U.S. State HUC12s are placed into five classes based on Jenks natural breaks and are scored as: '2', '4', '6', '8', '10'. The remaining states are placed into four classes based on Jenks natural breaks and are scored as: '1', '4', '7', '10'.

CONUS scores/well count

- 2: 1-7 wells
- 4: 8-20 wells
- 6: 21-42 wells
- 8: 43-86 wells
- 10: 87-258 wells

OCONUS scores/well count

- 1: 1-5 wells
- 4: 6-15 wells
- 7: 16-35 wells
- 10: 36-80 wells

Process Details:

1. Spatial Join the Public Ground Water Wells to the State HUC 12s

Download Date: 3/20/2015

Source: [Link](#)

Safe Drinking Water Information System (SDWIS), U.S. EPA Office of Ground Water and Drinking Water, 2014, 4<sup>th</sup> Quarter.

Metadata:

Public water system ground water wells from SDWIS 2014 Q4.

A public water system (PWS) is a system for the provision to the public of water for human consumption through pipes or other constructed conveyances, if such system has at least fifteen service connections or regularly serves at least twenty-five individuals.

The public drinking water systems regulated by EPA, and delegated states and tribes, provide drinking water to 90 percent of Americans. These public drinking water systems, which may be publicly- or privately-owned, serve at least 15 service connections or 25 persons.

## Group - Drinking Water

Properties Covered:

1. Ground Water Well System Populations

Geographic Extent Note: Property includes AK/HI\*/PR

\*EPA Waterscape base geography for Hawaii is not part of the Watershed Boundary Dataset used for other states ([Source](#)). The watersheds used to score Hawaii's properties are used by the Hawaii Department of Health state water quality agency. They were developed for The Commission on Water Resources Management, a state agency within the State Department of Land and Natural Resources that oversees water resource quantity, allocation, etc. and were obtained from Hudson Slay, U.S. EPA, Region 9-Pacific Islands Contact Office, 2/12/2015.

Description: State HUC12s ranked according to the Population served by Ground Water Well systems within.

Scoring Methodology: State HUC12s are placed into deciles (ten groups with equal amounts of features) according to their rank within the state. For example, features in the bottom 10% receive a score of "1" features in the next 10% receive a score of "2" and so on.

Process Details:

2. Intersect the Public Ground Water Wells and the State HUC 12s
3. Summarize based on unique State HUC12/Public Water Systems (PWS ID) combinations, taking the Min or Max Population (PWS populations are based on the population served by the entire system, so the populations are repetitive and can be sourced in this summary step using either the 'Min' or 'Max' function)
4. Summarize the unique State HUC12/Public Water Systems (PWS ID) combinations from Step 2 by State HUC12, summing the Populations

Download Date: 3/20/2015

Source: [Link](#)

Safe Drinking Water Information System (SDWIS), U.S. EPA Office of Ground Water and Drinking Water, 2014, 4<sup>th</sup> Quarter.

Metadata:

Public water system ground water wells from SDWIS 2014 Q4.

A public water system (PWS) is a system for the provision to the public of water for human consumption through pipes or other constructed conveyances, if such system has at least fifteen service connections or regularly serves at least twenty-five individuals.

The public drinking water systems regulated by EPA, and delegated states and tribes, provide drinking water to 90 percent of Americans. These public drinking water systems, which may be publicly- or privately-owned, serve at least 15 service connections or 25 persons.

## Group - Drinking Water

Properties covered:

1. Surface Water System Populations

Geographic Extent Note: Property includes AK/HI\*/PR

\*EPA Waterscape base geography for Hawaii is not part of the Watershed Boundary Dataset used for other states ([Source](#)). The watersheds used to score Hawaii's properties are used by the Hawaii Department of Health state water quality agency. They were developed for The Commission on Water Resources Management, a state agency within the State Department of Land and Natural Resources that oversees water resource quantity, allocation, etc. and were obtained from Hudson Slay, U.S. EPA, Region 9-Pacific Islands Contact Office, 2/12/2015.

Description: State HUC12s ranked according to the Population served by Surface Water systems (Facility Types: "Intakes", "Springs", and "Reservoirs", all of which can be referred to as "Intakes") within.

Scoring Methodology: State HUC12s are placed into deciles (ten groups with equal amounts of features) according to their rank within the state. For example, features in the bottom 10% receive a score of "1" features in the next 10% receive a score of "2" and so on.

Process Details:

5. Intersect the Surface Water Intakes and the State HUC 12s
6. Summarize based on unique State HUC12/Public Water Systems (PWS ID) combinations, taking the Min or Max Population (PWS populations are based on the population served by the entire system, so the populations are repetitive and can be sourced in this summary step using either the 'Min' or 'Max' function)
7. Summarize the unique State HUC12/Public Water Systems (PWS ID) combinations from Step 2 by State HUC12, summing the Populations

Download Date: 3/20/2015

Source: [U.S. EPA Office of Ground Water and Drinking Water \(OGWDW\)](#)

Safe Drinking Water Information System (SDWIS), U.S. EPA Office of Ground Water and Drinking Water, 2014, 4<sup>th</sup> Quarter.

Metadata:

Surface water intakes from SDWIS 2014 Q4.

A [public water system \(PWS\)](#) is a system for the provision to the public of water for human consumption through pipes or other constructed conveyances, if such system has at least fifteen service connections or regularly serves at least twenty-five individuals.

The public drinking water systems regulated by EPA, and delegated states and tribes, provide drinking water to 90 percent of Americans. These public drinking water systems, which may be publicly- or privately-owned, serve at least 15 service connections or 25 persons.



## Group - Drinking Water

Properties Covered:

1. Source Water Protection Areas (SPAs)

Geographic Extent Note: Property includes AK/HI\*/PR/VI

\*EPA Waterscape base geography for Hawaii is not part of the Watershed Boundary Dataset used for other states ([Source](#)). The watersheds used to score Hawaii's properties are used by the Hawaii Department of Health state water quality agency. They were developed for The Commission on Water Resources Management, a state agency within the State Department of Land and Natural Resources that oversees water resource quantity, allocation, etc. and were obtained from Hudson Slay, U.S. EPA, Region 9-Pacific Islands Contact Office, 2/12/2015.

Description: State HUC12s ranked by their Percent area covered by all SPAs (SPAs may be superimposed). SPAs are vector polygons composed of all NHDPlus catchments located one day's time of travel upstream from inland water surface facility point events related to surface water drinking water system facilities, georeferenced to initialized inland flowlines in the enhanced NHD (NHDPlus) in the EPA Office of Water's Reach Address Database Version. The drinking water surface water source locations are the active sources (i.e., intakes, reservoirs, and springs) of water with available locations (lat/longs).

Scoring Methodology: State HUC12s are placed into deciles (ten groups with equal amounts of features) according to their rank within the state. For example, features in the bottom 10% receive a score of "1" features in the next 10% receive a score of "2" and so on.

Scoring Note: HUC12s with less than 2% dissolved SPA area, are not considered for scoring.

Process Details:

8. Intersect the SPAs and the State HUC 12s and sum the intersecting area per State HUC 12 and divide by the State HUC 12 area (overlapping SPAs make it possible to have over 100% coverage)

SDWIS data for CONUS and AK:

Download Date: 3/20/2015

Source: [Link](#)

Safe Drinking Water Information System (SDWIS), U.S. EPA Office of Ground Water and Drinking Water, 2014, 4<sup>th</sup> Quarter.

Metadata:

SPAs from SDWIS 2014 Q4.

SDWIS data for HI/PR/VI:

Download Date: 7/6/2015

Source: [Link](#)

Safe Drinking Water Information System (SDWIS), U.S. EPA Office of Ground Water and Drinking Water, 2015, 1<sup>st</sup> Quarter.

Metadata:

SPAs from SDWIS 2015 Q1

A public water system (PWS) is a system for the provision to the public of water for human consumption through pipes or other constructed conveyances, if such system has at least fifteen service connections or regularly serves at least twenty-five individuals.

The public drinking water systems regulated by EPA, and delegated states and tribes, provide drinking water to 90 percent of Americans. These public drinking water systems, which may be publicly- or privately-owned, serve at least 15 service connections or 25 persons.

## Group – Socioeconomic Indicators

Properties Covered:

1. Environmental Justice (EJSCREEN - Primary Demographic Index)

Geographic Extent Note: Property includes AK/HI\*/PR

\*EPA Waterscape base geography for Hawaii is not part of the Watershed Boundary Dataset used for other states ([Source](#)). The watersheds used to score Hawaii's properties are used by the Hawaii Department of Health state water quality agency. They were developed for The Commission on Water Resources Management, a state agency within the State Department of Land and Natural Resources that oversees water resource quantity, allocation, etc. and were obtained from Hudson Slay, U.S. EPA, Region 9-Pacific Islands Contact Office, 2/12/2015.

Description: State HUC12s ranked by Environmental Justice Primary Demographic Index (PDI), defined as the average of percent minority and percent low income in the Census block group. Percent low income is essentially all residents where household income is below twice the federally defined poverty threshold, as a percentage of all those for whom this poverty ratio could be determined (typically known for the vast majority of the block group's population).

Scoring Methodology: State HUC12s are placed into deciles (ten groups with equal amounts of features) according to their rank within the state. For example, features in the bottom 10% receive a score of "1" features in the next 10% receive a score of "2" and so on. For Alaska, where Block Groups are generally larger than HUC12s, there are many statistical ties between HUC12 features. Thus, Alaska HUC12s are scored '1'-'10' based on their Area Weighted PDI using a Jenks classification system with classes:

0% - 8.94% = 1  
>8.94% - 20.44% = 2  
>20.44% - 30.78% = 3  
>30.78% - 41.40% = 4  
>41.40% - 51.84% = 5  
>51.84% - 57.52% = 6  
>57.52% - 62.08% = 7  
>62.08% - 66.89% = 8  
>66.89% - 71.73% = 9  
>71.73% - 81.92% = 10

Scoring Note: State HUC12 base geography contains coastal areas not included in Census geography. These State HUC12s are not scored.

Process Details:

1. Census Block Group PDI values aggregated to State HUC12s using area weighting procedure designed to deal with Percent values. The denominator used in the calculation is that of the 'target' feature, the State HUC 12s.
2. Area Weighting values are multiplied by the PDI values to arrive at an 'Area Weighted PDI'.
3. Summarize State HUC12s, taking the sum of the 'Area Weighted PDI' to produce the total 'Area Weighted PDI' for each State HUC12

Download Date: 5/17/2014

Source: [Link](#)

US Environmental Protection Agency, Environmental Justice (EJSCREEN) Block Group Data (USEPA), U.S. Environmental Protection Agency, Headquarters, Washington, DC, 20120703

Metadata:

Environmental Justice (EJSCREEN) Block Group Data (USEPA)

*Citation:*

*Citation Information:*

*Originator:* US Environmental Protection Agency

*Title:* Environmental Justice (EJSCREEN) Block Group Data (USEPA)

*Publication Information:*

*Publisher:* U.S. Environmental Protection Agency, Headquarters

*Publication Place:* Washington, DC

*Publication Date:* 20120703

*Online Linkage:* <http://edg.epa.gov>

*Description:*

*Abstract:* EJSCREEN is an environmental justice screening tool that provides EPA with a nationally consistent approach to screening for potential areas of EJ concern that may warrant further investigation. The EJ indexes are block group level results that combine multiple demographic factors with a single environmental variable (such as proximity to traffic) that can be used to help identify communities living with the greatest potential for negative environmental and health effects. This table provides demographic data, environmental data, and EJ indexes for every block group in the US. The EJSCREEN tool is currently for internal EPA use only. It is anticipated that as users become accustomed to this new tool, individual programs within the Agency will develop program use guidelines and a community of practice will develop around them within the EPA GeoPlatform. Users should keep in mind that screening tools are subject to substantial uncertainty in their demographic and environmental data, particularly when looking at small geographic areas, such as Census block groups. Data on the full range of environmental impacts and demographic factors in any given location are almost certainly not available directly through this tool, and its initial results should be supplemented with additional information and local knowledge before making any judgments about potential areas of EJ concern.

*Purpose:* Provide a nationally consistent environmental justice screening tool for internal use at USEPA.

*Time Period of Content:*

*Currentness Reference:* Varies based on input data sources

*Time Period Information:*

*Single Date/Time:*

*Calendar Date:* 20120703

*Status:*

*Progress:* Complete

*Maintenance and Update Frequency:* annually if funds are available

*Access Constraints:* Data Are Restricted to Internal EPA Personnel Only

*Use Constraints:* These data should not be distributed to users unless distribution is explicitly granted. Please check sources, scale, accuracy, currentness and other available information. Please confirm that

you are using the most recent copy of both data and metadata. Acknowledgement of the EPA would be appreciated.

*Security Information:*

*Security Classification System:* FIPS Pub 199

*Security Classification:* No Confidentiality

*Security Handling Description:* Standard Technical Controls

*Point of Contact:*

*Contact Information:*

*Contact Person Primary:*

*Contact Organization:* U.S. Environmental Protection Agency, Office of the Administrator, Office of Policy

*Contact Person:* Bridgid Curry

*Contact Position:* Regulatory Analyst

*Contact Address:*

*Address Type:* mailing address

*Address:* 1200 Pennsylvania Avenue, N.W.

*City:* Washington

*State or Province:* DC

*Postal Code:* 20460

*Contact Voice Telephone:* 202-565-2567

*Contact Electronic Mail Address:* curry.bridgid@epa.gov

*Contact Instructions:* <http://www.epa.gov/>

*Data Quality Information:*

*Logical Consistency Report:* Tests for integrity have not been performed.

*Completeness Report:* Features represented have not been tested for completeness

*Positional Accuracy:*

*Horizontal Positional Accuracy:*

*Horizontal Positional Accuracy Report:* Data were collected using methods that have unknown accuracy (EPA National Geospatial Data Policy [NGDP] Accuracy Tier 10). For more information, please see EPA's NGDP at <http://epa.gov/geospatial/policies.html>

*Lineage:*

*Process Step:*

*Process Date:* 060112

*Process Description:* Methodology to Translate NATA 2005 Data from Census 2000 to Census 2010 Geographies included in Entity and Attribute Information Overview section of metadata.

*Process Step:*

*Process Date:* 060112

*Process Description:* Methods to calculate indexes included in attribute section

*Spatial Reference Information:*

*Horizontal Coordinate System Definition:*

*Geographic:*

*Latitude Resolution:* 0.000001

*Longitude Resolution:* 0.000001

*Geographic Coordinate Units:* Decimal degrees

*Geodetic Model:*

*Horizontal Datum Name:* World Geodetic System 1984

*Ellipsoid Name:* WGS\_1984

*Semi-major Axis:* 6378137.000000

*Denominator of Flattening Ratio:* 298.257224

*Entity and Attribute Information:*

*Detailed Description:*

*Entity Type:*

*Entity Type Label:* ejsscreen\_full

*Entity Type Definition:* EJScreen database of all attributes used in web-based tool.

*Entity Type Definition Source:* USEPA

*Attribute:*

*Attribute Label:* OBJECTID

*Attribute Definition:* Internal feature number.

*Attribute Definition Source:* ESRI

*Attribute Domain Values:*

*Unrepresentable Domain:* Sequential unique whole numbers that are automatically generated.

*Attribute:*

*Attribute Label:* Shape

*Attribute Definition:* Feature geometry.

*Attribute Definition Source:* ESRI

*Attribute Domain Values:*

*Unrepresentable Domain:* Coordinates defining the features.

*Attribute:*

*Attribute Label:* ID

*Attribute Definition:* FIPS for Block Group

*Attribute Definition Source:* USEPA

*Attribute Domain Values:*

*Codeset Domain:*

*Codeset Name:* FIPS

*Codeset Source:* US Census Bureau

*Attribute:*

*Attribute Label:* STATE\_NAME

*Attribute Definition:* State name

*Attribute Definition Source:* USEPA

*Attribute Domain Values:*

*Unrepresentable Domain:* US state and territory names.

*Attribute:*

*Attribute Label:* ST\_ABBREV

*Attribute Definition:* 2-character State Abbreviation

*Attribute Definition Source:* USEPA

*Attribute Domain Values:*

*Unrepresentable Domain:* US state and territory PO abbreviations.

*Attribute:*

*Attribute Label:* REGION

*Attribute Definition:* EPA Region

*Attribute Definition Source:* USEPA

*Attribute Domain Values:*

*Range Domain:*

*Range Domain Minimum:* 1

*Range Domain Maximum:* 10

*Attribute:*

*Attribute Label:* ACSTOTPOP

*Attribute Definition:* Total Population from American Community Survey January 1, 2006 to December 31, 2010

*Attribute Definition Source:* USEPA

*Attribute Domain Values:*

*Unrepresentable Domain:* Numeric Value.

*Attribute:*

*Attribute Label:* MINORPCT

*Attribute Definition:* The percent of individuals in a block group who list their racial status as a race other than white alone and/or list their ethnicity as Hispanic or Latino. That is, all people other than non-Hispanic white-alone individuals. The word "alone" in this case indicates that the person is of a single race, since multi race individuals are tabulated in another category " a non-Hispanic individual who is half white and half American Indian would be counted as a minority by this definition. Census definitions of race/ethnicity are available at:

<http://www.census.gov/population/www/socdemo/race/index.html> and the questions asked about race are available at:

[http://www.census.gov/acs/www/about\\_the\\_survey/questions\\_and\\_why\\_we\\_ask/](http://www.census.gov/acs/www/about_the_survey/questions_and_why_we_ask/)

*Attribute Definition Source:* USEPA

*Attribute Domain Values:*

*Unrepresentable Domain:* Numeric Value - Percent.

*Attribute:*

*Attribute Label:* LOWINCPCT

*Attribute Definition:* The percent of a block group's population in households where the household income is less than or equal to twice the relevant level defining "poverty level". More information on the federally-defined poverty threshold is available at

<http://www.census.gov/hhes/www/poverty/methods/definitions.html>.

*Attribute Definition Source:* USEPA

*Attribute Domain Values:*

*Unrepresentable Domain:* Numeric Value - Percent.

*Attribute:*

*Attribute Label:* VULEOPCT

*Attribute Definition:* Primary Demographic Index - The average of percent minority and percent low income in the block group.

*Attribute Definition Source:* USEPA

*Attribute Domain Values:*

*Unrepresentable Domain:* Numeric Value - Percent.

*Overview Description:*

*Entity and Attribute Overview:* Methodology to Translate NATA 2005 Data from Census 2000 to Census 2010 Geographies Translate Census 2000 Block-Level Data to Census 2010 Block Groups The following NATA 2005 datasets at the Census 2000 block level contain population-based data for certain environmental risks. • Cancer Risk • Respiratory Hazard Index • Diesel Particulate Matter These were rolled up to 2010 block group estimates using a simple population weighted average of all blocks in a block group. A correspondence file was provided by Esri that provided population weights for each Census 2000 block to each Census 2010 block group. The following steps were performed to accomplish this. 1. For each record in the Esri correspondence file, multiplied the associated EPA score by the population weight value. For Census 2000 blocks assigned to a single Census 2010 block group, the entire score was assigned to that block group. For Census 2000 blocks assigned to two or more Census 2010 block groups, the score was divided between the block groups proportionally. 2. To calculate the population weighted average, divided the sum of all scores associated with a Census 2010 block group by the sum of the population weight values for each Census 2000 block associated with the block group. Translate Census 2000 Tract-Level Data to Census 2010 Block Groups The NATA 2005 Neurological Hazard Index dataset contained data at the Census 2000 tract level. Per EPA, this was downscaled to the block group level by simply assigning the parent tract score to each child block group. A correspondence file was provided by Esri that provided population weights for each Census 2000 block group to each Census 2010 block group The following steps were performed to accomplish this. 1. Translated the Census 2000 tract-level data to Census 2000 block groups, simply assigning each child block group the parent tract's score. 2. For each record in the correspondence file, multiplied the associated EPA score by the population value. For Census 2000 block groups assigned to a single Census 2010 block group, the entire score was assigned to that block group. For Census 2000 block groups assigned to two or more Census 2010 block groups, the score was divided between the block groups proportionally. 3. To calculate the population weighted average, divided the sum of all scores associated with a Census 2010 block group by the sum of the population weight values for each Census 2000 block group associated with the Census 2010 block group. Description of PM and Ozone Data The 2012 version of EJSCREEN uses 2008 predictions of PM2.5 and ozone ambient concentrations. The PM2.5 and ozone ambient predictions are based on fusing both modeling and monitoring data using a "downscaling" method developed by Dr. David Holland of EPA's Office of Research and Development (ORD). ORD applied this methodology to population-weighted block group centroids provided by OAR, to predict PM2.5 and ozone at each of more than 200,000 points. GIS metadata describing a tract-level application of the same approach is provided here: [http://www.epa.gov/esd/land-sci/lcb/pdf/DSMetadataAir\\_0612.pdf](http://www.epa.gov/esd/land-sci/lcb/pdf/DSMetadataAir_0612.pdf) The EJSCREEN data is simply a block group application of this methodology, summarized as annual average PM2.5 and summer seasonal average of the 8-hour daily maximum values for ozone. Detailed documentation and tract-level, daily predictive surfaces using the



downscaler method are provided here: [http://www.epa.gov/esd/land-sci/lcb/lcb\\_faqs.html](http://www.epa.gov/esd/land-sci/lcb/lcb_faqs.html) As the documentation summarizes this approach: "A Bayesian space-time downscaler model (see DSMetadataAir for journal references, description, limitations, and uses. Please read this file before downloading the predictive surfaces) is used to "fuse" daily ozone (8-hr max) and fine particulate air (24-hr average) monitoring data from the National Air Monitoring Stations/State and Local Air Monitoring Stations (NAMS/SLAMS) with 12 km gridded output from the Models-3/Community Multiscale Air Quality (CMAQ) model." The National Center for Environmental Health provided resources to help support the development of the O3 and PM2.5 predictive surfaces through its Environmental Public Health Tracking system.

*Entity and Attribute Detail Citation:* overview description provided by Esri

*Distribution Information:*

*Resource Description:* Downloadable Data

*Distribution Liability:* Although these data have been processed successfully on a computer system at the Environmental Protection Agency, no warranty expressed or implied is made regarding the accuracy or utility of the data on any other system or for general or scientific purposes, nor shall the act of distribution constitute any such warranty. It is also strongly recommended that careful attention be paid to the contents of the metadata file associated with these data to evaluate data set limitations, restrictions or intended use. The U.S. Environmental Protection Agency shall not be held liable for improper or incorrect use of the data described and/or contained herein.

*Distributor:*

*Contact Information:*

*Contact Person Primary:*

*Contact Organization:* U.S. Environmental Protection Agency, Office of the Administrator, Office of Policy

*Contact Person:* Bridgid Curry

*Contact Position:* Regulatory Analyst

*Contact Address:*

*Address Type:* mailing address

*Address:* 1200 Pennsylvania Avenue, N.W.

*City:* Washington

*State or Province:* DC

*Postal Code:* 20460

*Contact Voice Telephone:* 202-565-2567

*Contact Electronic Mail Address:* [curry.bridgid@epa.gov](mailto:curry.bridgid@epa.gov)

*Contact Instructions:* <http://www.epa.gov/>

*Metadata Reference Information:*

*Metadata Date:* 20120703

*Metadata Future Review Date:* 20160703

*Metadata Standard Name:* FGDC Content Standard for Digital Geospatial Metadata

*Metadata Standard Version:* FGDC-STD-001-1998

*Metadata Contact:*

*Contact Information:*

*Contact Person Primary:*

*Contact Organization:* U.S. Environmental Protection Agency, Office of the Administrator, Office of Policy

*Contact Person:* Bridgid Curry

*Contact Position:* Regulatory Analyst

*Contact Address:*

*Address Type:* mailing address

*Address:* 1200 Pennsylvania Avenue, N.W.

*City:* Washington

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*Postal Code:* 20460

*Contact Voice Telephone:* 202-565-2567

*Contact Electronic Mail Address:* curry.bridgid@epa.gov

*Contact Instructions:* <http://www.epa.gov/>

## Group – Socioeconomic Indicators

Properties Covered:

### 1. Economic Stress Indicator

Geographic Extent Note: Property includes AK/HI\*/PR

\*EPA Waterscape base geography for Hawaii is not part of the Watershed Boundary Dataset used for other states ([Source](#)). The watersheds used to score Hawaii's properties are used by the Hawaii Department of Health state water quality agency. They were developed for The Commission on Water Resources Management, a state agency within the State Department of Land and Natural Resources that oversees water resource quantity, allocation, etc. and were obtained from Hudson Slay, U.S. EPA, Region 9-Pacific Islands Contact Office, 2/12/2015.

Description: State HUC12s ranked by Economic Stress Indicator, which is the average rank of a block group, within its state, for five separate economic indicators calculated from US Census American Community Survey 2008-2012 estimates:

1. Percent Families Below Poverty Level :  
(Total Families with income in the past 12 months below poverty level)/(Total Families) x 100
2. Unemployment Rate:  
Unemployed/[(Total Pop 16+)-(Armed Forces)-(Not in Labor Force)] x 100
3. Per Capita Income:
4. Educational Attainment:  
(Sum of all Degree Types\*)/(Population 25 yrs and over) x 100  
\*Associates Degree, Bachelor's Degree, Master's Degree, Professional School Degree, Doctorate Degree
5. Housing Affordability Index:  
(Median Household Income in the past 12 months)/(Median Value Owner Occupied Units\*\*) x 100  
\*\*for county

Scoring Methodology: State HUC12s are placed into deciles (ten groups with equal amounts of features) according to their rank within the state. For example, features in the bottom 10% receive a score of "1" features in the next 10% receive a score of "2" and so on. For Alaska, where Block Groups are generally larger than HUC12s, there are many statistical ties between HUC12 features. Thus, Alaska HUC12s are scored '1'-'10' based on their Area Weighted PDI using a Jenks classification system with classes:

0% - 38.65% = 1  
>38.65% - 47.25% = 2  
>47.25% - 52.61% = 3  
>52.61% - 57.38% = 4  
>57.38% - 60.72% = 5  
>60.72% - 63.47% = 6  
>63.47% - 66.08% = 7  
>66.08% - 69.09% = 8  
>69.09% - 72.14% = 9  
>72.14% - 85.79% = 10

Scoring Note: State HUC12 base geography contains coastal areas not included in Census geography. These State HUC12s are not scored.

Rank order of economic indicators (High ranking is BAD/Low ranking is GOOD):

1. Percent Families Below Poverty Level - Ascending
2. Unemployment Rate - Ascending
3. Per Capita Income - Descending
4. Educational Attainment - Descending
5. Housing Affordability Index - Descending

Process Details:

4. Block Groups are ranked separately according to each of the 5 variables
5. A percent rank (within the state) is derived for each variable.
6. The ESI is then calculated by averaging the 5 percent ranks for each Block Group
7. Census Block Group ESI values aggregated to State HUC12s using area weighting procedure designed to deal with Percent values. The denominator used in the calculation is that of the 'target' feature, the State HUC 12s.
8. Multiply the ESI by the area weights to arrive at an 'Area Weighted ESI'
9. Summarize State HUC12s, taking the sum of the 'Area Weighted ESI' to produce the total 'Area Weighted ESI' for each State HUC 12

Download Date: 4/1/2014

Source: [Link](#)

American Community Survey - United States Census Bureau. "Summary File." 2008 – 2012 American Community Survey. U.S. Census Bureau's American Community Survey Office, 2012. Web. Feb 2014

Metadata: [Link](#)

## Group – Ag Nutrient Yield (SPARROW)

Properties Covered:

1. Nitrogen Agricultural Incremental Yield
2. Phosphorus Agricultural Incremental Yield

Property Note: USGS has granted interim approval of the estimates for Incremental N and P Yields state rankings shown in these layers. Final approval pending publication of documentation (expected early 2015).

Geographic Extent Note: Property includes Continental US

Description: State HUC12s ranked, by state, based on HUC12 SPARROW nitrogen and phosphorus agricultural loading.

Scoring Methodology: State HUC12s are placed into deciles (ten groups with equal amounts of features) according to their rank within the state. For example, features in the bottom 10% receive a score of “1” features in the next 10% receive a score of “2” and so on.

Process Details:

1. Perform Coefficient of Areal Correspondence (CAC) between two WBD versions. CAC is computed as the Intersection area (between the two features with a common ID) and the Union area (of the same two features). This measures the overall areal correspondence between the two versions of the same feature. Any features with a CAC 90% or higher are considered a direct match and the original SPARROW data value is used. 325 (of the 83,015) NHDPlus V2 HUC 12s did not have matches.
2. Intersect the unmatched HUC12s with the SPARROW HUC12s to find pairs of HUC12s with high intersection percent (50% or greater). Transfer IDs from one HUC12 dataset to the other for these pairs. Perform a CAC (step 1 procedure) on these features. This is referred to as a ‘location-based CAC. 211 HUC12s have a CAC score of 90% or higher and are thus considered direct matches and the original SPARROW data value is used. 114 scored less than 90%.
3. Perform a ‘value-based area weighting’ for the 114 HUC 12s with low CAC scores (<90% CAC) from the first two steps. This is an area weighting procedure designed to deal with numeric values. When area weighting numeric values, the denominator used is that of the ‘join’ feature, which in this case, is the Sept 2011 WBD. The final values for this set of HUC12s are calculated by multiplying the original SPARROW values for each HUC 12s by the area weight value
4. Total HUC12 SPARROW values are then calculated by summing the transferred and/or derived SPARROW values for each HUC 12.
5. HUC 12 values transferred to State HUC 12s via tabular join

Download Date: 3/28/2013

Source: [Link](#) (data acquired from John Brakebill, USGS)

U.S. Geological Survey, 2012. SPARROW Model Yield Estimates of Nitrogen and Phosphorus from Agricultural Lands Assigned to the National Watershed Boundary 12 Digit Hydrologic Units.

Metadata:

Purpose and Scope: In response to a specific data request by the U.S. Department of Agriculture (USDA), National Resource Conservation Service (NRCS), incremental (local) yield estimates of nitrogen and phosphorus from agricultural sources were compiled based on regional and national nutrient SPARROW models recently published by the U.S. Geological Survey (USGS) (Preston and others, 2011). These estimates were aggregated based on an area weight to 12 digit hydrologic units (HUC12) represented by the National Watershed Boundary (WBD) dataset (U.S. Geological Survey and others, 2011). The comma delimited data file generated for this request (*huc12\_sparrow\_yields.csv*) is intended to be used as a guide to help the requesting agency prioritize and focus management actions designed to improve water quality.

Attributes in data file HUC12\_SPARROW\_YIELDS.csv: kilograms per square kilometer per year  
HU12 – 12 digit hydrologic unit number as defined by the National Watershed Boundary Dataset  
tn\_ag\_yield – SPARROW estimated local yield of total nitrogen from agricultural sources, kg/km<sup>2</sup>/yr  
tp\_ag\_yield – SPARROW estimated local yield of total phosphorus from agricultural sources, kg/km<sup>2</sup>/yr  
Supplemental Information: Three spatial networks were used to support SPARROW model predictions applied in this analysis:

- 1) NHDPlus for the New England and Mid-Atlantic (MRB1)
  - a. <http://www.horizon-systems.com/nhdplus/data.php>
- 2) MRB\_E2rf1 for the regional Major River Basin (MRB) models in the South Atlantic-Gulf (MRB2), Upper Mississippi (MRB3), Lower Mississippi (MRB5), Missouri (MRB4), and Pacific Northwest regions (MRB7).
  - a. [http://water.usgs.gov/GIS/metadata/usgswrd/XML/mrb\\_e2rf1.xml](http://water.usgs.gov/GIS/metadata/usgswrd/XML/mrb_e2rf1.xml) - reaches
  - b. [http://water.usgs.gov/GIS/metadata/usgswrd/XML/mrb\\_e2rf1ws.xml](http://water.usgs.gov/GIS/metadata/usgswrd/XML/mrb_e2rf1ws.xml) - catchments
- 3) Erf1\_2 for the west (MRB8) and southwest regions (MRB6).
  - a. [http://water.usgs.gov/GIS/metadata/usgswrd/XML/erf1\\_2.xml](http://water.usgs.gov/GIS/metadata/usgswrd/XML/erf1_2.xml) - reaches and catchments

Details on spatial networks supporting SPARROW modeling can be found in Brakebill and others, 2011. The term “catchment” refers to the delineation of area draining a specific stream-reach, as defined by the specified reach network, and identified by a unique code. For simplicity in this document, the MRB SPARROW model network used in the Northeast region will be referred as “the NHDPlus” network. All other model networks (national and regional MRB models excluding the Northeast) will be referred as “RF1” networks. All SPARROW model predictions are associated with a specific catchment. Stream-reach catchments vary in scale from 1:500,000 (RF1) to the more detailed NHDPlus at 1:100,000 scale. Nutrient SPARROW model predictions for the west and southwest regions are based on methods described in Alexander and others, 2008. All other SPARROW model predictions are described in Preston and others, 2011 and found online within the USGS SPARROW Decision Support tool (U.S. Geological Survey, 2011). References are listed at the end of this document.

The term “incremental” or “local” refers to each individual stream reach catchment and associated estimated yields generated within that catchment, independent of upstream contributions (Preston and others, 2011).

Process steps: Because of variations in scale between SPARROW reach networks and the WBD, several approaches were taken in order to assign SPARROW predictions to HUC12's. In most cases, more than

one HUC 12 exists within an RF1 catchment. The opposite holds true for the NHDPlus network, where multiple catchments exist within a HUC12.

- 1) The WBD was obtained from the NRCS website:  
<http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/ngmc>  
For this analysis, the September, 2011 version of the WBD was used.
- 2) For the RF1 models:
  - a. A 100m Cell size raster representing RF1 SPARROW catchments was overlaid with 100m cell size data representing the WBD (HUC12's). The ArcGIS combine tool was used for this process. The area of any given HUC12 within an RF1 catchment (unique combination of WBD and SPARROW catchment) was computed (using cell count and cell size).
  - b. A fraction (area weighting factor) of HUC12 area within an RF1 catchment area was computed as the area of HUC12 within the catchment divided by the RF1 catchment area.
  - c. SPARROW model predictions for nitrogen and phosphorus were simplified to reflect local (incremental) contributions (kg) to streams from agricultural sources for each catchment. These include animal manure and commercial fertilizer applied to corn, soybeans, alfalfa, and other crops.
  - d. For each unique combination of SPARROW catchment and HUC12, the weighting factor was multiplied by the local SPARROW load prediction for that catchment.
  - e. SPARROW predictions (load) were then summed by HUC12.
  - f. Yields were computed by dividing the load estimate for each HUC12 by the area of that HUC12.
- 3) For the NHDPlus model:
  - a. HUC12's within each NHDPlus catchment were identified. This was computed by overlaying the centroid of the HUC12's with the NHDPlus catchments.
  - b. SPARROW model predictions for nitrogen and phosphorus were simplified to reflect local (incremental) contributions (kg) to streams from agricultural sources. These include animal manure and commercial fertilizer applied to corn, soybeans, alfalfa, and other crops.
  - c. SPARROW predictions (load) were summed by HUC12.
  - d. Yields were computed by dividing the load estimate for each HUC12 by the area of that HUC12.

Distribution Liability: Although this data set has been compiled by the U.S. Geological Survey, U.S. Department of the Interior, no warranty expressed or implied is made by the U.S. Geological Survey as to the accuracy of the data and related materials. The act of distribution shall not constitute any such warranty, and no responsibility is assumed by the U.S. Geological Survey in the use of this data, software, or related materials. Any use of trade, product, or firm names is for descriptive purposes only and does not imply endorsement by the U.S. Government.

Points of Contact:

Stephen Preston, USGS, Dover, Delaware, 302-734-2506 [spreston@usgs.gov](mailto:spreston@usgs.gov)

John Brakebill, USGS, Baltimore, Maryland, 443-498-5557 [jwbrakeb@usgs.gov](mailto:jwbrakeb@usgs.gov)

References:

Alexander, R.B., Smith, R.A., Schwarz, G.E., Boyer, E.W., Nolan, J.V., and Brakebill, J.W., 2008, Differences in phosphorus and nitrogen delivery to the Gulf of Mexico from the Mississippi River Basin,

*Environ. Sci. Technol.*, 42, 3, 822-830, 10.1021/es0716103. Available online at

<http://pubs.acs.org/doi/abs/10.1021/es0716103>

Brakebill, J.W., Wolock, D. M. and Terziotti, S. E., 2011. Digital Hydrologic Networks Supporting Applications Related to Spatially Referenced Regression Modeling. *JAWRA Journal of the American Water Resources Association*, 47: 916–932. doi: 10.1111/j.1752-1688.2011.00578.x in Preston et al., 2011. Available online at: <http://onlinelibrary.wiley.com/doi/10.1111/j.1752-1688.2011.00578.x/full>

Preston, S. D., Alexander, R. B. and Wolock, D. M. (2011), Sparrow Modeling to Understand Water-Quality Conditions in Major Regions of the United States: A Featured Collection Introduction. *JAWRA Journal of the American Water Resources Association*, 47: 887–890. Available online at:

<http://onlinelibrary.wiley.com/doi/10.1111/j.1752-1688.2011.00585.x/abstract>

U.S. Geological Survey, 2011. SPARROW Decision Support System. Available online at:

<http://cida.usgs.gov/sparrow/>

U.S. Geological Survey and U.S. Department of Agriculture, Natural Resources Conservation Service, 2011, Federal Standards and procedures for the National Watershed Boundary Dataset (WBD), (2d ed.):

U.S. Geological Survey Techniques and Methods 11–A3, 62 p. Available online at:

<http://pubs.usgs.gov/tm/tm11a3/>



## Group - Superfund

### Properties Covered:

1. National Priority List
2. National Non-Priority List
3. All Superfund sites

Geographic Extent Note: Property includes AK/HI\*/PR/VI

\*EPA Waterscape base geography for Hawaii is not part of the Watershed Boundary Dataset used for other states ([Source](#)). The watersheds used to score Hawaii's properties are used by the Hawaii Department of Health state water quality agency. They were developed for The Commission on Water Resources Management, a state agency within the State Department of Land and Natural Resources that oversees water resource quantity, allocation, etc. and were obtained from Hudson Slay, U.S. EPA, Region 9-Pacific Islands Contact Office, 2/12/2015.

Description: State HUC12s ranked based on the count of CERCLIS National Priority List sites, National Non-Priority List sites, and all Superfund sites.

Scoring Methodology: State HUC12 scores are not normalized by state. State HUC12s with one site are scored "5" and State HUC12s with more than one site are scored "10".

### Process Details:

1. Spatial Join CERCLIS National Priority List sites, CERCLIS National Non-Priority List, and all Superfund sites to State HUC12s
2. Summarize State HUC12 ID field to obtain counts for each property per State HUC12

Download Date: 5/28/2014

Source: [Link](#)

EPA Facility Registry Service (FRS): CERCLIS, United States Environmental Protection Agency, Office of Environmental Information, Washington, DC, 20140520.

Metadata: [Link](#)

#### *Citation Information:*

*Originator:* United States Environmental Protection Agency, Office of Environmental Information

*Publication Date:* 20140520

*Title:* EPA Facility Registry Service (FRS): CERCLIS

*Geospatial Data Presentation Form:* vector digital data

#### *Publication Information:*

*Publication Place:* Washington, DC

*Publisher:* U.S. Environmental Protection Agency

*Online Linkage:* [http://geodata.epa.gov/arcgis/rest/services/OEI/FRS\\_INTERESTS/MapServer](http://geodata.epa.gov/arcgis/rest/services/OEI/FRS_INTERESTS/MapServer)

*Online Linkage:* <https://edg.epa.gov/clipship/>

#### *Description:*

*Abstract:* This data provides location and attribute information on Facilities regulated under the Comprehensive Environmental Responsibility Compensation and Liability Information System (CERCLIS) for intranet web feature service. The data provided in this service are obtained from EPA's Facility

Registry Service (FRS). The FRS is an integrated source of comprehensive (air, water, and waste) environmental information about facilities, sites or places. This service connects directly to the FRS database to provide this data as a feature service. FRS creates high-quality, accurate, and authoritative facility identification records through rigorous verification and management procedures that incorporate information from program national systems, state master facility records, data collected from EPA's Central Data Exchange registrations and data management personnel. Additional Information on FRS is available at the EPA website <http://www.epa.gov/frs/index.htm>.

*Purpose:* The purpose of this web feature service is to provide users with access to information stored in the Comprehensive Environmental Responsibility Compensation and Liability Information System (CERCLIS) database, made available through direct connection to FRS. The information in FRS may be used to track sites, facilities, or areas of environmental interest.

*Supplemental Information:* This is an EPA-Produced Data Set. This data set is one in a series of Image and Feature Services published by USEPA. Additional services can be found at the <http://geogateway.epa.gov/Portal> website.

*Time Period of Content:*

*Currentness Reference:* Publication date

*Time Period Information:*

*Single Date/Time:*

*Calendar Date:* 20140520

*Status:*

*Progress:* Complete

*Maintenance and Update Frequency:* Continually

*Theme:*

*Theme Keyword Thesaurus:* User

*Access Constraints:* None.

*Use Constraints:* None. Please check sources, scale, accuracy, currentness and other available information. Please confirm that you are using the most recent copy of both data and metadata.

Acknowledgement of the EPA would be appreciated.

*Native Data Set Environment:* Microsoft Windows XP Version 5.1 (Build 2600) Service Pack 3; ESRI ArcCatalog 9.3.1.3000

*Security Information:*

*Security Classification System:* FIPS Pub 199

*Security Classification:* No Confidentiality

*Security Handling Description:* Standard Technical Controls

*Point of Contact:*

*Contact Information:*

*Contact Organization Primary:*

*Contact Organization:* U.S. Environmental Protection Agency, Headquarters

*Contact Person:* David Smith

*Contact Position:* FRS Project Manager

*Contact Address:*

*Address Type:* mailing and physical address

*Address:* 1200 Pennsylvania Ave, NW

*City:* Washington

*State or Province:* DC

*Postal Code:* 20460

*Contact Voice Telephone:* (202) 566-0797

*Contact Electronic Mail Address:* smith.davidg@epa.gov

*Contact Instructions:* <http://www.epa.gov/>

*Data Quality Information:*

*Logical Consistency Report:* Locations are tested and reported individually

*Completeness Report:* Completeness of the data set varies for individual features.

*Positional Accuracy:*

*Horizontal Positional Accuracy:*

*Horizontal Positional Accuracy Report:* FRS uses a best-pick algorithm to provide horizontal positional information. This assigns the latitude and longitude with the best accuracy value to each facility. Because information in FRS is collected across numerous states and programs, positional accuracy for the data set varies for each individual feature and is stored on a record-level basis. Overall horizontal positional accuracy for the entire data set fluctuates as new information is received and is not estimated for the entire data set within this record. For more information on accuracy of FRS locations, visit <http://www.epa.gov/frs/index.htm>.

*Lineage:*

*Process Step:*

*Process Description:* Metadata Created

*Spatial Data Organization Information:*

*Direct Spatial Reference Method:* Vector

*Point and Vector Object Information:*

*SDTS Terms Description:*

*SDTS Point and Vector Object Type:* Entity point

*Point and Vector Object Count:* 9697

*Spatial Reference Information:*

*Vertical Coordinate System Definition:*

*Altitude System Definition:*

*Altitude Resolution:* 1.000000

*Altitude Encoding Method:* Explicit elevation coordinate included with horizontal coordinates

*Horizontal Coordinate System Definition:*

*Geographic:*

*Latitude Resolution:* 0.000001

*Longitude Resolution:* 0.000001

*Geographic Coordinate Units:* Decimal degrees

*Geodetic Model:*

*Horizontal Datum Name:* North American Datum of 1983

*Ellipsoid Name:* Geodetic Reference System 1980

*Semi-major Axis:* 6378137.000000

*Denominator of Flattening Ratio:* 298.257222

*Entity and Attribute Information:*

*Detailed Description:*

*Entity Type:*

*Entity Type Label:* FRS\_INTEREST\_CERCLIS

*Entity Type Definition:* Attribute table describes point features

*Entity Type Definition Source:* ESRI

*Attribute:*

*Attribute Label:* OBJECTID

*Attribute Definition:* Unique Number Assigned by ESRI

*Attribute Definition Source:* EPA FRS Data Dictionary

*Attribute Domain Values:*

*Unrepresentable Domain:* Unknown

*Attribute:*

*Attribute Label:* ACTIVE\_STATUS

*Attribute Definition:* A Y/N code that indicates whether the environmental interest is active at the facility or site.

*Attribute Definition Source:* EPA FRS Data Dictionary

*Attribute:*

*Attribute Label:* HUC8\_CODE

*Attribute Definition:* 8 Digit Hydrologic Unit Code

*Attribute Definition Source:* United States Geological Survey hierarchical system of hydrologic units

*Attribute:*

*Attribute Label:* FAC\_URL

*Attribute:*

*Attribute Label:* GEO\_LOC\_REF\_ID

*Attribute Definition:* A sequential reference number assigned to a latitude and longitude coordinate pair.

*Attribute Definition Source:* FRS Development Team

*Attribute:*

*Attribute Label:* REGISTRY\_ID

*Attribute Definition:* The identification number assigned by the EPA Facility Registry Service to uniquely identify a facility site.

*Attribute Definition Source:* EPA FRS Data Dictionary

*Attribute Domain Values:*

*Unrepresentable Domain:* Unknown

*Attribute:*

*Attribute Label:* PRIMARY\_NAME

*Attribute Definition:* The public or commercial name of a facility site (i.e., the full name that commonly appears on invoices, signs, or other business documents, or as assigned by the state when the name is ambiguous).

*Attribute Definition Source:* EPA FRS Data Dictionary

*Attribute Domain Values:*

*Unrepresentable Domain:* Unknown

*Attribute:*

*Attribute Label:* LOCATION\_ADDRESS

*Attribute Definition:* The address that describes the physical (geographic) location of the front door or main entrance of a facility site, including urban-style street address or rural address.

*Attribute Definition Source:* EPA FRS Data Dictionary

*Attribute Domain Values:*

*Unrepresentable Domain:* Unknown

*Attribute:*

*Attribute Label:* CITY\_NAME

*Attribute Definition:* The name of the city, town, village or other locality, when identifiable, within whose boundaries (the majority of ) the facility site is located. This is not always the same as the city used for USPS mail delivery.

*Attribute Definition Source:* EPA FRS Data Dictionary

*Attribute Domain Values:*

*Unrepresentable Domain:* Unknown

*Attribute:*

*Attribute Label:* COUNTY\_NAME

*Attribute Definition:* The name of the U.S. county or county equivalent in which the facility site is physically located.

*Attribute Definition Source:* EPA FRS Data Dictionary

*Attribute Domain Values:*

*Unrepresentable Domain:* Unknown

*Attribute:*

*Attribute Label:* FIPS\_CODE

*Attribute Definition:* The code that represents the county or county equivalent and the state or state equivalent of the United States.

*Attribute Definition Source:* EPA FRS Data Dictionary

*Attribute Domain Values:*

*Unrepresentable Domain:* Unknown

*Attribute:*

*Attribute Label:* STATE\_CODE

*Attribute Definition:* The U.S. Postal Service abbreviation that represents the state or state equivalent for the U.S. and Canada.

*Attribute Definition Source:* EPA FRS Data Dictionary

*Attribute Domain Values:*

*Unrepresentable Domain:* Unknown

*Attribute:*

*Attribute Label:* POSTAL\_CODE

*Attribute Definition:* The combination of the 5-digit Zone Improvement Plan (ZIP) code and the four-digit extension code (if available) that represents the geographic segment that is a subunit of the ZIP Code, assigned by the U.S. Postal Service to a geographic location; or the postal zone specific to the country, other than the U.S., where the facility site is located.

*Attribute Definition Source:* EPA FRS Data Dictionary

*Attribute Domain Values:*

*Unrepresentable Domain:* Unknown

*Attribute:*

*Attribute Label:* PGM\_SYS\_ACRNM

*Attribute Definition:* The Acronym of the Program responsible for submitting the information to FRS

*Attribute Definition Source:* EPA FRS Data Dictionary

*Attribute Domain Values:*

*Unrepresentable Domain:* Unknown

*Attribute:*

*Attribute Label:* PGM\_SYS\_ID

*Attribute Definition:* The unique identification number, assigned by the EPA Facility Registry Service, to the facility site

*Attribute Definition Source:* EPA FRS Data Dictionary

*Attribute Domain Values:*

*Unrepresentable Domain:* Unknown

*Attribute:*

*Attribute Label:* LATITUDE83

*Attribute Definition:* The measure of the angular distance on a meridian north or south of the equator in NAD83

*Attribute Definition Source:* Summary Report of Locational Data Elements for the Latitude/Longitude Data Standard - Draft, dated 5/19/98, Data Element: Latitude Measure.

*Attribute:*

*Attribute Label:* LONGITUDE83

*Attribute Definition:* Summary Report of Locational Data Elements for the Latitude/Longitude Data Standard - Draft, dated 5/19/98, Data Element: Latitude Measure.

*Attribute Definition Source:* Summary Report of Locational Data Elements for the Latitude/Longitude Data Standard - Draft, dated 5/19/98, Data Element: Latitude Measure.

*Attribute:*

*Attribute Label:* ACCURACY\_VALUE

*Attribute Definition:* Summary Report of Locational Data Elements for the Latitude/Longitude Data Standard - Draft, dated 5/19/98, Data Element: Latitude Measure.

*Attribute Definition Source:* Summary Report of Locational Data Elements for the Latitude/Longitude Data Standard - Draft, dated 5/19/98, Data Element: Latitude Measure.

*Attribute:*

*Attribute Label:* COLLECT\_MTH\_DESC

*Attribute Definition:* The method used to determine the latitude and longitude coordinates for a point on the earth.

*Attribute Definition Source:* Summary Report of Locational Data Elements for the Latitude/Longitude Data Standard - Draft, dated 5/19/98, Data Element: Horizontal Collection Method Code

*Attribute:*

*Attribute Label:* REF\_POINT\_DESC

*Attribute Definition:* Summary Report of Locational Data Elements for the Latitude/Longitude Data Standard - Draft, dated 5/19/98, Data Element: Horizontal Collection Method Code

*Attribute Definition Source:* Summary Report of Locational Data Elements for the Latitude/Longitude Data Standard - Draft, dated 5/19/98, Data Element: Reference Point Description

*Attribute:*

*Attribute Label:* CREATE\_DATE

*Attribute Definition:* A system-generated value that represents the calendar date and time the corresponding information was posted to the database.

*Attribute Definition Source:* FRS Development Team, May 2000.

*Attribute:*

*Attribute Label:* UPDATE\_DATE

*Attribute Definition:* A system-generated value that represents the most recent calendar date and time the corresponding information was updated in the database.

*Attribute Definition Source:* A system-generated value that represents the most recent calendar date and time the corresponding information was updated in the database.

*Attribute:*

*Attribute Label:* LAST\_REPORTED\_DATE

*Attribute Definition:* The most recent date the corresponding environmental interest data was reported to the Source of Data.

*Attribute Definition Source:* FRS Development Team, April 2000.

*Attribute:*

*Attribute Label:* PUBLIC\_IND

*Attribute Definition:* Indicates whether or not the associated data is accessible by the public on the internet.

*Attribute Definition Source:* FRS Development Team, February 2002

*Attribute:*

*Attribute Label:* INTEREST\_TYPE

*Attribute Definition:* The regulatory interest type identified for the facility.

*Attribute Definition Source:* EPA FRS Data Dictionary

*Attribute Domain Values:*

*Unrepresentable Domain:* Unknown

*Attribute:*

*Attribute Label:* SHAPE

*Attribute Definition:* Feature geometry.

*Attribute Definition Source:* ESRI

*Attribute Domain Values:*

*Unrepresentable Domain:* Coordinates defining the features.

*Overview Description:*

*Entity and Attribute Overview:* Attribute information presented below is derived from FRS database owners and reference material. For additional information regarding attributes listed in this metadata record, please visit

[http://www.epa.gov/enviro/html/frs\\_demo/FRS\\_Ops\\_and\\_Qual\\_Report\\_Appendices.pdf](http://www.epa.gov/enviro/html/frs_demo/FRS_Ops_and_Qual_Report_Appendices.pdf).

*Entity and Attribute Detail Citation:* The following sources were used to derive the attribute information presented in the attribute detailed citation below: EPA FRS Data Dictionary; FRS Development Team, April 1999; FRS Data Sources, [http://www.epa.gov/enviro/html/frs\\_demo/FRS\\_Ops\\_and\\_Qual\\_Report\\_Appendices.pdf](http://www.epa.gov/enviro/html/frs_demo/FRS_Ops_and_Qual_Report_Appendices.pdf)

*Distribution Information:*

*Resource Description:* Live Data and Maps

*Distribution Liability:* All systems made available through this service are publicly accessible excluding RMP information. Although these data have been processed successfully on a computer system at the Environmental Protection Agency, no warranty expressed or implied is made regarding the accuracy or utility of the data on any other system or for general or scientific purposes, nor shall the act of distribution constitute any such warranty. It is strongly recommended that careful attention be paid to the contents of the metadata file associated with these data to evaluate data set limitations, restrictions or intended use. The U.S. Environmental Protection Agency shall not be held liable for improper or incorrect use of the data described and/or contained herein.

*Distributor:*

*Contact Information:*

*Contact Organization Primary:*

*Contact Organization:* U.S. Environmental Protection Agency, Headquarters

*Contact Person:* David Smith

*Contact Position:* FRS Project Manager

*Contact Address:*

*Address Type:* mailing and physical address

*Address:* 1200 Pennsylvania Ave, NW

*City:* Washington

*State or Province:* DC

*Postal Code:* 20460

*Contact Voice Telephone:* (202) 566-0797

*Contact Electronic Mail Address:* [smith.davidg@epa.gov](mailto:smith.davidg@epa.gov)

*Contact Instructions:* <http://www.epa.gov/>

*Metadata Reference Information:*

*Metadata Date:* 20120620

*Metadata Future Review Date:* 20160620

*Metadata Standard Name:* FGDC Content Standards for Digital Geospatial Metadata

*Metadata Standard Version:* FGDC-STD-001-1998

*Metadata Time Convention:* local time

*Metadata Extensions:*

*Online Linkage:* <http://www.esri.com/metadata/esriprof80.html>

*Profile Name:* ESRI Metadata Profile

*Metadata Contact:*

*Contact Information:*

*Contact Organization Primary:*

*Contact Organization:* U.S. Environmental Protection Agency, Research Triangle Park



*Contact Person:* EPA GIS Agency Central Support

*Contact Position:* OEI RTP NCC GIS

*Contact Address:*

*Address Type:* mailing and physical address

*Address:* USEPA Mailroom N127-02

*City:* Research Triangle Park

*State or Province:* NC

*Postal Code:* 27711

*Contact Voice Telephone:* 919-767-7493

*Contact Electronic Mail Address:* [esrisupport@epa.gov](mailto:esrisupport@epa.gov)

*Contact Instructions:* <http://intranet.epa.gov/rtpgis>

## Group - RCRA

Properties Covered:

1. RCRA Active Sites
2. RCRA Inactive Sites

Geographic Extent Note: Property includes AK/HI\*/PR/VI

\*EPA Waterscape base geography for Hawaii is not part of the Watershed Boundary Dataset used for other states ([Source](#)). The watersheds used to score Hawaii's properties are used by the Hawaii Department of Health state water quality agency. They were developed for The Commission on Water Resources Management, a state agency within the State Department of Land and Natural Resources that oversees water resource quantity, allocation, etc. and were obtained from Hudson Slay, U.S. EPA, Region 9-Pacific Islands Contact Office, 2/12/2015.

Description: State HUC12s ranked based on the count of RCRA Active sites and RCRA Inactive sites

Scoring Methodology: State HUC12 scores are not normalized by state. Intrinsic scoring as follows:  
CONUS

Active Sites

1-4 sites (approximately the lowest 50% of State HUC12s nationally) = 1

5-15 sites (the next highest 25%) = 4

16-50 sites (the next highest 12.5%) = 7

50 or more sites (the highest 12.5%) = 10

Inactive sites

1-2 sites (approximately the lowest 50% of State HUC12s nationally) = 1

3-9 Inactive sites (the next highest 25%) = 4

10-29 Inactive sites (the next highest 12.5%) = 7

30 or more Inactive sites (the highest 12.5%) = 10

OCONUS

Active Sites

1-2 sites (approximately the lowest 50% of State HUC12s nationally) = 1

3-8 sites (the next highest 25%) = 4

9-17 sites (the next highest 12.5%) = 7

18 or more sites (the highest 12.5%) = 10

Inactive sites

1-2 sites (approximately the lowest 50% of State HUC12s nationally) = 1

3-7 Inactive sites (the next highest 25%) = 4

8-16 Inactive sites (the next highest 12.5%) = 7

17 or more Inactive sites (the highest 12.5%) = 10

Process Details:

3. Spatial Join RCRA Active sites, and RCRA Inactive sites to State HUC12s

4. Summarize State HUC12 ID field to obtain counts for each property per State HUC12

Download Date: 6/24/2014

Source: [Link](#)

EPA Facility Registry Service (FRS): RCRA, United States Environmental Protection Agency, Office of Environmental Information, Washington, DC, 20140520.

Metadata: [Link - EPA Facility Registry Service \(FRS\): RCRA\\_ACTIVE](#)

Metadata: [Link - EPA Facility Registry Service \(FRS\): RCRA\\_INACTIVE](#)

### **EPA Facility Registry Service (FRS): RCRA\_ACTIVE**

*Identification Information:*

*Citation:*

*Citation Information:*

*Originator:* United States Environmental Protection Agency, Office of Environmental Information

*Publication Date:* 20141022

*Title:* EPA Facility Registry Service (FRS): RCRA\_ACTIVE

*Geospatial Data Presentation Form:* vector digital data

*Publication Information:*

*Publication Place:* Washington, DC

*Publisher:* U.S. Environmental Protection Agency

*Online Linkage:* [http://geodata.epa.gov/arcgis/rest/services/OEI/FRS\\_INTERESTS/MapServer](http://geodata.epa.gov/arcgis/rest/services/OEI/FRS_INTERESTS/MapServer)

*Online Linkage:* <https://edg.epa.gov/clipship/>

*Description:*

*Abstract:* This web feature service contains location and facility identification information from EPA's Facility Registry Service (FRS) for the subset of active hazardous waste facilities that link to the Resource Conservation and Recovery Act Information System (RCRAInfo). EPA's comprehensive information system in support of the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984, RCRAInfo tracks many types of information about generators, transporters, treaters, storers, and disposers of hazardous waste. FRS identifies and geospatially locates facilities, sites or places subject to environmental regulations or of environmental interest. Using vigorous verification and data management procedures, FRS integrates facility data from EPA's national program systems, other federal agencies, and State and tribal master facility records and provides EPA with a centrally managed, single source of comprehensive and authoritative information on facilities. This data set contains the subset of FRS integrated facilities that link to active RCRAInfo hazardous waste facilities once the RCRAInfo data has been integrated into the FRS database. Additional information on FRS is available at the EPA website <http://www.epa.gov/enviro/html/fii/index.html>

*Purpose:* The purpose of this web feature service is to provide users with access to integrated facility information from FRS, limited to the subset of active hazardous waste facilities that link to the Resource Conservation and Recovery Act Information System (RCRAInfo).

*Supplemental Information:* This is an EPA-Produced Data Set. This data set is one in a series of Image and Feature Services published by USEPA. Additional services can be found at <https://edg.epa.gov/>

*Time Period of Content:*

*Currentness Reference:* Publication date

*Time Period Information:*

*Single Date/Time:*

*Calendar Date:* 20141022

*Status:*

*Progress:* Complete

*Maintenance and Update Frequency:* Monthly

*Spatial Domain:*

*Bounding Coordinates:*

*West Bounding Coordinate:* -176.652500

*East Bounding Coordinate:* 144.897360

*North Bounding Coordinate:* 71.292591

*South Bounding Coordinate:* -14.286600

*Access Constraints:* None.

*Use Constraints:* None. Please check sources, scale, accuracy, currentness and other available information. Please confirm that you are using the most recent copy of both data and metadata.

Acknowledgement of the EPA would be appreciated.

*Native Data Set Environment:* Microsoft Windows XP Version 5.1 (Build 2600) Service Pack 3; ESRI ArcCatalog 9.3.1.3000

*Security Information:*

*Security Classification System:* FIPS Pub 199

*Security Classification:* No Confidentiality

*Security Handling Description:* Standard Technical Controls

*Point of Contact:*

*Contact Information:*

*Contact Organization Primary:*

*Contact Organization:* U.S. Environmental Protection Agency, Headquarters

*Contact Person:* David Smith

*Contact Position:* FRS Project Manager

*Contact Address:*

*Address Type:* mailing and physical address

*Address:* 1200 Pennsylvania Ave, NW

*City:* Washington

*State or Province:* DC

*Postal Code:* 20460

*Contact Voice Telephone:* (202) 566-0797

*Contact Electronic Mail Address:* smith.davidg@epa.gov

*Contact Instructions:* <http://www.epa.gov/>

*Data Quality Information:*

*Logical Consistency Report:* Locations are tested and reported individually

*Completeness Report:* Completeness of the data set varies for individual features.

*Positional Accuracy:*

*Horizontal Positional Accuracy:*

*Horizontal Positional Accuracy Report:* FRS uses a best-pick algorithm to provide horizontal positional information. This assigns the latitude and longitude with the best accuracy value to each facility. Because information in FRS is collected across numerous states and programs, positional accuracy for the data set varies for each individual feature and is stored on a record-level basis. Overall horizontal positional accuracy for the entire data set fluctuates as new information is received and is not estimated for the entire data set within this record. For more information on accuracy of FRS locations, visit <http://www.epa.gov/frs/index.htm>.

*Lineage:*

*Source Information:*

*Source Citation Abbreviation:* RCRAINFO

*Source Contribution:* Hazardous waste information is contained in the Resource Conservation and Recovery Act Information (RCRAInfo), a national program management and inventory system about hazardous waste handlers. In general, all generators, transporters, treaters, storers, and disposers of hazardous waste are required to provide information about their activities to state environmental agencies. These agencies, in turn pass on the information to regional and national EPA offices. This regulation is governed by the Resource Conservation and Recovery Act (RCRA), as amended by the Hazardous and Solid Waste Amendments of 1984. (Excerpted from <http://www.epa.gov/enviro/html/rcris/index.html>)

*Process Step:*

*Process Description:* Feature service created

*Spatial Data Organization Information:*

*Direct Spatial Reference Method:* Vector

*Point and Vector Object Information:*

*SDTS Terms Description:*

*SDTS Point and Vector Object Type:* Entity point

*Point and Vector Object Count:* 418833

*Spatial Reference Information:*

*Vertical Coordinate System Definition:*

*Altitude System Definition:*

*Altitude Resolution:* 1.000000

*Altitude Encoding Method:* Explicit elevation coordinate included with horizontal coordinates

*Horizontal Coordinate System Definition:*

*Geographic:*

*Latitude Resolution:* 0.000001

*Longitude Resolution:* 0.000001

*Geographic Coordinate Units:* Decimal degrees

*Geodetic Model:*

*Horizontal Datum Name:* North American Datum of 1983

*Ellipsoid Name:* Geodetic Reference System 1980

*Semi-major Axis:* 6378137.000000

*Denominator of Flattening Ratio:* 298.257222

*Entity and Attribute Information:*

*Detailed Description:*

*Entity Type:*

*Entity Type Label:* FRS\_INTEREST\_RCRA\_ACTIVE

*Entity Type Definition:* Attribute table describes point features

*Entity Type Definition Source:* ESRI

*Overview Description:*

*Entity and Attribute Overview:* Attribute information is derived from FRS database owners and reference material. For additional information regarding attributes listed in this metadata record, please visit the FRS documentation page <http://www.epa.gov/enviro/html/fii/documentation.html>

*Entity and Attribute Detail Citation:* The following sources were used to derive the attribute information presented in the attribute detailed citation EPA FRS Data Dictionary; FRS Development Team, April 1999; FRS Quality Plan, Version 1.1, January 25, 2008, [http://www.epa.gov/enviro/html/frs\\_demo/FRS\\_Quality\\_Plan.pdf](http://www.epa.gov/enviro/html/frs_demo/FRS_Quality_Plan.pdf)

*Distribution Information:*

*Resource Description:* Live Data and Maps

*Distribution Liability:* All systems made available through this service are publicly accessible excluding RMP information. Although these data have been processed successfully on a computer system at the Environmental Protection Agency, no warranty expressed or implied is made regarding the accuracy or utility of the data on any other system or for general or scientific purposes, nor shall the act of distribution constitute any such warranty. It is strongly recommended that careful attention be paid to the contents of the metadata file associated with these data to evaluate data set limitations, restrictions or intended use. The U.S. Environmental Protection Agency shall not be held liable for improper or incorrect use of the data described and/or contained herein.

*Distributor:*

*Contact Information:*

*Contact Organization Primary:*

*Contact Organization:* U.S. Environmental Protection Agency, Headquarters

*Contact Person:* David Smith

*Contact Position:* FRS Project Manager

*Contact Address:*

*Address Type:* mailing and physical address

*Address:* 1200 Pennsylvania Ave, NW

*City:* Washington

*State or Province:* DC

*Postal Code:* 20460

*Contact Voice Telephone:* (202) 566-0797

*Contact Electronic Mail Address:* [smith.davidg@epa.gov](mailto:smith.davidg@epa.gov)

*Contact Instructions:* <http://www.epa.gov/>

*Metadata Reference Information:*

*Metadata Date:* 20121010

*Metadata Future Review Date:* 20161010

*Metadata Standard Name:* FGDC Content Standards for Digital Geospatial Metadata

*Metadata Standard Version:* FGDC-STD-001-1998

*Metadata Time Convention:* local time

*Metadata Extensions:*

*Online Linkage:* <http://www.esri.com/metadata/esriprof80.html>

*Profile Name:* ESRI Metadata Profile

*Metadata Contact:*

*Contact Information:*

*Contact Organization Primary:*

*Contact Organization:* U.S. Environmental Protection Agency, Research Triangle Park

*Contact Person:* EPA GIS Agency Central Support

*Contact Position:* OEI RTP NCC GIS

*Contact Address:*

*Address Type:* mailing and physical address

*Address:* USEPA Mailroom N127-02

*City:* Research Triangle Park

*State or Province:* NC

*Postal Code:* 27711

*Contact Voice Telephone:* 919-767-7493

*Contact Electronic Mail Address:* [esisupport@epa.gov](mailto:esisupport@epa.gov)

*Contact Instructions:* <http://intranet.epa.gov/rtpgis>

### **EPA Facility Registry Service (FRS): RCRA\_INACTIVE**

*Identification Information:*

*Citation:*

*Citation Information:*

*Originator:* United States Environmental Protection Agency, Office of Environmental Information

*Publication Date:* 20141022

*Title:* EPA Facility Registry Service (FRS): RCRA\_INACTIVE

*Geospatial Data Presentation Form:* vector digital data

*Publication Information:*

*Publication Place:* Washington, DC

*Publisher:* U.S. Environmental Protection Agency

*Online Linkage:* [http://geodata.epa.gov/arcgis/rest/services/OEI/FRS\\_INTERESTS/MapServer](http://geodata.epa.gov/arcgis/rest/services/OEI/FRS_INTERESTS/MapServer)

*Online Linkage:* <https://edg.epa.gov/clipship/>

*Description:*

*Abstract:* This web feature service contains location and facility identification information from EPA's Facility Registry Service (FRS) for the subset of hazardous waste facilities that link to the Resource Conservation and Recovery Act Information System (RCRAInfo). EPA's comprehensive information system in support of the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous

and Solid Waste Amendments (HSWA) of 1984, RCRAInfo tracks many types of information about generators, transporters, treaters, storers, and disposers of hazardous waste. FRS identifies and geospatially locates facilities, sites or places subject to environmental regulations or of environmental interest. Using vigorous verification and data management procedures, FRS integrates facility data from EPA's national program systems, other federal agencies, and State and tribal master facility records and provides EPA with a centrally managed, single source of comprehensive and authoritative information on facilities. This data set contains the subset of FRS integrated facilities that link to inactive RCRAInfo hazardous waste facilities once the RCRAInfo data has been integrated into the FRS database. Additional information on FRS is available at the EPA website <http://www.epa.gov/enviro/html/fii/index.html>.

*Purpose:* The purpose of this web feature service is to provide users with access to integrated facility information from FRS, limited to the subset of hazardous waste facilities that link to the Resource Conservation and Recovery Act Information System (RCRAInfo).

*Supplemental Information:* This is an EPA-Produced Data Set. This data set is one in a series of Image and Feature Services published by USEPA. Additional services can be found at <https://edg.epa.gov/>

*Time Period of Content:*

*Currentness Reference:* Publication date

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*Progress:* Complete

*Maintenance and Update Frequency:* Monthly

*Access Constraints:* None.

*Use Constraints:* None. Please check sources, scale, accuracy, currentness and other available information. Please confirm that you are using the most recent copy of both data and metadata.

Acknowledgement of the EPA would be appreciated.

*Native Data Set Environment:* Microsoft Windows XP Version 5.1 (Build 2600) Service Pack 3; ESRI ArcCatalog 9.3.1.3000

*Security Information:*

*Security Classification System:* FIPS Pub 199

*Security Classification:* No Confidentiality

*Security Handling Description:* Standard Technical Controls

*Point of Contact:*

*Contact Information:*

*Contact Organization Primary:*

*Contact Organization:* U.S. Environmental Protection Agency, Headquarters

*Contact Person:* David Smith

*Contact Position:* FRS Project Manager

*Contact Address:*

*Address Type:* mailing and physical address

*Address:* 1200 Pennsylvania Ave, NW

*City:* Washington



*State or Province:* DC

*Postal Code:* 20460

*Contact Voice Telephone:* (202) 566-0797

*Contact Electronic Mail Address:* smith.davidg@epa.gov

*Contact Instructions:* <http://www.epa.gov/>

*Data Quality Information:*

*Logical Consistency Report:* Locations are tested and reported individually

*Completeness Report:* Completeness of the data set varies for individual features.

*Positional Accuracy:*

*Horizontal Positional Accuracy:*

*Horizontal Positional Accuracy Report:* FRS uses a best-pick algorithm to provide horizontal positional information. This assigns the latitude and longitude with the best accuracy value to each facility. Because information in FRS is collected across numerous states and programs, positional accuracy for the data set varies for each individual feature and is stored on a record-level basis. Overall horizontal positional accuracy for the entire data set fluctuates as new information is received and is not estimated for the entire data set within this record. For more information on accuracy of FRS locations, visit <http://www.epa.gov/frs/index.htm>.

*Lineage:*

*Source Information:*

*Source Citation Abbreviation:* RCRAINFO

*Source Contribution:* Hazardous waste information is contained in the Resource Conservation and Recovery Act Information (RCRAInfo), a national program management and inventory system about hazardous waste handlers. In general, all generators, transporters, treaters, storers, and disposers of hazardous waste are required to provide information about their activities to state environmental agencies. These agencies, in turn pass on the information to regional and national EPA offices. This regulation is governed by the Resource Conservation and Recovery Act (RCRA), as amended by the Hazardous and Solid Waste Amendments of 1984. (Excerpted from <http://www.epa.gov/enviro/html/rcris/index.html>)

*Process Step:*

*Process Description:* Feature service Created

*Spatial Data Organization Information:*

*Direct Spatial Reference Method:* Vector

*Point and Vector Object Information:*

*SDTS Terms Description:*

*SDTS Point and Vector Object Type:* Entity point

*Point and Vector Object Count:* 304249

*Spatial Reference Information:*

*Vertical Coordinate System Definition:*

*Altitude System Definition:*

*Altitude Resolution:* 1.000000

*Altitude Encoding Method:* Explicit elevation coordinate included with horizontal coordinates

*Horizontal Coordinate System Definition:*

*Geographic:*

*Latitude Resolution:* 0.000001

*Longitude Resolution:* 0.000001

*Geographic Coordinate Units:* Decimal degrees

*Geodetic Model:*

*Horizontal Datum Name:* North American Datum of 1983

*Ellipsoid Name:* Geodetic Reference System 1980

*Semi-major Axis:* 6378137.000000

*Denominator of Flattening Ratio:* 298.257222

*Entity and Attribute Information:*

*Detailed Description:*

*Entity Type:*

*Entity Type Label:* FRS\_INTEREST\_RCRA\_INACTIVE

*Entity Type Definition:* Attribute table describes point features

*Entity Type Definition Source:* ESRI

*Overview Description:*

*Entity and Attribute Overview:* Attribute information is derived from FRS database owners and reference material. For additional information regarding attributes listed in this metadata record, please visit the FRS documentation page <http://www.epa.gov/enviro/html/fii/documentation.html>

*Entity and Attribute Detail Citation:* The following sources were used to derive the attribute information presented in the attribute detailed citation EPA FRS Data Dictionary; FRS Development Team, April 1999; FRS Quality Plan, Version 1.1, January 25, 2008, [http://www.epa.gov/enviro/html/frs\\_demo/FRS\\_Quality\\_Plan.pdf](http://www.epa.gov/enviro/html/frs_demo/FRS_Quality_Plan.pdf)

*Distribution Information:*

*Resource Description:* Live Data and Maps

*Distribution Liability:* All systems made available through this service are publicly accessible excluding RMP information. Although these data have been processed successfully on a computer system at the Environmental Protection Agency, no warranty expressed or implied is made regarding the accuracy or utility of the data on any other system or for general or scientific purposes, nor shall the act of distribution constitute any such warranty. It is strongly recommended that careful attention be paid to the contents of the metadata file associated with these data to evaluate data set limitations, restrictions or intended use. The U.S. Environmental Protection Agency shall not be held liable for improper or incorrect use of the data described and/or contained herein.

*Distributor:*

*Contact Information:*

*Contact Organization Primary:*

*Contact Organization:* U.S. Environmental Protection Agency, Headquarters

*Contact Person:* David Smith

*Contact Position:* FRS Project Manager

*Contact Address:*

*Address Type:* mailing and physical address

*Address:* 1200 Pennsylvania Ave, NW

*City:* Washington  
*State or Province:* DC  
*Postal Code:* 20460  
*Contact Voice Telephone:* (202) 566-0797  
*Contact Electronic Mail Address:* smith.davidg@epa.gov  
*Contact Instructions:* <http://www.epa.gov/>  
*Metadata Reference Information:*  
*Metadata Date:* 20121010  
*Metadata Future Review Date:* 20161010  
*Metadata Standard Name:* FGDC Content Standards for Digital Geospatial Metadata  
*Metadata Standard Version:* FGDC-STD-001-1998  
*Metadata Time Convention:* local time  
*Metadata Extensions:*  
*Online Linkage:* <http://www.esri.com/metadata/esriprof80.html>  
*Profile Name:* ESRI Metadata Profile  
*Metadata Contact:*  
*Contact Information:*  
*Contact Organization Primary:*  
*Contact Organization:* U.S. Environmental Protection Agency, Research Triangle Park  
*Contact Person:* EPA GIS Agency Central Support  
*Contact Position:* OEI RTP NCC GIS  
*Contact Address:*  
*Address Type:* mailing and physical address  
*Address:* USEPA Mailroom N127-02  
*City:* Research Triangle Park  
*State or Province:* NC  
*Postal Code:* 27711  
*Contact Voice Telephone:* 919-767-7493  
*Contact Electronic Mail Address:* esrisupport@epa.gov  
*Contact Instructions:* <http://intranet.epa.gov/rtpgis>

## Group - MS4

Properties Covered:

1. Municipal Separate Storm Sewer Systems (MS4s)

Geographic Extent Note: Property includes AK/HI\*/PR/VI

\*EPA Waterscape base geography for Hawaii is not part of the Watershed Boundary Dataset used for other states ([Source](#)). The watersheds used to score Hawaii's properties are used by the Hawaii Department of Health state water quality agency. They were developed for The Commission on Water Resources Management, a state agency within the State Department of Land and Natural Resources that oversees water resource quantity, allocation, etc. and were obtained from Hudson Slay, U.S. EPA, Region 9-Pacific Islands Contact Office, 2/12/2015.

Description: State HUC12s ranked based on percent MS4 area.

Scoring Methodology: State HUC12 scores are not normalized by state. Intrinsic scoring as follows:

Less than 30% MS4 overlap = 2 (class 1)

Greater than or equal to 30% and less than 90% MS4 overlap = 6 (class 2)

Greater than or equal to 90% MS4 overlap = 10 (class 3)

Scoring Note: Defined Class 3 as State HUC12s with 90% or greater MS4 area (2,502 State HUC12s).

After removing the records in Class 3, 8,494 State HUC12s remain. The bottom 2/3 of these (5,719 State HUC12s) contain up to 30% MS4 area. The remaining 1/3 of these (2,775 State HUC12s) contain between 30-90% MS4 area.

Process Details:

1. Intersect MS4s and State HUC 12s
2. Calculate Percent MS4 within each State HUC 12

Download Date: 6/6/2014

Source: Holly Galavotti (US EPA) [galavotti.holly@epa.gov](mailto:galavotti.holly@epa.gov), 202-564-1489

Metadata: (Full metadata not available)

This document details the procedures that were used to create GIS layers of the MS4 Phase I and Phase II MS4 areas across the country. In addition, combined sewer systems (CSS) were also included where data was available, primarily in EPA Region III.

The MS4 layers (Phase I, II, & CSS) are based on lists of MS4s provided to EPA by the States, reviews of state NPDES stormwater websites, and review of Phase I and Phase II MS4 permits.

In general, the Phase I MS4 permit coverage includes the entire jurisdiction for the cities and counties designated for coverage. The Phase II MS4 permit coverage is based on the 2000 Census urbanized areas, with adjustments made based on information specific to each state. For example, some states permitted entire cities if only a portion of the city was within the urbanized area, and other states

permitted entire jurisdictions outside of urbanized areas. The following attachment describes how the Phase I and Phase II MS4 GIS layers were created for each state.

The 2010 Census urbanized area data was released as Tetra Tech was developing the MS4 maps. Tetra Tech added a third layer to identify as “Phase II New” those areas in the 2010 Census urbanized area that are not already included in Phase I or Phase II areas.

The base layers used for the MS4 mapping included shapefiles from the U.S. Census Bureau downloaded from: [http://www.census.gov/geo/www/cob/bdy\\_files.html](http://www.census.gov/geo/www/cob/bdy_files.html). Boundary files used included the 2000 incorporated places/census designated places (the 2010 place later was not available when this project started) and the 2000/2010 urban areas.

- tl\_2009\_us\_county00
  - o <http://www2.census.gov/cgi-bin/shapefiles2009/national-files>
- tl\_2010\_place00
  - o <http://www.census.gov/cgi-bin/geo/shapefiles2010/layers.cgi>
- tl\_2009\_cousub00\_townships
  - o <http://www2.census.gov/cgi-bin/shapefiles2009/state-files?state=42>

The Census place layer does not include township boundaries, which are considered “sub-county” units of government. Because some states permit townships as MS4s, Tetra Tech also included township boundary information for about 8 states. Township data from several states was not available from the Census and was downloaded from individual state websites:

## Group – EPA Grants Reporting and Tracking System (GRTS)

Properties Covered:

1. GRTS project drainage areas

Geographic Extent Note: Property includes AK/HI\*/PR/VI

\*EPA Waterscape base geography for Hawaii is not part of the Watershed Boundary Dataset used for other states ([Source](#)). The watersheds used to score Hawaii’s properties are used by the Hawaii Department of Health state water quality agency. They were developed for The Commission on Water Resources Management, a state agency within the State Department of Land and Natural Resources that oversees water resource quantity, allocation, etc. and were obtained from Hudson Slay, U.S. EPA, Region 9-Pacific Islands Contact Office, 2/12/2015.

Property Note: GRTS data is comprised of two main types. “End Data” is the hydrography affected by GRTS projects and “User Data” is project location information entered into the GRTS systems by the user community. Each data type is comprised of multiple geometry types.

Description: State HUC12s ranked based on the proximity of GRTS projects and/or NHD features impacted by GRTS projects.

Scoring Methodology: Scores are not normalized by state. State HUC12s containing GRTS projects and/or NHD features impacted by GRTS projects are scored “10” and State HUC12s that touch State HUC12s with a score of “10”, are scored “5”.

Process Details:

1. Select State HUC12s intersected by GRTS data

Procedures used to select State HUC12s intersected by each GRTS data type:

GRTS End Data Points:

-Spatial Join State HUC12 values to Point features

GRTS End Data Lines:

-Intersect GRTS features with State HUC12s

-Remove any GRTS/StHUC12 intersections under 50 meters

GRTS End Data Polygons (crossing State HUC12s):

-Intersect GRTS features with State HUC12s

-Remove any GRTS/State HUC12 intersections under 2,500 square meters

GRTS End Data Polygons (completely inside State HUC12s):

-Spatial Join State HUC12s values to GRTS features

GRTS User Data Points:

-Spatial Join State HUC12 values to GRTS features

GRTS User Data Start/End Points:

- Spatial Join State HUC12s values to GRTS features

GRTS User Data Polygons – Digitized:

- Buffer by -75 meters

- Select State HUC12s using the buffered polygons (Note: Procedure differs for Hawaii due to the implementation of non-HUC12 based watersheds. Due to scale inconsistencies between the HUC12s and the Hawaii supplied watersheds, a manual approach was used in order to avoid false selection of neighboring watersheds.)

- Find original GRTS features that didn't get buffered due to their small size.

- Spatial Join the State HUC12 values to these remaining GRTS features

GRTS User Data Polygons-Watershed Based:

- Watershed Based list of GRTS projects and HUC 12s from GRTS system (based on previous version of WBD)

- HUC12s included based on the CAC value (Coefficient of Areal Correspondence) for each pair of 'common' HUC12s in the two WBD versions. CAC is computed as the Intersection area (between the two features with a common ID) and the Union area (of the same two features). This measures the overall areal correspondence between the two versions of the same feature. Any features with a CAC 99% or higher are considered a direct match (for the purposes of this property) and the HUC12 is included.

- Intersect the unmatched HUC12s with the previous WBD HUC12s to find pairs of HUC12s with high intersection percent (50% or greater). Transfer IDs from one HUC12 dataset to the other for these pairs. Perform a CAC procedure for these features. This is referred to as a 'location-based CAC'. HUC12s scoring 99% or higher are also considered direct matches and these HUC12s are included.

Download Date: 10/10/2014

Source: [GRTS Homepage](#)

U.S. Environmental Protection Agency, Office of Water. 20140506. Non-Point Source Clean Water Act Section 319 Projects. 20140620. Washington, DC. U.S. Environmental Protection Agency

Metadata:

Abstract:

This dataset consists of non-point source (NPS) projects by grant number and project number as reported into the Grants Reporting and Tracking System (GRTS). The projects referenced are relevant to the EPA Office of Water (OW) NPS 319 program. The projects are administered by State environmental agencies, with the assistance of local partners and federal grant funding from the Environmental Protection Agency, with the goal of reducing water pollution from nonpoint (diffuse) sources, such as: excess fertilizers, herbicides and insecticides from agricultural lands; bacteria and nutrients from livestock, pet wastes and faulty septic systems; sediment from eroding streambanks; oil, grease and toxic chemicals from urban runoff; and acid drainage from abandoned mines. For more information about nonpoint source pollution, please visit: [www.epa.gov/nps](http://www.epa.gov/nps). Under Clean Water Act Section 319(h), EPA awards grants for implementation of state NPS management programs. EPA collects information about these grant projects in their Grants Reporting and Tracking System (GRTS). State grant recipients are required to report annually in GRTS their progress in meeting milestones, including reductions of

NPS pollutant loadings and on improvements to water quality achieved by implementing NPS pollution control practices. For more information about GRTS, please visit: <http://iaspub.epa.gov/grts>. This dataset can be used as a representation of projects receiving federal 319 program funding as reported to EPA by State NPS Program managers.

Supplemental Information:

State 319 grant recipients have several options for mapping their NPS implementation projects in GRTS. These project locations are called "drainage areas" in GRTS. Because the scale of implementation varies by project, a GRTS drainage area can range in size from an entire watershed to the application area of an individual best management practice (such as a green roof on a building). Projects can have multiple drainage area locations.

November 2014

Publication date

In work

Continuously updated

Bounding:

-123

-68

49

27

Keywords:

None

GRTS

319 Grants Reporting and Tracking System

Nonpoint source

map service

waters10

EPA

Theme:

ISO 19115 Topic Category

environment

inland Waters

Place:

None

US

National

Use Constraints:

These are NPS projects by grant number and project number referenced to 12-digit hydrologic subwatersheds (HUC12s). The actual GRTS project attributes reside in tables in the GRTS business database. Please note the following constraints when using these data:



(1) Attribute records do not equate to number of projects. The records represent each unique combination of Grant Number, Project Number, and HUC12 identifier. There can be many HUC12s per project, and conversely many projects per HUC12.

(2) Blank or null values do not necessarily indicate data gaps. Not all fields are required. Review the attribute definitions for each field.

(3) Mapping and indexing methods vary, based on the spatial extent and nature of the project, or State-wide SOPs.

(4) Data quality, accuracy and completeness varies as the GRTS projects are continuously updated. This dataset represents EPA's best available data as of the referenced time period.

Contact Person:

Meghan Klasic  
US EPA Headquarters  
mailing address  
1200 Pennsylvania Avenue, NW  
Washington  
DC  
20460  
202-564-8221  
Klasic.Meghan@epamail.epa.gov

FIPS Pub 199  
No Confidentiality  
Standard Technical Controls

Not presently available  
Not presently available

GRTS Program Attributes:  
GRTS Attribute Data

DA\_SEQ - The unique internal system identifier of the project drainage area. This is important to associate with previous HUC12-based analysis results performed for this application.

1  
999999999999

Meghan Klasic  
US EPA Headquarters  
1200 Pennsylvania Avenue, NW  
Washington  
DC  
20460  
202-564-8221  
Klasic.Meghan@epamail.epa.gov

Live Data and Maps

**Distribution Liability:**

Although these data have been processed successfully on a computer system at the Environmental Protection Agency, no warranty expressed or implied is made regarding the accuracy or utility of the data on any other system or for general or scientific purposes, nor shall the act of distribution constitute any such warranty. It is strongly recommended that careful attention be paid to the contents of the metadata file associated with these data to evaluate data set limitations, restrictions or intended use. The U.S. Environmental Protection Agency shall not be held liable for improper or incorrect use of the data described and/or contained herein.

20100108

20111101

FGDC Content Standards for Digital Geospatial Metadata  
FGDC-STD-001-1998

## Group – Dischargers (DMR)

### Properties Covered:

1. Mass Nitrogen
2. Mass Phosphorus
3. Mass Organic Enrichment
4. Mass Solids
5. Toxic Equivalent Metals
6. Mass Mercury
7. Mass Copper
8. Mass Selenium
9. Mass Zinc
10. Mass Iron

Geographic Extent Note: Property includes AK/HI\*/PR/VI

\*EPA Waterscape base geography for Hawaii is not part of the Watershed Boundary Dataset used for other states ([Source](#)). The watersheds used to score Hawaii's properties are used by the Hawaii Department of Health state water quality agency. They were developed for The Commission on Water Resources Management, a state agency within the State Department of Land and Natural Resources that oversees water resource quantity, allocation, etc. and were obtained from Hudson Slay, U.S. EPA, Region 9-Pacific Islands Contact Office, 2/12/2015.

Description: State HUC12s ranked, by state, based on the total mass discharged within.

Scoring Methodology: CONUS State HUC12s are placed into deciles (ten groups with equal amounts of features) according to their rank within the state. For example, features in the bottom 10% receive a score of "1" features in the next 10% receive a score of "2" and so on. Due to a limited number of HUC12s with discharge data in OCONUS states/territories (AK, HI, PR, VI), a three-tiered scoring system was used, where scores of "2", "6", and "10" represent the lowest third, middle third, and highest third-ranked HUC12s, respectively, within each state. In cases where an individual state has 6 or fewer HUC12s with data, the following scoring systems were manually applied:

#### **Hawaii**

Iron: 10 (1 watershed)

Selenium: 5/10

Mercury: 5/10

#### **Alaska**

Iron: 5/10

Selenium: 5/10

Mercury: 5/10

#### **Virgin Islands**

Nitrogen: 5/10

Phosphorus: 10

Organics: 2/6/10

Metals: 5/10

Copper: 10

Process Details:

1. Spatially Join the NHDPlus V2 State HUC12s to the DMR points
2. Summarize the HUC 12 field, summing the values for Mass Nitrogen
3. Repeat Steps 1-2 for the all DMR discharge types

Download Date: 7/17/2014

Source: [Link](#)

ICIS-NPDES, U.S. Environmental Protection Agency.

Metadata:

Note: The tool uses discharge monitoring report (DMR) data from ICIS-NPDES to calculate pollutant discharge amounts. EPA has verified the accuracy of the tool's calculations. EPA has also performed a limited review of the underlying data that has focused on facilities with the largest amounts of pollutant discharges. Due to the large amount of DMR data, additional errors exist in ICIS-NPDES.

Overview:

The Discharge Monitoring Report (DMR) Pollutant Loading Tool is designed to help you determine **who is discharging, what pollutants they are discharging and how much, and where they are discharging.**

The tool calculates pollutant loadings from permit and DMR data from EPA's Integrated Compliance Information System for the National Pollutant Discharge Elimination System (ICIS-NPDES). Data are available from the year 2007 to the present. Pollutant loadings are presented as pounds per year and as toxic-weighted pounds per year to account for variations in toxicity among pollutants. The tool ranks dischargers, industries, and watersheds based on pollutant mass and toxicity, and presents "top ten" lists to help you determine which discharges are important, which facilities and industries are producing these discharges, and which watersheds are impacted.

Data Sources

<http://cfpub.epa.gov/dmr/about-the-data.cfm#source>

The Loading Tool uses discharge monitoring and permit data from **Integrated Compliance Information System - National Pollutant Discharge Elimination System (ICIS-NPDES)**. ICIS-NPDES is a database that automates entering, updating, and retrieving discharge monitoring and permit data.

Dischargers submit discharge monitoring data to their permitting authority using discharge monitoring report (DMR) forms. The permitting authority then enters these data into ICIS-NPDES and checks whether the discharger is in compliance with the NPDES permit requirements. Facilities report pollutant discharge monitoring data in their DMR as mass-based quantities (e.g., pounds per day) and/or concentrations (e.g., mg/L); however, discharges are reported using a wide variety of units.

Permit data include NPDES permit limits for water quality parameters (e.g., dissolved oxygen and temperature), specific chemicals (e.g., phenol), bulk parameters (e.g., biochemical oxygen demand), and flow. The permitting authority enters these data into ICIS-NPDES. ICIS-NPDES also include information on the facility's permit requirements, such as monitoring frequency. The ICIS-NPDES database:

- Is national in scope, including data from all 50 states and 21 U.S. territories and tribes;
- Contains discharge data that facilities determine through effluent chemical analyses and metered flow; and
- Include information for facilities in all point source categories that discharge directly to receiving streams.

The tool also includes wastewater pollutant discharge data from EPA’s [Toxics Release Inventory \(TRI\)](#). Data is available for the years 2007 through 2012. Users can search TRI data to find the facilities with the largest pollutant discharges to surface waters or sewage treatment plants (a.k.a. Publicly-Owned Treatment Works or “POTWs”). Users can also compare the DMR data search results against TRI data search results and vice versa. The tool clearly labels the source of data when displaying search results but does not mix TRI or DMR data when calculating pollutant discharges. See the [Basics of TRI Reporting](#) and [Factors to Consider When Using TRI Data](#) for more information.

Other data sources used by the Loading Tool include:

- Watershed Assessment Tracking and Environmental Results (WATERS) Web services for retrieving information about receiving waterbodies. WATERS derives some its data from EPA’s Assessment, TMDL Tracking and ImplementatioN System (ATTAINS) database, [USGS Geographic Names Information System \(GNIS\)](#), and the [USGS National Hydrography Dataset \(NHD\)](#);
- [Clean Watershed Needs Survey \(CWNS\)](#) for providing information about treatment technologies in place at municipal wastewater treatment plants (a.k.a. Publicly-Owned Treatment Plants or POTWs);
- EPA’s [Facility Registry System \(FRS\)](#) for providing facility location information and linking ICIS-NPDES facilities to other EPA programs, such as the Toxics Release Inventory (TRI);
- EPA’s [Substance Registry Services \(SRS\)](#), which is the Agency’s central system for information about substances that are tracked or regulated by EPA or other sources. It is the authoritative resource for basic information about chemicals, biological organisms, and other substances of interest to EPA and its state and tribal partners; and
- EPA’s [STORET \(STOrage and RETrieval\) Data Warehouse](#), which is a repository for water quality, biological, and physical data.

**DMR Loading Tool Database Sources and Updates**

Data Source	Contact	Process	Update Schedule
Integrated Compliance Information System - National Pollutant Discharge Elimination System (ICIS-NPDES)	EPA/OECA	Prior to 2014, EPA manually pulled data from ICIS-NPDES on an annual basis and made monthly error correction updates. In August 2014 EPA began using a continuous process to capture changes in ICIS-NPDES (inserts, updates, deletes). EPA also automatically calculates pollutant discharge estimates on a weekly schedule.	Changes in ICIS-NPDES data are captured continuously and compiled on Friday at 10 am. The Loading Tool makes these data and the related pollutant loading estimates available on the following Monday, no later than 5 pm.

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**Data Scope and Limitations**

Before you begin your searches, there are some things you should know about the scope and limitations of the pollutant loadings calculated by the Loading Tool:

**DMR Data**

**Facility Universe**

While the Loading Tool includes discharges for more than 60,000 facilities, it is not a complete inventory of all discharges permitted under the Clean Water Act.

Although the Clean Water Act requires all point source dischargers to obtain a NPDES permit and monitor their wastewater, not all facility, permit, or discharge monitoring data are uploaded into ICIS-

NPDES. EPA places greater priority on major facilities, and requires authorized states to provide more information about the compliance status of these dischargers. Specifically, EPA policy requires the permitting authority to enter facility, permit, and DMR information from “major” dischargers into either ICIS-NPDES. EPA policy requires a more limited set of data be shared with EPA through data entry into [ICIS-NPDES \(PDF\)](#) (14 pp, 4.6 MB) for “non-major” (or “minor”) facilities. Many authorized states also transmit facility, permit, and DMR data for non-major dischargers to the ICIS-NPDES databases. The links below detail the amount of DMR data that the states share with EPA’s ICIS-NPDES database. These data come from [EPA’s State Review Framework](#), which allows EPA to identify recommendations for improvement to ensure fair and consistent enforcement and compliance programs across the states. There are also differences between the states on sharing facility level data with EPA’s ICIS-NPDES database for general permit covered facilities (e.g., oil and gas extraction facilities, construction stormwater sites). EPA and states issue general permits to increase the efficiency of the permit program as multiple similar facilities can be regulated under one permit.

Use the [State Statistics and Loadings Search](#) to download state statistics and loadings for each year. The Loading Tool contains information for industrial and municipal point source dischargers. Other types of Clean Water Act releases that are not available in the Loading Tool include:

- Wastewater releases from industrial facilities that are connected to a publicly-owned treatment works (POTW) sewerage system, regulated through the [CWA Pretreatment Program](#);
- Biosolids monitoring data, regulated through the [CWA Biosolids Program](#);
- Discharges related to wet-weather events, such as stormwater from municipal separate storm sewer systems (MS4s), stormwater from industrial facilities, discharges from construction activities, combined sewer overflows, sanitary sewer overflows, and concentrated animal feeding operations (CAFOs).

### **Pollutant Universe**

The Loading Tool includes approximately 1,000 pollutant parameters including specific chemicals (e.g., phenol), bulk parameters (e.g., biochemical oxygen demand), temperature, and wastewater flow. However, these pollutants do not account for all pollutants discharged to U.S. waters.

- ICIS-NPDES only includes information about discharges of pollutants that a facility is required by permit to monitor; facilities are not required to monitor or report all pollutants they actually discharge.
- Discharge data are entered into ICIS-NPDES using a variety of measurement units. The Loading Tool can only calculate mass discharges for pollutants that are measured either as mass quantities or concentrations. Therefore some pollutants, such as toxicity parameters measured as percent, are excluded from the Loading Tool. Further, the Loading Tool cannot calculate a load for concentration measurements if a wastewater flow measurement is not provided.

Additionally, EPA policy requirement requires a more limited set of facility, permit and DMR data be shared with EPA through data entry into ICIS-NPDES for non-major facilities. Data sharing for these non-major facilities varies across the different state NPDES permit programs. Consequently, the Loading Tool will not identify all non-major facilities if you limit a search to a particular pollutant. The Loading Tool uses permit data to count facilities when the user searches on a particular pollutant.

### **Matching Facilities to Watersheds**

The Loading Tool matches facilities to receiving watersheds based on a facility’s latitude and longitude coordinates and watershed spatial data in the [Natural Resources Conservation Service’s Watershed](#)

[Boundary Dataset](#). The Loading Tool cannot establish a match between a facility and a watershed if either:

- The facility does not have latitude or longitude coordinates; or
- There are no spatial data for the receiving watershed.

The Loading Tool uses names from the [USGS Geographic Names Information System \(GNIS\)](#). The GNIS is closely integrated with the [National Hydrography Dataset \(NHD\)](#), which makes these data more useful for plotting on maps and for watershed modeling and other research. Not all waterbodies receiving wastewater discharges have names in the GNIS and the not all names in the GNIS match the names that facilities provide in their NPDES permit application.

See [Watershed Data](#) for further information about how the Loading Tool matches DMR facilities to receiving watersheds.

#### **Data Quality**

DMR data may be entered into the ICIS-NPDES database manually, which can lead to data-entry errors. The database supporting this online tool uses data extracts from ICIS with regular error correction updates from EPA's [Integrated Error Correction Process](#). The Integrated Error Correction Process allows EPA to track and incorporate into the Loading Tool database error corrections submitted by the public. EPA also works with states to identify any error corrections that they make to their data outside of the Integrated Error Correction Process.

#### **Intermittent Dischargers**

Some facilities have intermittent discharges and may have one or more outfalls that don't discharge for one or more months. ICIS-NPDES has ways of identifying when there is no discharge at a particular outfall for an entire monitoring period. In such cases, the Loading Tool does not calculate pollutant loads for these outfalls during these monitoring periods.

EPA also developed a methodology with the states to estimate intermittent discharges that occurring within a monitoring period (e.g., there is a discharge from the outfall but it only occurs two days out of the monthly monitoring period). Specifically, the Loading Tool uses three ICIS-NPDES "Duration of Discharge" codes for identifying these intermittent dischargers: 50037, 82517, and 81381. The Loading Tool will automatically adjust the pollutant loading calculation such that the calculation only estimates pollutant discharges for the time when the outfall is discharging (e.g., two days in the month instead of the entire month).

However, there is a limitation with ICIS-NPDES data in that not all NPDES permits require permittees to submit these Duration of Discharge codes when there are intermittent discharges that occur within a monitoring period. Consequently, the tool may overestimate pollutant discharges for these intermittent dischargers that do not report these Duration of Discharge codes. NPDES permittees with intermittent discharges are encouraged to engage with their permit writers to add one of these Duration of Discharge codes to their DMR. NPDES permittees may also contact EPA ([waterloadings@epa.gov](mailto:waterloadings@epa.gov)) if these Duration of Discharge codes are not yet in their DMR.

## Group - CHAT

Properties Covered:

1. Crucial Habitat Area – Class 1
2. Crucial Habitat Area – Class 2
3. Crucial Habitat Area – Class 3
4. Crucial Habitat Area – Class 4
5. Crucial Habitat Area – Class 5
6. Crucial Habitat Area – Class 6

Geographic Extent Note: Property includes only: AK/ID/KS/MT/NE/NM/NV/OR/SD/UT/WA/WY

Description: State HUC12s ranked based on the Percent area of each Crucial Habitat Area class.

Scoring Methodology: State HUC12s are placed into deciles (ten groups with equal amounts of features) according to their rank within the state. For example, features in the bottom 10% receive a score of “1” features in the next 10% receive a score of “2” and so on.

Process Details:

1. Intersect CHAT Class 1 with the State HUC12s
2. Calculate the Percent Area as ‘Intersect area’/’State HUC12 area’
3. Repeat for the remaining CHAT Classes (2-6)

Download Date: 7/29/2014

Source: [Link](#)

State Wildlife Agencies of the Western United States. West-wide Crucial Habitat Data Set. Western Governors’ Crucial Habitat Assessment Tool: Mapping Fish and Wildlife Across the West. Western Governors’ Association. Published 7/29/2014. Accessed 7/29/2014. <http://www.westgovchat.org>

Metadata: [Link](#)

[Individual State Metadata](#) (To navigate to this link from the web, visit [westgovchat.org/data/metadata](http://westgovchat.org/data/metadata), click the “State Specific Crucial Habitat Metadata” drop-down menu, and click the “compiled table download”

[Disclaimer](#)

Credits: State Wildlife Agencies of the Western United States. West-wide Crucial Habitat Data Set. Western Governors’ Crucial Habitat Assessment Tool: Mapping Fish and Wildlife Across the West. Western Governors’ Association. Published 7/29/2014. Accessed 7/29/2014. <http://www.westgovchat.org>

Description: The Western Governors’ Crucial Habitat Assessment Tool (CHAT), available at [westgovchat.org](http://westgovchat.org), is a non-regulatory tool that allows users to quickly identify crucial habitat in 16 Western states. The Crucial Habitat map is ranked on a relative scale of 1-6; 1 represents areas most likely to contain natural resources that contribute to crucial habitat and 6 represents areas considered



the least likely to contain those resources. Each state had the ability to rank their data using a shared framework, guidelines, and definitions established by the Western Governors' Wildlife Council. Information on the process used create the tool, as well as detailed metadata, is available at [www.westgovchat.org](http://www.westgovchat.org).

#### Additional Metadata:

**Abstract:** This dataset represents an aggregated measure of crucial habitat for species of interest to the western states' fish and wildlife management agencies. Crucial habitat describes places that are expected to contain the resources necessary for continued health of fish and wildlife populations or important ecological systems expected to provide high value for a diversity of fish and wildlife. Specifically, the Western Governors' Wildlife Council (WGWC) defined crucial habitat for fish and wildlife to include several data types and layers of information available:- Habitat for Species of Concern (SOC): terrestrial and/or aquatic- Native and Unfragmented Habitat: may include landscape condition; large natural areas; natural veg. communities; ecological systems of concern; landscape corridors; and/or freshwater integrity- Riparian and wetland habitat- Connectivity or linkage areas: wildlife corridors- Quality habitat for species of importance not already accounted for in "Habitat for SOC" States compiled data encompassing all of the above categories and then ranked areas as "crucial habitat" using a relative, six-level prioritization scheme, where 1 represents areas "most crucial," or those areas that most closely meet the definition of crucial habitat based on the WGWC definitions; and 6 represents "least crucial" areas, or those areas that least closely meet the definition of crucial habitat based on the WGWC definitions. Crucial habitat values are in no way regulatory and do not imply specific avoidance or mitigation measures for a given area. Crucial habitat values should be interpreted as the relative probability, or risk, that a high-priority species or habitat would be encountered in a given area based on the best available scientific information. The Crucial Habitat Assessment Tool (CHAT) westwide dataset is the product of coordination among state fish and wildlife agencies working under the direction and guidance of the WGA to define crucial fish and wildlife habitat more consistently across state lines. The result is intended to improve understanding of fish and wildlife habitat priorities among the states and can be useful for both state-specific and inter-state queries. The crucial habitat dataset is intended to facilitate landscape decision-making in the early stages of land use project planning, and to facilitate efforts to identify important areas for conservation using regionally consistent analyses and data definitions

**Step Description:** Individual states compiled data inputs and then ranked into prioritized crucial habitat maps under direction of each WGWC representative. The crucial habitat maps were assembled into a hexagonal grid: Either 1 square mile hexagons or 3 square mile hexagons for the conterminous western states; 10 square mile hexagons were used for Alaska. Please see the individual state metadata information provided within the CHAT website (<http://westgovchat.org/data/metadata#>) or in the excel spreadsheet accompanying the CHAT westwide dataset download. 2013-11-04

**West-wide crucial habitat mosaic:** Each state submitted their crucial habitat hexagon layer with all specific attribute fields populated for inclusion in the west-wide mosaic. Attribute columns or individual cells that were not used by a state were coded with a value of 9999 to indicate "data not available". Individual state layers were processed in ArcGIS 10.2 and "joined" by hexagon ID to a series of West-wide hexagon layers that had an attribute column relating to each specific data input theme as well as a column for each state (for example, Ter\_SOC; Intact\_LS). The data value from the state specific layer was

copied into the appropriate state attribute column in the westwide data theme layer. Once all states had been joined and their values copied, the attribute field for that theme layer was calculated as the minimum value from across all states. Using this method, each state's values were used to populate the West-wide mosaic, and cells shared along a state border were populated with the minimum of the possible inputs. Using 9999 for "no data" ensured that a value from a neighboring state would supercede this and help prevent data gaps along state borders. Cells coded as 9999 within a state represent areas of "data not available". When all West-wide data theme layers were completed, the calculated minimum value was then joined to a west-wide layer that was populated with the minimum values from each data theme layer. Two copies of this fully attributed westwide layer were then made, one to represent the viewing preferences of each state, and a second to represent the data download preferences for each state. A series of selections and recalculations were made based on the display and download preferences for each state such that if a state designated an attribute column should not be displayed (or downloaded), the attribute cells within that state were recalculated to be 9999.

Preferences were assigned to the state that occupied the center of each hexagon cell

Additional Details: Specific attribute definitions will vary by state, as every state participating in CHAT will have slight variances in how they determined specific attribute priority ranks. Each state has documented detailed, state-specific information on how each input data layer was produced and how the aggregated crucial habitat layer was produced. Information on these layers, including specific definitions for priority values and what data sources are used within each layer, can be found online (<http://westgovchat.org/data/metadata>) or in the excel file accompanying the westwide dataset download. However, basic definitions of the attributes contained in this dataset are provided here. Note that all attributes are ranked on a scale of 1-6 indicating a component of crucial habitat, where 1 represents areas "most crucial," or those areas that most closely meet the definition of crucial habitat based on the WGWC definitions; and 6 represents "least crucial" areas, or those areas that least closely meet the definition of crucial habitat based on the WGWC definitions. Values of 9999 indicate that data is unavailable for this hexagon. Common field definitions: ch\_rank (Crucial Habitat): Places that are likely to provide the natural resources important to aquatic and terrestrial wildlife, including species of concern, as well as hunting and fishing species. This is the default layer shown in the WGA CHAT online map (<http://westgovchat.org/map>). ter\_rank (Terrestrial Crucial Habitat): Places that are likely to provide the natural resources important to terrestrial wildlife species (most likely any non-fish species), including species of concern, as well as hunting and fishing species. aq\_rank (Aquatic Crucial Habitat): Places that are likely to provide the natural resources important to aquatic (primarily fish) species, including species of concern, as well as hunting and fishing species. ter\_soc (Terrestrial Species of Concern): Species of state and/or national conservation importance that occur on land. May include birds, mammals, amphibians, reptiles, insects, plants and invertebrates. aq\_soc (Aquatic Species of Concern): Species of state and/or national conservation importance that occur in water. May include native freshwater and anadromous fishes; freshwater mussels and snails; crayfish; fairy, clam or tadpole shrimps; and aquatic insects. soc (Species of Concern): Species of state and/or national conservation importance, including those vulnerable to extinction or those undergoing regional decline or other species requiring special management attention. Most states defined their Species of Concern list using State Wildlife Action Plan "Species of Greatest Conservation Need" and NatureServe conservation status rankings, and other criteria in some cases. Individual species are not depicted but the resources section

of this site contains information specific to the Greater Sage Grouse and the Lesser Prairie Chicken.

ls\_cond (Landscape Condition): A measure of land cover impacted by human activities. WGA Landscape Integrity Workgroup used a NatureServe landscape condition model to identify Large Intact Blocks and Important Connectivity Zones.

intact\_ls (Intact Landscapes, or Large Natural Areas): Large Intact Blocks or other dataset that identifies large areas of native habitat that are relatively intact or have low levels of anthropogenic impact.

nat\_veg (Natural Vegetation Communities): Dataset mapping natural vegetation communities of conservation concern, which may include clusters or patches of a natural community. States may have their own datasets mapping natural communities, or may have used the WGA Landscape Integrity Workgroups' Ecological Systems of Concern map.

ls\_corr (Landscape Corridors, or Connectivity): Landscape - scale permeability or connectivity. States may have used their own dataset mapping connectivity, or may have used the WGA Landscape Integrity Workgroup's map of Important Connectivity Zones.

ls\_merge (Landscape Condition Summary): Aggregated measure of landscape integrity data layers (for example, Large Intact Blocks; Ecological Systems of Concern; Important Connectivity Zones; etc), using the minimum criteria for an individual data layer.

fh2o\_int (Freshwater Integrity): Measure of freshwater habitat condition, typically including landscape variables and land use variables that are known to impact aquatic ecological systems.

wet\_rip (Wetland and/or Riparian Habitat Distribution): Areas that represent unique and/or sensitive environments and function to support animal and plant diversity with respect to wildlife objectives and connectivity.

spp\_corr (Species or Wildlife Corridors): Species specific analysis of connectivity, typically including important movement areas.

ter\_seri (Terrestrial Species of Economic and/or Recreational Importance): Terrestrial game species especially if habitat needs are not already covered by mapping "Species of concern".

aq\_seri (Aquatic Species of Economic and/or Recreational Importance): Sportfish, especially if habitat needs are not already covered by mapping "Species of Concern".

seri (Species of Economic and/or Recreational Importance): These may include game or sportfish species especially if habitat needs are not already covered by mapping "Species of Concern".

otherA, otherB, otherC: Additional attributes provided from state specific data sources, or analysis. Please see state specific metadata for definitions of these fields.

## Group – National Fish Habitat Action Plan (NFHAP)

Properties Covered:

1. Relative risk of fish habitat degradation.

Geographic Extent Note: Property includes AK/HI\*

\*EPA Waterscape base geography for Hawaii is not part of the Watershed Boundary Dataset used for other states ([Source](#)). The watersheds used to score Hawaii's properties are used by the Hawaii Department of Health state water quality agency. They were developed for The Commission on Water Resources Management, a state agency within the State Department of Land and Natural Resources that oversees water resource quantity, allocation, etc. and were obtained from Hudson Slay, U.S. EPA, Region 9-Pacific Islands Contact Office, 2/12/2015.

Description: State HUC12s ranked based on relative risk of fish habitat degradation.

Scoring Methodology: Source HUC12s are from 2009 WBD. Original scores 'transferred' to current HUC12s based on percent overlap. A score is directly taken in cases where the original HUC12 comprises at least half of the current HUC12. In cases no original HUC12 comprises at least half of the current HUC12, the highest class value with at least 10% overlapping area was transferred.

Scoring Note - Risks classes "2", "4", "6", "8", and "10" are to be interpreted respectively as, "very low", "low", "moderate", "high", and "very high".

Process Details:

1. Use the score from the NFHAP HUC12 that comprises 50% or more of the area of the NHDPlusV2 HUC12

For the remaining NHDPlus V2 HUC12 not meeting the above condition:

2. Find the highest score (2,4,6,8,10) comprising at least 10% area of the NHDPlus V2 HUC12 and assign that to the NHDPlus V2 HUC12

Download Date: 9/12/2014

Source: [Link](#)

National Fish Habitat Action Plan (NFHAP) 2010 HCI Scores and Human Disturbance Data for Conterminous United States linked to NHDPLUSV1, Department of Fisheries and Wildlife, Michigan State University, Denver, CO, 201104.

Metadata:

Department of Fisheries and Wildlife, Michigan State University

Peter C. Esselman, Dana M. Infante, Lizhu Wang, William W. Taylor, Wesley M. Daniel, Ralph Tingley, Jacqueline Fenner, Arthur Cooper, Daniel Wieferich, Darren Thornbrugh, and Jared Ross 201104

National Fish Habitat Action Plan (NFHAP) 2010 HCI Scores and Human Disturbance Data for Conterminous United States linked to NHDPLUSV1 maps and data  
Denver, CO

National Fish Habitat Action Plan (NFHAP)

DOI name: 10.5066/F7B56GN1 (<http://www.doi.org/>)

Peter C. Esselman, Dana M. Infante, Lizhu Wang, William W. Taylor, Wesley M. Daniel, Ralph Tingley, Jacqueline Fenner, Arthur Cooper, Daniel Wieferich, Darren Thornbrugh, and Jared Ross

A landscape assessment of fish habitat conditions in United States rivers and their watersheds  
maps and data

<http://fishhabitat.org/>

National Fish Habitat Action Plan (NFHAP)

<http://fishhabitat.org/>

This geodatabase contains landscape factors representing human disturbances summarized to local and network catchments of river reaches throughout the conterminous U.S. They include land uses, population density, roads, dams, mines, and point-source pollution sites. The source datasets that were compiled and attributed to catchments were identified as being: (1) meaningful for assessing fish habitat; (2) consistent across the entire study area in the way that they were assembled; (3) representative of conditions in the past 10 years, and (4) of sufficient spatial resolution that they could be used to make valid comparisons among local catchment units. In this data set, these variables are linked to the catchments of the National Hydrography Dataset Plus Version 1 (NHDPlusV1) using the COMID identifier. They can also be linked to the reaches of the NHDPlusV1 using the COMID identifier. Catchment attributes are available for both local catchments (defined as the land area draining directly to a reach; attributes begin with "L\_" prefix) and network catchments (defined by all upstream contributing catchments to the reach's outlet, including the reach's own local catchment; attributes begin with "N\_" prefix). This geodatabase also includes habitat condition scores created based on responsiveness of biological metrics to anthropogenic landscape disturbances throughout ecoregions. Separate scores were created by considering disturbances within local catchments, network catchments, and a cumulative score that accounted for the most limiting disturbance operating on a given biological metric in either local or network catchments. This assessment only scored reaches representing streams and rivers (see the process section for more details).

These data were collected for multiple purposes. First, they were gathered in support of conducting a condition assessment of fluvial waterbodies throughout the United States in support of the National Fish Habitat Action Plan (NFHAP). Second, these data were intended to be made available to NFHAP Partnerships as well as other users interested in acquiring consistently-organized information available characterizing river systems over larger regions. This work was supported by local, state, and federal partners of NFHAP, including the U.S. Fish and Wildlife Service and the U.S. Geological Survey.

Because the condition assessment was conducted over such a large geographic region, we adopted a landscape approach for assessment which assumed that anthropogenic disturbances as well as natural characteristics in the watersheds affect a given unit of habitat which in turn would affect fishes. It was necessary to use a landscape approach because landscape data are available for every location in of the United States whereas local measures of habitat or biological indicators of habitat condition are only available at a very small percentage of locations around the country.

NFHAP GIS processing methodology for the initial national assessment processing steps were used for a subset of datasets acquired for use in the initial national assessment being performed on the conterminous 48 states for NFHAP. With the exception of elevation data, processing steps used for datasets and variables supplied with the NHDPlusV1 dataset are excluded (this information is available in the NHDPlusV1 user guide and metadata). Also excluded are processing steps for datasets acquired by NFHAP, but not used in the current assessment. The modifications and manipulations made to these datasets were done to facilitate variable generation and catchment attribution. Descriptions of the process by which landscape scores were summarized are documented in (Esselman, P.C., Infante, D.M., Wang, L., Wu, D., Cooper, A.R., Taylor, W.W., 2011. An index of cumulative disturbance to river fish habitats of the conterminous United States from landscape anthropogenic activities. *Ecol. Restor.* 29, 133-151.). Additional contact information: Dana Infante, 517-432-7232, [infanted@msu.edu](mailto:infanted@msu.edu); Peter Esselman, 517-432-1927, [pce@msu.edu](mailto:pce@msu.edu).

2000

2007

publication date

Complete

Arthur Cooper

Department of Fisheries and Wildlife, Michigan State University

mailing and physical

Natural Resources, 480 Wilson Rd. Rm 13

East Lansing

MI

48824

(517) 432-8048

[coopera6@msu.edu](mailto:coopera6@msu.edu)

Funding for the development of these data tables was provided by the U.S. Fish and Wildlife Service and the U.S. Geological Survey. The following individuals were involved in data collection and analysis: Peter C. Esselman, Dana M. Infante, Lizhu Wang, William W. Taylor, Wesley M. Daniel, Ralph Tingley, Jacqueline Fenner, Arthur Cooper, Daniel Wieferich, Darren Thornbrugh, and Jared Ross.

Network catchment summaries were generated using the NHDPlus CA3T (Catchment Attribute Allocation and Accumulation Tool). The CA3T tool includes a function that calculates cumulative upstream catchment attributes for flowlines within the NHDPlus dataset.

[http://www.horizon-systems.com/NHDPlus/NHDPlusV1\\_tools.php](http://www.horizon-systems.com/NHDPlus/NHDPlusV1_tools.php)

CA3T version 1.0.0 was used develop the network catchment summaries provided in this dataset, however a newer version of CA3T can be obtained at [http://www.horizon-systems.com/NHDPlus/NHDPlusV1\\_tools.php](http://www.horizon-systems.com/NHDPlus/NHDPlusV1_tools.php).

Horizon Systems Corporation

mailing and physical

PO Box 5084

Herndon

VA  
20170  
703-471-0480

No formal attribute accuracy tests were conducted

N/A. No formal logical accuracy assessment conducted.

N/A. No formal completeness assessment conducted. See abstract and processing steps for more information.

We selected spatial datasets that represent anthropogenic disturbances to landscapes that would likely impact stream habitats. After selecting appropriate datasets for the assessment, we manipulated data to prepare for local catchment attribution. Manipulations are described in detail in the process input section but include steps such as altering spatial extent, altering coordinate system, clipping data, merging data and reclassifying data. Next data was attributed to local catchments. The results of the local catchment attribution were then input into the CA3T version 1.0.0 tool to calculate network catchment attribution. Within each of 9 aggregated Omernik (1987) ecoregions as defined by the EPA's Wadeable Streams Assessment (Paulsen et al., 2008), key biological metrics were selected following an approach to identify those metrics that were most sensitive to anthropogenic disturbance and that were widely distributed throughout ecoregions (Stoddard et al. 2008). Habitat condition scores were created based on responsiveness of biological metrics to anthropogenic landscape disturbances throughout ecoregions, and separate scores were created by considering disturbances within local catchments (LDistIndex), network catchments (NDistIndex), and a cumulative score that accounted for the most limiting disturbance operating on a given biological metric in either local or network catchments (CumDistIndex). Literature Cited Esselman, P.C., Infante, D.M., Wang, L., Wu, D., Cooper, A.R., Taylor, W.W., 2011. An index of cumulative disturbance to river fish habitats of the conterminous United States from landscape anthropogenic activities. *Ecol. Restor.* 29, 133-151. Stoddard, J.L., Herlihy, A.T., Peck, D.V., Hughes, R.M., Whittier, T.R., Tarquinio, E., 2008. A process for creating multimetric indices for large-scale aquatic surveys. *J. N. Am. Benthol. Soc.* 27, 878-891.

Multi-Resolution Land Characteristics Consortium (MRLC)

Unknown

National Land Cover Database 2001 Version 1

Spatial Data

<http://www.mrlc.gov>

Multi-Resolution Land Characteristics Consortium (MRLC)

<http://www.mrlc.gov>

Spatial Data

2001

NLCD 2001 v1

Input spatial dataset used to create urban, pasture and crops variables.

National Oceanic and Atmospheric Administration

Unknown

U.S. Population Density 2000

Spatial Data

[http://www.ngdc.noaa.gov/dmsp/download\\_sprawl.html](http://www.ngdc.noaa.gov/dmsp/download_sprawl.html)

National Oceanic and Atmospheric Administration

[http://www.ngdc.noaa.gov/dmsp/download\\_sprawl.html](http://www.ngdc.noaa.gov/dmsp/download_sprawl.html)

Spatial Data

2000

NOAA

Input spatial dataset used to create popdens variables.

U.S. Census 2000 / ESRI

2000

Census 2000 TIGER Roads

Spatial Data

[http://www.esri.com/data/download/census2000\\_tigerline/index.html](http://www.esri.com/data/download/census2000_tigerline/index.html)

U.S. Census 2000 / ESRI

[http://www.esri.com/data/download/census2000\\_tigerline/index.html](http://www.esri.com/data/download/census2000_tigerline/index.html)

Spatial Data

2000

ESRI Census

Input spatial dataset used to create roadcr and roadlen variables.

U.S. Army Corps of Engineers

Unknown

National Inventory of Dams

Spatial Data

<http://crunch.tec.army.mil/nidpublic/webpages/nid.cfm>

U.S. Army Corps of Engineers

<http://crunch.tec.army.mil/nidpublic/webpages/nid.cfm>

Spatial Data2002

2004

NID

Input spatial dataset used to create dams variables.

U.S. Geological Survey

Unknown

Active Mines and Mineral Processing Plants

Spatial Data

<http://tin.er.usgs.gov/mineplant/>

U.S. Geological Survey

<http://tin.er.usgs.gov/mineplant/>



Spatial Data  
2003

mineplant-fUS

Input spatial dataset used to create mines variables.

U.S. Environmental Protection Agency

Unknown

EPA Geospatial Data

Spatial Data

[http://www.epa.gov/enviro/geo\\_data.html](http://www.epa.gov/enviro/geo_data.html)

U.S. Environmental Protection Agency

[http://www.epa.gov/enviro/geo\\_data.html](http://www.epa.gov/enviro/geo_data.html)

Spatial Data

2007

EPA

Input spatial dataset used to create tri, npdes, and cerc variables.

National Land Cover Database 2001 Version 1: The 2001 NLCD version 1 data (30 meter resolution) was downloaded by NLCD land cover region (14 total regions for the conterminous 48 states). Image (.img) format datasets were converted to an Arc/Info grid using the IMAGEGRID command in ArcInfo Workstation: `imagegrid landcover1_3k_022007.img landcover1 # # nearest #` The regional land cover grids were created using a set of nested GRID commands in ArcInfo Workstation. The first command used was SELECTMASK, which restricted the output grid to the boundary of the CAT catchment grid for each NHDPlus region. In the original data structure, the grid value of 127 was used in place of the 'No Data' category. This value was changed to 'No Data' using the SETNULL command. If needed, the MERGE command was used to combine multiple NLCD regions to form one NHDPlus region. Below is an example of the code that was used to generate the output land cover grids: `landcov2001 = selectmask (merge (setnull(landcover1 == 127, landcover1), setnull(landcover2 == 127, landcover2), setnull(landcover3 == 127, landcover3)), cat)`

U.S. Population Density 2000: The NOAA Population Density grid (1 km spatial resolution) for the conterminous 48 states was clipped for each NHDPlus region using the ArcInfo Workstation SELECTMASK command. The cell size, window, and select mask were set to the CAT catchment grid: `setcell ..\drainage\cat setwindow ..\drainage\cat ..\drainage\cat popdens = selectmask (H:\NFHI\Data_Layers\NOAA\Pop2000\pop2000, ..\drainage\cat)`

Census 2000 TIGER Roads: Census 2000 TIGER Road shapefiles (1:100,000 scale) were downloaded as a county zip file from ESRI. After extracting the county shapefiles, a statewide road shapefile was created using the MERGE tool in ArcToolbox (Data Management Tools\General). The resulting shapefile was checked for completeness against a county boundary file to ensure that no county shapefiles were

missing. Projection files (Geographic NAD83) were then imported for each shapefile. Each statewide road shapefile was clipped using ArcToolbox (Analysis Tools\Extract), using a dissolved NHDPlus catchment boundary as the clip polygon. The clipped shapefiles were then merged for each NHDPlus basin using MERGE in ArcMap. Road crossing shapefiles were generated using the INTERSECT tool in ArcMap (Analysis Tools\Overlay\Intersect), with the output shapefile feature type set to point.

National Inventory of Dams (NID): The spatial reference for the downloaded NID point shapefile was assumed to be Geographic NAD83, as there was no projection file and no coordinate system information in the metadata. The national dam dataset was selected and exported for each NHDPlus region using the 'Select by Location' feature in ArcMap. The comid and grid\_code fields were added to the regional dam shapefiles by doing a spatial join in ArcView using the polygon catchment shapefile (catchment.shp) for each NHDPlus region. The Compiled Table Tools extension was then used to permanently add the catchment.shp attributes to the dam shapefile table.

Active Mines and Mineral Processing Plants: The spatial reference (.prj) was defined as Geographic NAD27 for the mineplant-fUS point shapefile prior to projecting to the Geographic NAD83 coordinate system. Mines were selected for each NHDPlus processing basin using the 'Select by Location' feature in ArcMap and exported to a new shapefile. The comid and grid\_code fields were added by doing a spatial join of catchment.shp to the mines shapefile in ArcView, then, using the Compiled Table Tools extension, the fields were permanently joined to the mines.dbf table.

EPA Geospatial Data: The EPA Geospatial Data point layer contains information about facilities or sites from the following five national environmental programs: Superfund National Priorities List (NPL) from the Compensation and Liability Information System [CERCLIS]; Resource Conservation and Recovery Act (RCRA) - Treatment, Storage, and Disposal Facilities (TSDF); Toxics Release Inventory (TRI) Program; National Environmental Performance Track (NEPT); and the National Pollutant Discharge Elimination System (NPDES) Majors from the Permit Compliance System (PCS). These sites were selected for each NHDPlus region using the 'Select by Location' feature in ArcMap and exported to a new shapefile. The comid and grid\_code fields were added by doing a spatial join of catchment.shp to the EPA sites shapefile in ArcView, then, using the Compiled Table Tools extension, the fields were permanently joined to the dams.dbf table. Five additional fields (Cerc, Nept, Pcs, Rcra, and Tri) were added and calculated as 0 if the site was not part of the regulation program, or 1 if it was part of the program. Sites may be regulated by more than one type of program.

NHDPlusV1 Reach Selection for NFHAP. The NHDPlusV1 dataset for the conterminous U.S. consists of 2.9 million reaches divided into 19 regions. Reaches fall into one of the following flowline feature type (FTYPE) classes: -Artificial Path -CanalDitch -Coastline -Connector -Pipeline -StreamRiver Steps used for reach selection: 1. The 'Coastline' and 'Pipeline' flowline feature types were removed. 2. Next, selection of reaches was done using the polygon attribute table for the catchment shapefile to identify reaches that had a delineated local catchment. Reaches that did not have a catchment were dropped. The set of dropped reaches included those that were either disconnected from the stream network or had an undetermined flow direction (FLOWDIR = 'Uninitialized'). In addition, reaches that were part of the

stream network (FLOWDIR = 'With Digitized'), but lacked a local catchment, were dropped in this step. These latter cases occur for very short reaches (generally <50 meters) that did not get a watershed due to their size (catchments were derived from elevation grids that have a 30 meter cell size). 3. Reaches with a hydrologic sequence number (HYDROSEQ field in the flowlinevaa.dbf table) equal to zero were dropped. This number places the reaches in hydrologic sequence and is used in the aggregation of variables for the cumulative catchment. 4. Additional selection was done for the 'Artificial Path' flowline feature type. Artificial paths in the NHDPlus represent a flowline through a polygon that is either in the NHDWaterbody or NHDArea polygon dataset. The polygon feature types (FTYPE) for each dataset are listed below: NHDWaterbody - LakePond - Reservoir - SwampMarsh - IceMass - Playa NHDArea - StreamRiver - CanalDitch - Wash - Area of complex channels All artificial paths within NHDWaterbody polygons were removed. Artificial paths in the NHDArea polygon dataset with 'CanalDitch', 'Wash', and 'Area of complex channels' polygon feature types were also dropped. For some artificial paths, there is no designated feature type within either the NHDWaterbody or NHDArea polygon datasets. These reaches were removed by identifying artificial paths with WBAREACOMID = -9998 in the flowline attribute table. Additional selection was done for artificial paths within the NHDArea 'StreamRiver' polygon feature type: Artificial Path Selection for 'StreamRiver' Feature Type 1. We identified all artificial paths in the NHDArea shapefile that were of FTYPE 'StreamRiver'. This step was done by linking the NHDArea attribute table to the NHDFlowline attribute table using the COMID field in NHDArea.dbf and the WBAREACOMID in NHDFlowline.dbf. 2. 'StreamRiver' artificial paths were then divided into the six drainage area size classes used in NFHAP assessment: Headwater (<= 10 sqkm), Creek(>10 and <= 100 sqkm), Small River (>100 and <= 1000 sqkm), Medium River (>1000 and <= 10000 sqkm), Large River (>10000 and <= 25000 sqkm), and Great River (>25000 sqkm). The CUMDRAINAG field from the flowlineattributesflow.dbf table was used for the drainage area values. 3. Within each size class, artificial paths were divided into the following reach length classes (in meters): <50, 50-100, 100-200, 200-300, 300-400, 400-500, 500-600, 600-700, 700-800, 800-900, 900-1000, 1000-1500, 1500-2000, 2000-2500, >2500. 4. Local catchments for drainage area/reach length size class combinations (i.e. Headwater, <50) were viewed using GIS to determine if the reaches represented a (1) mainstem reach, (2) divergence, (3) tributary to larger stream/river, or a (4) backwater/tributary combination. When viewing these examples, if it was decided that a majority of these cases did not represent a mainstem reach or backwater/tributary combination, then that size class/length combination was identified for removal. 5. Reaches in the following drainage area/reach length combinations were identified for exclusion: Headwater - <50, 50-100, and 100-200 Creek - <50 and 50-100 Small River - <50 5. Divergences Divergences are identified in the NHDPlus dataset using the DIVERGENCE field in the nhdflinevaa.dbf table. A value of 1 indicates a major divergent path and a value of 2 is assigned to the minor divergent path. Reaches identified as a minor divergence (DIVERGENCE = 2) were removed. 6. Boundary Reaches Flowlines along the borders with Canada and Mexico were selected and removed. 7. Estuary Artificial Paths 1. A high resolution estuary shapefile was received from the coastal NFHAP group. 2. The NHDPLUS midpoints were intersected with the estuary file. The intersecting COMIDs were dropped from the list of COMIDs assessed by the freshwater stream assessment. 3. The estuary shapefile was found to not fill entire channels of water, so we then manually inspected remaining COMIDs to make sure they should be included in our assessment. To do this we used a coastline shapefile created by NOAA (midresolution) as a reference of the coastline. We also used the estuary

shapefile to limit our search inland (e.g. we only searched as far inland as the estuary polygons and all waterbodies closer to the ocean were considered saltwater). All COMIDs with artificial paths in estuaries were then dropped from the inland (freshwater) stream assessment.

These data are joined to NHDPlusV1 catchments using the COMID field. The data tables can also be joined to NHDPlusV1 flowlines using the COMID field.

Vector

Human Disturbance Data

Human Disturbance Variable Descriptions, Units, and Sources (L\_Attribute = Local Catchment, N\_Attribute = Network Catchment)

Producer defined

For each biological metric in each of 9 ecoregions across the conterminous United States, the most limiting anthropogenic disturbance operating on a given metric summarized within local catchments were identified following an approach described in Esselman et al. (2011). Scores determined for individual biological metrics were then averaged to characterize the broad response of fish assemblages to disturbances operating in local catchments. Scores range from 1 (highest risk of habitat degradation) to 5 (lowest risk of habitat degradation).

NFHAP

0

5

NDistIndex

For each biological metric in each of 9 ecoregions across the conterminous United States, the most limiting anthropogenic disturbance operating on a given metric summarized within network catchments were identified following an approach described in Esselman et al. (2011). Scores determined for individual biological metrics were then averaged to characterize the broad response of fish assemblages to disturbances operating in network catchments. Scores range from 1 (highest risk of habitat degradation) to 5 (lowest risk of habitat degradation).

NFHAP

0

5

CumDistInd

For each biological metric in each of 9 ecoregions across the conterminous United States, the most limiting anthropogenic disturbance operating on a given metric summarized within either local or network catchments were identified following an approach described in Esselman et al. (2011). Scores determined for individual biological metrics were then averaged to characterize the broad response of fish assemblages to disturbances in operating in either local or network catchments. Note that CumDistIndex scores can be lower than either of the LDistIndex and NDistIndex scores. Scores range from 1 (highest risk of habitat degradation) to 5 (lowest risk of habitat degradation).

NFHAP

0

5

CumDistTXT

Risk of Current Habitat Degradation. Created using CumDistIndex scores (very low = 4.34-5.0, low = 3.5-4.33, moderate = 2.51-3.49, high = 1.51-2.5, very high = 1.0-1.5, unscored reach = 0).

NFHAP

High

High represents a CumDistIndex score between 1.51-2.5.

Producer defined

Low

Low represents CumDistIndex scores between 3.5-4.33.

Producer defined

Very Low

Very Low represents CumDistIndex scores between 4.34-5.0.

Producer defined

Moderate

Moderate represents CumDistIndex scores between 2.51-3.49.

Producer defined

Very High

Very High represents CumDistIndex scores between 1.0-1.5.

Producer defined

Unscored reach

Unscored reach represents CumDistIndex scores of 0.

Producer defined

N\_UrbanLC

% of network catchment defined as developed, open space and low intensity

Multi-Resolution Land Characteristics Consortium (MRLC)

0

100

N\_UrbanMC

% of network catchment defined as developed, medium intensity

Multi-Resolution Land Characteristics Consortium (MRLC)

0

100

N\_UrbanHC

% of network catchment defined as developed, high intensity

Multi-Resolution Land Characteristics Consortium (MRLC)

0

100

N\_PastureC

% of network catchment defined as pasture/hay

Multi-Resolution Land Characteristics Consortium (MRLC)

0

100

N\_CropsC

% of network catchment defined as cultivated crops  
Multi-Resolution Land Characteristics Consortium (MRLC)  
0  
100  
N\_PopdensC  
Mean population density within network catchment (units = Individuals/km2)  
National Oceanic and Atmospheric Administration (NOAA)  
0  
12493.48  
N\_RoadcrC  
Number of road crossings within network catchment  
US Census  
0  
1045959  
N\_RoadlenC  
Length of roads within network catchment in meters  
US Census  
0  
3849063978.85  
N\_DamsC  
Number of dams within network catchment  
U.S. Army Corps of Engineers (USACE)  
0  
40465  
N\_MinesC  
Number of mines or mineral processing plants within network catchment  
U.S. Geological Survey (USGS)  
0  
2497  
N\_TRIC  
Number of TRI sites within network catchment; Toxics Release Inventory (TRI) Program  
U.S. Environmental Protection Agency (US EPA)  
0  
17214  
N\_NPDESC  
Number of NPDES sites within network catchment; National Pollutant Discharge Elimination System (NPDES) Majors from the Permit Compliance System (PCS)  
U.S. Environmental Protection Agency (US EPA)  
0  
2197  
N\_CERCC

Number of SNPL sites within network catchment; Superfund National Priorities List (SNPL) from the Compensation and Liability Information System (CERCLIS)  
U.S. Environmental Protection Agency (US EPA)

0

405

N\_AREASQKMC

area of the network catchment (km<sup>2</sup>)

NFHAP

0.001

3044951.206

Various measures of human land use, infrastructure, and other anthropogenic landscape-scale characteristics were summarized in both local and network catchments of stream arcs of the NHDPlusV1 and assumed to represent anthropogenic disturbances to landscapes that would likely impact stream habitats. Within each of 9 aggregated Omernik (1987) ecoregions as defined by the EPA's Wadeable Streams Assessment (Paulsen et al., 2008), key biological metrics were selected following an approach to identify those metrics that were most sensitive to anthropogenic disturbance and that were widely distributed throughout ecoregions (Stoddard et al. 2008). Habitat condition scores were created based on responsiveness of biological metrics to anthropogenic landscape disturbances throughout ecoregions, and separate scores were created by considering disturbances within local catchments (LDistIndex), network catchments (NDistIndex), and a cumulative score that accounted for the most limiting disturbance operating on a given biological metric in either local or network catchments (CumDistIndex). Literature Cited Esselman, P.C., Infante, D.M., Wang, L., Wu, D., Cooper, A.R., Taylor, W.W., 2011. An index of cumulative disturbance to river fish habitats of the conterminous United States from landscape anthropogenic activities. *Ecol. Restor.* 29, 133-151. Stoddard, J.L., Herlihy, A.T., Peck, D.V., Hughes, R.M., Whittier, T.R., Tarquinio, E., 2008. A process for creating multimetric indices for large-scale aquatic surveys. *J. N. Am. Benthol. Soc.* 27, 878-891.  
See individual descriptions for each attribute.

Andrea Ostroff

mailing and physical

Denver Federal Center Bldg 810, MS 302

Denver

CO

80225

USA

703.648.4070

aostroff@usgs.gov

20130215

Arthur Cooper

Department of Fisheries and Wildlife, Michigan State University

mailing and physical

Natural Resources 480 Wilson Rd. Rm 13

East Lansing  
MI  
48824-1222  
USA  
(517) 432-8048  
coopera6@msu.edu

FDGC Content Standard for Digital Geospatial Metadata and Biological Data Profile  
FDGC-STD-001-1998

Additional Metadata:

This shapefile contains summaries of habitat condition indices (HCI scores) from the National Fish Habitat Action Plan (NFHAP) 2010 National Assessments for 12 digit Hydrological Unit Codes (HUC12s) of the United States. Initial HCI scores were developed by summarizing landscape factors representing human disturbances of rivers throughout the United States. The HCI scores were developed in three separate assessments (Conterminous U.S., Hawaii, and Alaska) due to differences in data availability across these regions.

In the NFHAP 2010 Alaska assessment HCI values were already attributed to HUC12s. For this reason values for Alaska in this shapefile are identical to those represented in the Alaska assessment. To summarize data into HUC12s for the Conterminous United States and Hawaii a length-weighted average was used (i.e. the cumulative HCI score assigned to each river reach within a HUC was weighted by reach length using the formula  $(H1 * L1 + H2 * L2 \dots + HX * LX) / (L1 + L2 \dots + LX)$  where H = reach HCI score and L = reach length).

Although data from all three assessments are summarized to HUC12s in this shapefile, it is important that values are not compared across assessment regions. More information on the three assessments can be found at the following links: Conterminous United States (<http://dx.doi.org/doi:10.5066/F7B56GN1>) ; Alaska (<http://dx.doi.org/doi:10.5066/F7KD1VWD>); Hawaii (<http://dx.doi.org/doi:10.5066/F7V9863B>).

The results of the assessment are characterized as risk of current habitat degradation, i.e., for any particular area the data suggest some level of risk (high, low, or in between) that the habitat is currently in a degraded condition. The assessment uses risk of habitat degradation instead of known habitat degradation because habitat condition has not been objectively or consistently measured for a majority of aquatic habitats in the United States. As a result, the assessments for this report focus on identifying factors that are responsible for degrading habitat, rather than using direct measurements of habitat condition.

Although a large amount of data went into the assessments, some key information is missing due to the lack of nationally consistent data. Examples of missing information include historical and regional degradation due to logging, mining, or animal farming, the effect of water pumped or otherwise diverted from streams and dams less than six feet high that fragment streams and obstruct fish passage. Because this information is missing, areas mapped as having a low risk of current habitat degradation



due to the factors assessed may be under the influence of factors not included in the assessment, and thus actually may be at a higher risk of current habitat degradation than depicted on the maps. Users should interpret the maps carefully. The maps should not be understood as depicting absolute habitat condition. They do serve as a guide to the relative magnitude and geographic distribution of many factors that contribute to aquatic habitat degradation. Varied methodologies were used for assessing the rivers of the lower 48 States, the rivers of Alaska and Hawaii, the estuaries of the lower 48 States, and the estuaries of Southeast Alaska.

## Group – Imperiled or Federally Listed Aquatic or Wetland Species

Properties Covered:

1. Total Wetland and Aquatic Imperiled of Federally Listed Species

Property Note:

Source data attributes summed in study:

1. AQ\_TOT - Total number of Aquatic Associated G1-G2/ESA species in each HUC12. (No information was available at this time for any watersheds in DE, MA, or PA. No information was available at this time for animal species in WA; the only species counts provided for watersheds in WA are for plants.) [Data Fact Sheet](#)
2. WT\_TOT - Total number of Wetland Associated G1-G2/ESA species in each HUC12. (No information was available at this time for any watersheds in DE, MA, or PA. No information was available at this time for animal species in WA; the only species counts provided for watersheds in WA are for plants.)

Geographic Extent Note: Property includes AK/HI\*

\*EPA Waterscape base geography for Hawaii is not part of the Watershed Boundary Dataset used for other states ([Source](#)). The watersheds used to score Hawaii's properties are used by the Hawaii Department of Health state water quality agency. They were developed for The Commission on Water Resources Management, a state agency within the State Department of Land and Natural Resources that oversees water resource quantity, allocation, etc. and were obtained from Hudson Slay, U.S. EPA, Region 9-Pacific Islands Contact Office, 2/12/2015.

Description: State HUC12s ranked based on the total number of Imperiled or Federally Listed Aquatic and Wetland Species.

Scoring Methodology: State HUC12 scores are not normalized by state. Total number of Imperiled or Federally Listed Aquatic and Wetland Species is calculated for each HUC12 and applied to State HUC12s. State HUC12s are scored '2', '4', '6', '8', and '10' based on their total number of Imperiled or Federally Listed Aquatic and Wetland Species using a Jenks classification system with classes:

- 1-2 Species = 2
- 3-5 Species = 4
- 6-11 Species = 6
- 12-20 Species = 8
- >20 Species = 10

Scoring Note: EnviroAtlas links Natureserve's Imperiled or Federally Listed Species by HUC12 data to the WBD from March 2011, while the EPA Waterscape tool uses NHDPlusV2 WBD. Data values were directly applied to the current set of HUC12s if the results from a Coefficient of Areal Correspondence (CAC) was 99% or higher. For instances where multiple source HUC12s were combined, data were summed to arrive with a total for the new feature.

Process Details:

1. HUC12s values directly applied to current set of HUC12s based on the CAC value (Coefficient of Areal Correspondence) for each pair of 'common' HUC12s in the two WBD versions. CAC is computed as the Intersection area (between the two features with a common ID) and the Union area (of the same two features). This measures the overall areal correspondence between the two versions of the same feature. Any features with a CAC 99% or higher are considered a direct match (for the purposes of this property) and the HUC12 data is directly applied.
2. Intersect the unmatched HUC12s with the previous WBD HUC12s to find pairs of HUC12s with high intersection percent (50% or greater). Transfer IDs from one HUC12 dataset to the other for these pairs. Perform a CAC procedure for these features. This is referred to as a 'location-based CAC'. HUC12s scoring 99% or higher are also considered direct matches and the data for these HUC12s are directly applied.
3. Select records with CAC scores greater than 1 from Step 1. These are examples where multiple HUC12s were combined to form a new HUC12. Summarize source data to arrive at totals for these new HUC12s.
4. Transfer HUC12 values to State HUC12s

Download Date: 4/10/2014

Source: [Link](#)

NatureServe, EnviroAtlas - NatureServe Analysis of Imperiled or Federally Listed Species by HUC-12 for the Conterminous United States, US EPA Office of Research and Development (ORD) - National Exposure Research Laboratory (NERL), Research Triangle Park, NC, 20130405, [https://edg.epa.gov/data/Public/ORD/EnviroAtlas/National\\_metrics\\_Dec2013.zip](https://edg.epa.gov/data/Public/ORD/EnviroAtlas/National_metrics_Dec2013.zip), <http://enviroatlas.epa.gov/EnviroAtlas>, <http://www.natureserve.org/>

Metadata: [Link](#)

NatureServe

EnviroAtlas - NatureServe Analysis of Imperiled or Federally Listed Species by HUC-12 for the Conterminous United States

US EPA Office of Research and Development (ORD) - National Exposure Research Laboratory (NERL) Research Triangle Park, NC

20130405

[https://edg.epa.gov/data/Public/ORD/EnviroAtlas/National\\_metrics\\_Dec2013.zip](https://edg.epa.gov/data/Public/ORD/EnviroAtlas/National_metrics_Dec2013.zip)

<http://enviroatlas.epa.gov/EnviroAtlas>

<http://www.natureserve.org/>

Publication date

20111014

None. Please check sources, scale, accuracy, currentness and other available information. Please confirm that you are using the most recent copy of both data and metadata. Acknowledgement of the EPA would be appreciated.

This EnviroAtlas dataset includes analysis by NatureServe of species that are Imperiled (G1/G2) or Listed under the U.S. Endangered Species Act (ESA) by 12-digit Hydrologic Units (HUCs). The analysis results are for use and publication by both the LandScope America website and by the EnviroAtlas. Results are provided for the total number of Aquatic Associated G1-G2/ESA species, the total number of Wetland Associated G1-G2/ESA species, the total number of Terrestrial Associated G1-G2/ESA species, and the total number of Unknown Habitat Association G1-G2/ESA species in each HUC12. NatureServe is a non-profit organization dedicated to developing and providing information about the world's plants, animals, and ecological communities. NatureServe works in partnership with 82 independent Natural Heritage programs and Conservation Data Centers that gather scientific information on rare species and ecosystems in the United States, Latin America, and Canada (the Natural Heritage Network). NatureServe is a leading source for biodiversity information that is essential for effective conservation action. This dataset was produced by NatureServe to support research and online mapping activities related to EnviroAtlas. EnviroAtlas (<http://www.epa.gov/research/healthscience/health-nationalatlas.htm>) allows the user to interact with a web-based, easy-to-use, mapping application to view and analyze multiple ecosystem services for the contiguous United States. The dataset is available as downloadable data (<http://edg.epa.gov>) or as an EnviroAtlas map service. Additional descriptive information about each attribute in this dataset can be found in its associated EnviroAtlas Fact Sheet (<http://enviroatlas.epa.gov/EnviroAtlas/DataFactSheets>).

This dataset, which contains NatureServe analysis of species that are Imperiled (G1/G2) or Federally-listed by HUC-12, is for use and publication by both the LandScope America website and by EnviroAtlas. The overall goal of EnviroAtlas is to employ and develop the best available science to map indicators of ecosystem services production, demand, and drivers for the nation.

The data provided are for planning, assessment, and informational purposes. The data should not be considered a definitive statement on the presence, absence, or condition of biological elements at any given location. The lack of data for any geographic area cannot be construed to mean that no significant features are present. Site-specific projects or activities should be reviewed for potential environmental impacts with appropriate regulatory agencies. If ground-disturbing activities are proposed on a site, the appropriate state natural heritage program(s) can be contacted for a site-specific review of the project area. For a listing of all program websites, see the NatureServe home page at

<http://www.natureserve.org/visitLocal/index.jsp>. Attribute\_Accuracy\_Report: 1) NatureServe Conservation Status Ranks: NatureServe has conducted quality control checks to assure that the local, national and global status information are consistent for the element range-wide. 2) Federal Status Designations: NatureServe staff update the central databases with changes in status due to proposals and determinations to add taxa to the Lists of Endangered and Threatened Wildlife and Plants within two weeks of publication in the Federal Register. Addition and removal of candidates in Notices of Review or Notices of Reclassification are entered within four weeks of their publication. Where species have a partial or mixed federal status designation, the correct federal status has been assigned at the element occurrence level and only those occurrence records that are federally listed have been provided. 3) Taxonomy is constantly being updated based on the publication of new sources. See "Classification Sources" information on NatureServe Explorer:

<http://www.natureserve.org/explorer/class.htm>. Logical\_Consistency\_Report: Spatial Data: All element occurrence records are mapped as accurately as recorded by member programs. Element

occurrence (EO) locations are either (a) plotted manually on 1:24,000 USGS topographical maps and the coordinates are calculated in latitude and longitude using a map overlay; or (b) mapped in GIS using the Biotics Mapper tool (see process steps for information about mapping in this system). For point EOs, coordinates represent the population centroid of the element occurrence. Spatial data are updated and reviewed by the member programs on an ongoing basis. Any Element Occurrences known to be incorrectly identified or mapped have been excluded. Completeness\_Report: The completeness of NatureServe data varies between species. NatureServe data is particularly strong and very complete in tracking the terrestrial and freshwater vertebrate species, vascular plants, and entities with status under the U.S. Endangered Species Act (ESA) or Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Many invertebrate groups are completely tracked, but the databases on these elements continue to expand. The non-vascular plant data (lichens, mosses, liverworts & hornworts, fungi) is being actively developed and element occurrences of these groups will expand over the next few years. Marine species, even in coastal areas are not completely tracked and documented with element occurrences, however this varies across member programs. These data are dependent on the research and observations of many scientists and institutions, and reflect our current state of knowledge. Many areas have never been thoroughly surveyed, however, and the absence of data in any particular geographic area does not necessarily mean that species or ecological communities of concern are not present. In addition, new plants and animals are still being discovered. These data should not be regarded as a substitute for on-site surveys required for environmental assessments. If ground-disturbing activities are proposed on a site, the appropriate state natural heritage program(s) or conservation data center should be contacted for a site-specific review of the project area. For contact information, see the NatureServe web site at [www.natureserve.org](http://www.natureserve.org). In general, species location data tends to be incomplete or unavailable for most marine species and for tribal lands throughout the U.S. Data was not available at the HUC 12 scale through NatureServe at the time of this analysis for DE, MA, and PA. All watersheds intersecting with these states were selected, and the value reported in all of the species count columns is -1 to indicate the watersheds were not included in the results (as opposed to a value of null or 0 indicating a watershed was included but there were no intersecting species records). Data for animal species in Washington is not available through NatureServe because it is tracked by the Washington Department of Fish and Wildlife, which is a separate agency from the Washington Natural Heritage Program and is not a member of NatureServe's network. All watersheds intersecting with WA were selected, and the value reported in all of the columns for total counts of all species, and total counts of animal species is -1 to indicate the watersheds were not included in the results (as opposed to a value of null or 0 indicating a watershed was included but there were no intersecting species records). Total counts of plant species are included for the watersheds in WA. Positional\_Accuracy: Horizontal\_Positional\_Accuracy: Horizontal\_Positional\_Accuracy\_Report: The WBD was produced using Digital Raster Graphics (DRG's) as the source map. Data completeness for DRG files reflects content of the source graphic and may therefore be reflected in the completeness and accuracy of the WBD. The map was digitized from USGS 1:24,000-scale digital raster graphic base maps, with an inherited error of +/- 40 feet according to the USGS National Map Accuracy Standards. It is estimated that any errors detected were less than 10%. It should also be noted that while general rules of hydrology were used (i.e. natural water flow is downhill), the locations of boundaries is still somewhat subjective as the 1:24,000-scale DRG's do not always provide enough information for identifying the

location of the boundaries. Vertical\_Positional\_Accuracy: Vertical\_Positional\_Accuracy\_Report:

N/A

FIPS Pub 199

No Confidentiality

Standard Technical Controls

US Environmental Protection Agency, Research Triangle Park

EnviroAtlas Coordinator

ORD/NERL/EnviroAtlas

mailing address

109 TW Alexander Dr.

Research Triangle Park

NC

27711

000-000-0000

[EnviroAtlas@epa.gov](mailto:EnviroAtlas@epa.gov)

Tests for integrity have not been performed.

Features represented have not been tested for completeness

Data were collected using methods that have unknown accuracy (EPA National Geospatial Data Policy [NGDP] Accuracy Tier 10). For more information, please see EPA's NGDP at

<http://epa.gov/geospatial/policies.html>

201110 - 201201

NatureServe Central Data Exchange and Reconciliation

201110 - 201201

Mapping With Biotics (version 3.1 and 4.0)

201110 - 201201

Analysis to generate total counts of G1/G2 and ESA species by habitat category by HUC12 watershed.

coordinate pair

meters

0.000001

0.000001

Albers Conical Equal Area

29.500000

45.500000

-96.000000

23.000000

0.000000

0.000000

North American Datum of 1983

Geodetic Reference System 80

6378137.000000

298.257222

Downloadable Data

Although these data have been processed successfully on a computer system at the Environmental Protection Agency, no warranty expressed or implied is made regarding the accuracy or utility of the data on any other system or for general or scientific purposes, nor shall the act of distribution constitute any such warranty. It is also strongly recommended that careful attention be paid to the contents of the metadata file associated with these data to evaluate data set limitations, restrictions or intended use. The U.S. Environmental Protection Agency shall not be held liable for improper or incorrect use of the data described and/or contained herein.

US Environmental Protection Agency, Research Triangle Park

EnviroAtlas Coordinator

ORD/NERL/EnviroAtlas

mailing address

109 TW Alexander Dr.

Research Triangle Park

NC

27711

000-000-0000

EnviroAtlas@epa.gov

FGDC Content Standard for Digital Geospatial Metadata

FGDC-STD-001-1998

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US Environmental Protection Agency, Research Triangle Park

EnviroAtlas Coordinator

ORD/NERL/EnviroAtlas

mailing address

109 TW Alexander Dr.

Research Triangle Park

NC

27711

000-000-0000

[EnviroAtlas@epa.gov](mailto:EnviroAtlas@epa.gov)

natureserve

NatureServe Analysis of Imperiled or Federally Listed Species by HUC-12

NatureServe

HUC\_12

Twelve Digit Hydrologic Unit Code. This field provides a unique 12-digit code for each subwatershed. Numbers were assigned in an upstream to downstream fashion. Where no downstream/upstream relationship could be determined, numbers were assigned in a clockwise fashion.

Federal Guidelines, Requirements, and Procedures for the National Watershed Boundary Dataset; Chapter 3 of Section A; Federal Standards, Book 11, Collection and Delineation of Spatial Data; Techniques and Methods 11-A3.

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999999999999

AQ\_TOT

Total number of Aquatic Associated G1-G2/ESA species in each HUC12. (NOTE: A value of "-1" indicates that no data for this category was provided for the watershed. No information was available at this time for any watersheds in DE, MA, or PA. No information was available at this time for animal species in WA; the only species counts provided for watersheds in WA are for plants.)

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1

24

WT\_TOT

Total number of Wetland Associated G1-G2/ESA species in each HUC12. (NOTE: A value of "-1" indicates that no data for this category was provided for the watershed. No information was available at this time for any watersheds in DE, MA, or PA. No information was available at this time for animal species in WA; the only species counts provided for watersheds in WA are for plants.)

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<http://enviroatlas.epa.gov/EnviroAtlas/DataFactSheets>

Detailed information about the Heritage methodology and data development methods are available online. These materials include detailed explanations and documentation of: Classification - Classification standards, methods, and references for plants, ecological communities, vertebrates, and invertebrates. NatureServe Conservation Status - Conservation status ranks related to relative imperilment on global, national, and subnational scales. National Status - U.S. Endangered Species Act and the Committee on Status of Endangered Wildlife in Canada. Distribution - Data sources for plants, animals, and ecological communities. In addition, there is a summary of the processes used in plant, animal, and ecological community data development. For more information, see:

<http://www.natureserve.org/explorer/methods.htm>. Detailed documentation for the Element Occurrence (EO) Data Standard with the revised EO Methodology: NatureServe and the Natural Heritage Programs and Conservation Data Centres are currently in the process of implementing this standard and converting existing EO data to meet the updated methodology. Biotics Tracker and Biotics Mapper, the database software, incorporate the updated EO methodology. For more information, see:

Entity\_and\_Attribute\_Detail\_Citation: <http://www.natureserve.org/prodServices/eodata.jsp>

Process\_Step: Process\_Description: Analysis to generate total counts of G1/G2 and ESA species by habitat category by HUC12 watershed. 1) All tabular U.S. Element Occurrence (EO) records (except for MA and PA, which NatureServe does not have precise location data for in-house) were selected and exported for species with a Rounded Global Rank of G1 or G2 (including related infrataxa), or with federal U.S. ESA status. 2) Because most animal location data for ID exists as observation data that has not yet been converted to EOs in NatureServe's database, a copy of the tabular ID observation point data for G1/G2 and federal status animals was reformatted to have a common set of attributes as the EO data in step 1, and then was combined. 3) The following records were excluded from the dataset: -



EO records known to have been incorrectly identified. - EO records flagged as historic or extirpated, and EO records for species that have been flagged as historic or extirpated at the state level. - EO records from the Tennessee Valley Authority program that have been flagged as being duplicates of state program records in the same jurisdiction. 4) For non-ESA species, records for infrataxa were "rolled-up" to the parent full species level. This was done by overwriting infrataxa attributes with the values of their related full parent species. This helps to create a more consistent dataset across watersheds, and avoid double counting species in situations where a watershed straddles a state line, and one state is tracking locations for a species at the infrataxa level, while a neighboring state is tracking the same species at the full species level. This was not done for ESA species because most states track location data at whichever taxonomic level it applies, and when counting total numbers of listed species it is usually preferred to count infrataxa separately if there are multiple infrataxa in an area that carry status. 5) A layer of the polygon shapes representing the tabular records in the steps above was created. Using ArcMap, the EO shapes and the boundaries of the 12-digit watersheds were intersected using Spatial Join operation. This resulted in a table containing a separate row for each 12-digit watershed that each EO record intersects with. 6) The output table from the Spatial Join was joined to the tabular attributes of the EOs, and a new table was created having a separate row for each EO in each watershed, along with all the related attributes. This table was then summarized to remove any duplicate EO/HUC-12 rows created from the GIS overlay. 7) The table from step 6 was summarized again to create a new table with a unique list of each species in each HUC 12 watershed. 8) Habitat domain information was exported for all species in the dataset for which it was available. Based on the habitat values, all species were flagged as aquatic, wetland, or terrestrial (or any combination - categories are not mutually exclusive). 9) Species for which no habitat data was available were sent to botany and zoology staff for review. Where possible, species were manually assigned to the aquatic, wetland, and terrestrial categories based on expert opinion. These species were then flagged accordingly in the dataset. Any remaining species that could not be designated under the 3 habitat categories were assigned to a 4th category - unknown. 10) Based on the habitat category assignments, tables were generated for the following: total counts of G1/G2 and ESA aquatic animal species per HUC12, total counts of G1/G2 and ESA wetland animal species per HUC12, total counts of G1/G2 and ESA terrestrial animal species per HUC12, total counts of G1/G2 and ESA unknown habitat animal species per HUC12, total counts of G1/G2 and ESA aquatic plant species per HUC12, total counts of G1/G2 and ESA wetland plant species per HUC12, total counts of G1/G2 and ESA terrestrial plant species per HUC12, total counts of G1/G2 and ESA unknown habitat plant species per HUC12. 11) The total counts tables of aquatic, wetland, terrestrial, and unknown species by HUC12 were each joined to the attribute table of the HUC 12 GIS layer, and the total counts were added to the layer table as a new set of attributes. 12) Data for DE, MA, and PA were not available for this analysis, and all 12-digit HUCs in those states were selected, and all of the species count columns in those watersheds were recalculated to a value of -1 to symbolize that data for those watersheds is not included in the results, even if there was data for portions of those states from neighboring jurisdictions. 13) Animal data for WA are not currently available through NatureServe, and all 12-digit HUCs in WA were selected, and all of the total species count columns and animal species count columns in those watersheds were recalculated to a value of -1 to symbolize that data for those watersheds is not included in the results, even if there was data for portions of those states from neighboring jurisdictions. (Counts of plant species are included in those watersheds

however.) 14) The attribute table of the GIS layer containing the final counts of species was exported as a stand-alone .dbf table. Source\_Used\_Citation\_Abbreviation: USDA NRCS WBD Process\_Date: 201110 - 201201 Process\_Step: Process\_Description: Mapping With Biotics Using Biotics (version 3.1 and 4.0). The software essentially walks the user through the process for developing EO reps according to the revised EO methodology. For a comprehensive description of this methodology, see: <http://whiteoak.natureserve.org/eodraft/index.htm>. In addition, Biotics automatically creates and maintains separate themes for different feature types, along with associated attributes. In order to map a new EO using Biotics, the process is as follows: 1. Digitize and Evaluate Source Feature(s) a) Digitize the appropriate source feature (point, line, or polygon), based on the size of the observed area (compared with the minimum mapping unit for the scale map being used), and the amount and direction of uncertainty associated with that location. b) Assign attributes to source feature by entering fields in source feature window. c) If the source feature has areal estimated locational uncertainty, buffer with a graphic using the specified uncertainty distance class as the radius. d) Repeat the preceding three steps for each additional observed area for the Element. e) Evaluate separation distances (obtained from the EO specifications) between source feature(s) and other EO reps and independent source features of the same Element using circular graphics tool with diameter equal to appropriate separation distance. f) Indicate which feature(s) are to comprise an EO; when completed, remove uncertainty buffer graphics. 2. Develop EO Reps a) Based on the grouping of source features and their associated attributes, Biotics will automatically create EO reps, adding any uncertainty or procedural buffers as appropriate. b) Biotics will automatically assign a unique identifier and calculate spatial attributes, storing them with the appropriate themes. c) Periodically, batch import the spatial attributes for EO reps into the tabular EO database (BCD or other), and batch export tabular attributes from the tabular database back into Biotics. Process Description: Derivation of EOs polygons directly from field observations. Under current methodology and technology, all EOs are represented as polygon features. These features are derived from field observations that are digitized directly into GIS and buffered by locational uncertainty. Locational uncertainty can be measured/delimited directly from the field, estimated, or negligible (usually <6.25 m in all directions). Observations that are below a minimum mapping unit (12.5 m) distance in either two dimensions (points) or one dimension (lines) and that contain negligible locational uncertainty are buffered using a procedural buffer (6.25 m) to create polygons. Process Description: Derivation of EO polygons from EO point conversion. Under older methodology and technology, embodied by the Biological and Conservation Database (BCD), EOs were originally mapped as points on paper maps and then later digitized into GIS as point features. These features were assigned a precision value that indicated the accuracy of the locality of the EO. During conversion of these EOs from points to polygons, this precision value is used to determine the buffer distance used to create the EO polygon. Point EOs with a precision value of seconds (3-second radius) are given a default buffer of 0.062 mi during polygon conversion. Point EOs with a precision value of minutes (1-minute radius) are given a default buffer of 1.491 mi. Point EOs with a precision value of general are given a default buffer of 4.971 mi. Under this older methodology, some EOs were represented as rectangles, with the points of the rectangle representing the northernmost, southernmost, easternmost and westernmost extent of the EO. During conversion to polygons, the shape of these EOs remains a rectangle, but the feature itself is buffered by an estimated locational uncertainty distance. Process Description: Derivation of compound EO polygons. Discrete or non-contiguous EO polygons of the same species/element can be aggregated

into one compound EO depending upon the distance that separates the non-contiguous EOs. This distance, the separation distance, is the amount of intervening area that determines whether source features of an element should be grouped as part of the same (complex) element occurrence, or should be considered as discrete element occurrences. When available, separation distances are specific to species/elements. When unavailable, a default separation distance of 1km is used

Process\_Date: ongoing  
Process\_Step: Process\_Description: NatureServe Central Data Exchange and Reconciliation: NatureServe's Central Database is linked to all the U.S. and Canadian databases of the Natural Heritage Program and Conservation Data Centre member programs through a process of regular data exchange and reconciliation. Member programs send their data to NatureServe Central for taxonomic and status reconciliation. If necessary, incoming member program datasets are converted from their native file format to a format that is compatible with the NatureServe Central Databases, and GIS files of Element Occurrences are reprojected to a common projection. NatureServe Central Databases are updated with the latest scientific information developed by the member programs at the state and provincial scale, including updated Element Occurrence data. In return, member program databases are updated with the latest scientific information developed at the global scale by NatureServe Central. The data exchange and reconciliation process is a primary mechanism by which network data standards are upheld, thus helping to ensure a high level of accuracy, currency and quality to the data.

Process\_Date: ongoing.