Hydrography TWG Minutes 09/08/2016

Hydrography Requirements & Benefits Survey (HRBS) Results – Stephen Aichele, USGS

- HRBS webpage: http://nationalmap.gov/HRBS.html
- HRBS Executive Summary: http://nationalmap.gov/docs/HRBS_ExecSummary.pdf
- The HRBS will allow for the Expansion and Improvement of Hydrography in the National Map.
    - A justification document
- Lots of State Government respondents followed by Local Government than Federal Agencies
- Identified Mission Critical Activities (MCAs) that were grouped into Business Uses (BUs)
    - Five BUs floated to the top:
        - Water Quality
        - Water Resource Planning and Management
        - Flood Risk Management
        - River and Stream Flow Management
        - River and Stream Ecosystem Management
        - Priority order depended on respondent
- MCA Specific Requirements
    - Positional Accuracy: +/- 3 ft. requested, +/- 7 ft would do
    - Stream Density: 5.0 miles of channel/sq mile requested, 2.5 miles of channel/sq mile best
    - Smallest Contributing Watershed: 6 Ac requested, 60 Ac would do
    - Smallest Contributing Waterbody: < 1 Ac requested, 1 Ac would do
    - Update Frequency: annual requested, 2-3 yr would do
    - Post- Event (like a flood) Update: Highly desirable to nice to have
    - Level of detail: Best Available: Please see slide 17 of presentation
    - Level of Integration with other Datasets
        - Top 5:
            - Elevation
            - Stream Flow
            - Wetlands
            - Soils
            - Land Cover
        - Elevation/Hydro integration at 1:12000 requested
- Benefits: Annual Benefits of $538 to $544 million
- Doing some Pilot Studies
    - Looking at 5 Landscapes: humid, arid, rough, smooth, and coastal plus plain
    - Looking at 3 levels of Mapping, all using LiDAR
    - Want to improve positional accuracy of NHD Features and move to 1:4800
    - Will use to develop program recommendations

National Hydrography Dataset (NHD)/Watershed Boundary Dataset (WBD) Model Changes and Tool Updates – Elizabeth Stevens-Klein & Kristiana Elite, USGS

- NHD Model 2.2.1 (http://nhd.usgs.gov/NHDv2.2.1_poster_081216.pdf)
    - Main Path: An NHDPlus Attribute
    - In Network: An NHDPlus Attribute
    - Visibility Filter – For Scaling
- WBD Model 2.2.1 (http://nhd.usgs.gov/WBDv2.21_poster_8_1_16fin.pdf)

    - Renamed NonContributingAcres to NonContributingAreaAcres
    - Renamed NonContributingSqKm to NonContributingAreaSqKm
    - Renamed HUClass to HUDigit
    - Removed HULevel field.
- Desktop Tool Status
    - NHD: 10.3.1 tool version is 6.3.0.11. After 09/30/2016, 10.3.1 version will be required. (Older tools will only work on checkouts done before 09/30/2016.)
    - WBD: Currently requires 10.3.1 tool version 2.3.2.5
    - HEM: Works on ArcGIS 10.3.1
    - Conflation: Still on ArcGIS 10.2
- NHD & WBD Distribution Status
    - NHD: Staged Products in Testing. Expect State Extracts by early Oct. Will have Model 2.2.1 for both NHD & WBD
    - WBD: HUC 2 & National available.

Discussion: How to incorporate Events into the NHD? – Linda Davis, Lead

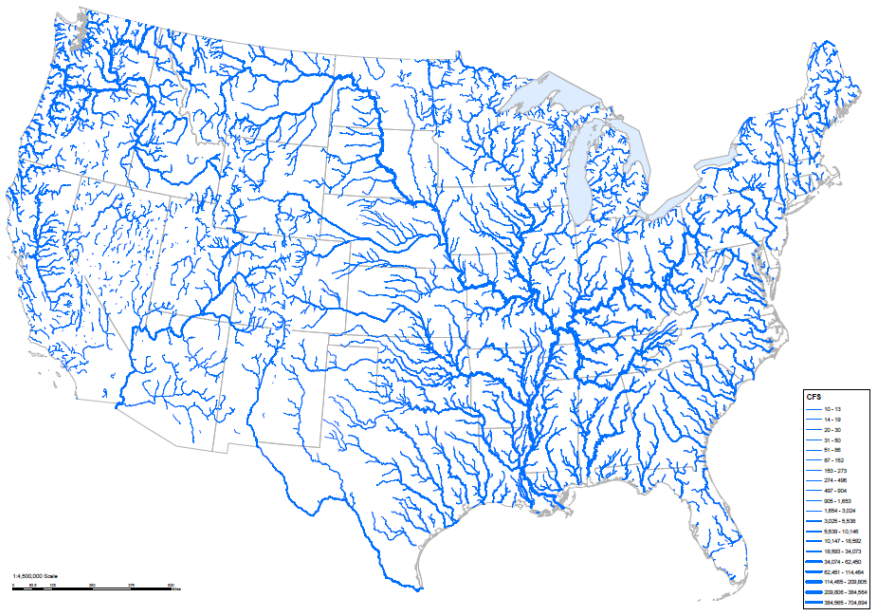
- NHD has 8177 point events in Idaho in national database – mostly water quality and stream gage stations.
- The flow alteration points in Idaho currently in national database are on ID/WA border. OR wants to add flow alteration (diversion) points too.
- HEM Tool the USGS tool for making NHD Events. EPA also has HEM Add-on Tools
- Discussion on: What we want to keep as a state? Where to store it? How to update? What to add to national database?
- Al Rea showed the National Hydrography Dataset Linked Data Registry (https://www.sciencebase.gov/catalog/item/530d0115e4b08f991722dce3?community=National+Hydrography+Dataset+Linked+Data+Registry)
    - For sharing data to public
    - For NHD Linked Datasets
    - Includes ESRI portal
    - Mike Tinker is the USGS Contact for the National Hydrography Dataset Linked Data Registry
- National Water Quality Portal (http://www.waterqualitydata.us/)
    - On 100K NHD Plus
    - Stations tied as Events by Catchment
    - Does Traces
    - Loads data from Storet
- NHD Feature Services
    - USGS needs clear requirements for NHD Feature Services
        - Which Feature Classes
        - Which Attributes
        - How do you want to use it
    - Have cached web services. (http://viewer.nationalmap.gov/services/ Theme Overlays)
    - Suggestion: Dissolve on GNISID or ReachCode for GNISID IS NULL to reduce segment density.

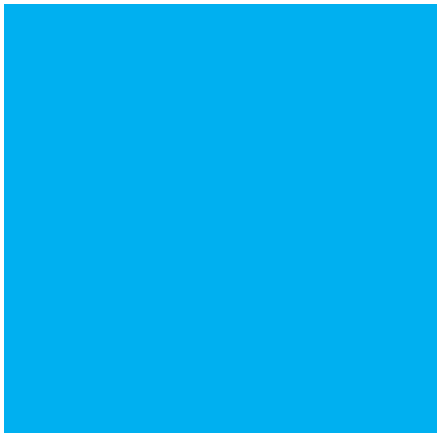
LiDAR Applications/EleHydro – Linda Davis

- The FY16/FY17 Broad Agency Announcement (BAA) for 3D Elevation Program (3DEP) has been released.
    - Proposals are due by 5 pm ET on Oct. 10, 2016
    - Tom Carlson tcarlson@usgs.gov, our Liason is the USGS contact for this effort. Nancy Glenn, BSU (nancyglenn@boisestate.edu) is the elevation lead here in Idaho.
- Per the Hydrography Goals of FY 2015-2017 (http://nhd.usgs.gov/documents/NHD_Plan.pdf), a goal is to "Create an NHD and WBD well-integrated with high resolution elevation data".
- May be possible to pair hydrography work with 3DEP.
- No funding now for hydrography work. May be funding avail in FY 2018 or later. Will require going through the USGS BAA process.

IDWR Updates: Lemhi & Big Lost : Please see 5 Minute Video Presentation.

Next Hydrography TWG: March 9, 2017





National Hydrography Requirements and Benefits Study

Steve Aichele
National Geospatial Program

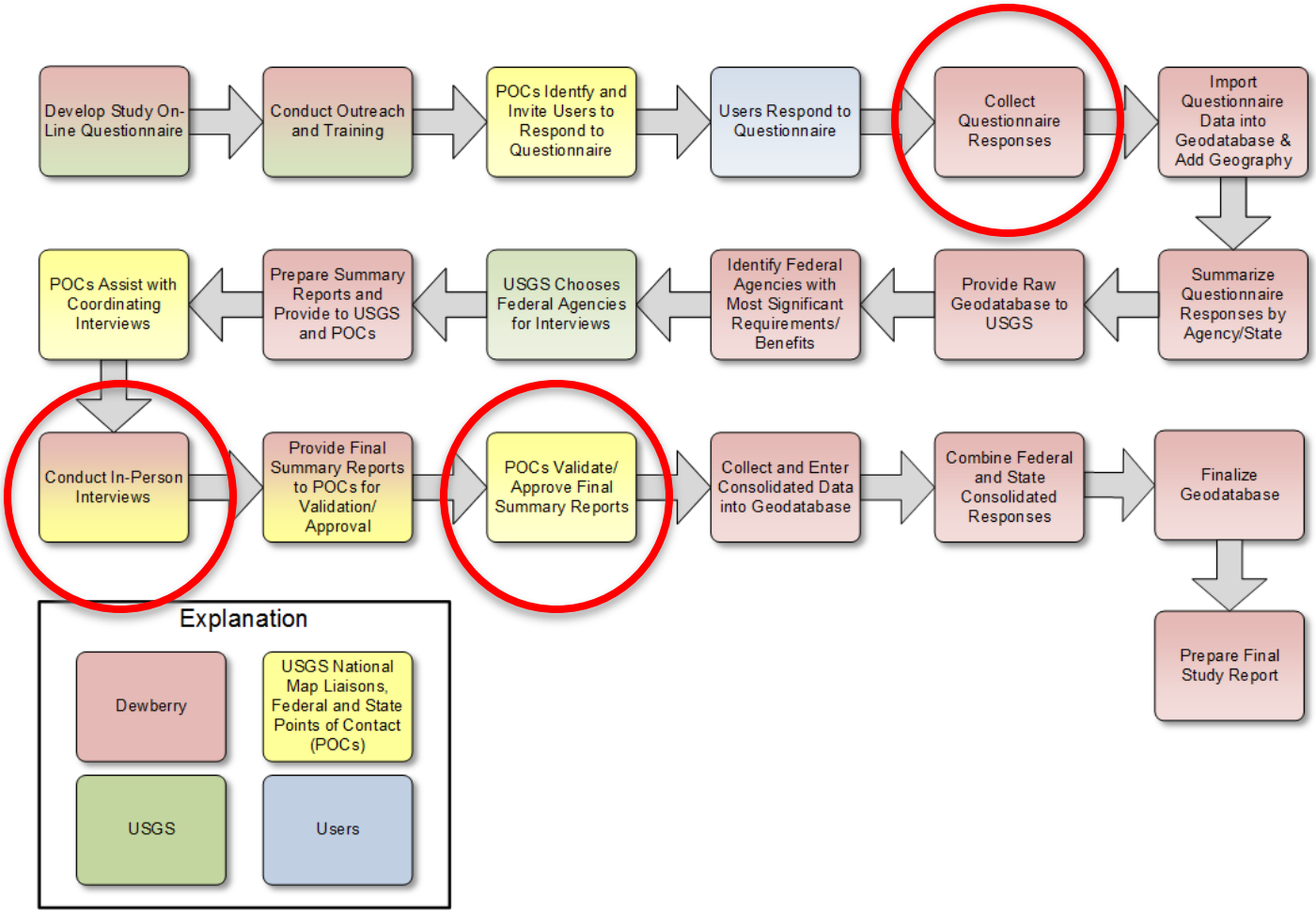
Roland Viger
National Research Program

USGS

The National Map

Study Process

National Hydrography Requirements and Benefits Study Workflow



Study Results

- Study participation
- Current use of national hydrography datasets (NHD, WBD, NHDPlus)
- MCAs
- Business Uses
- Requirements
- Federal Program Budgets
- Benefits

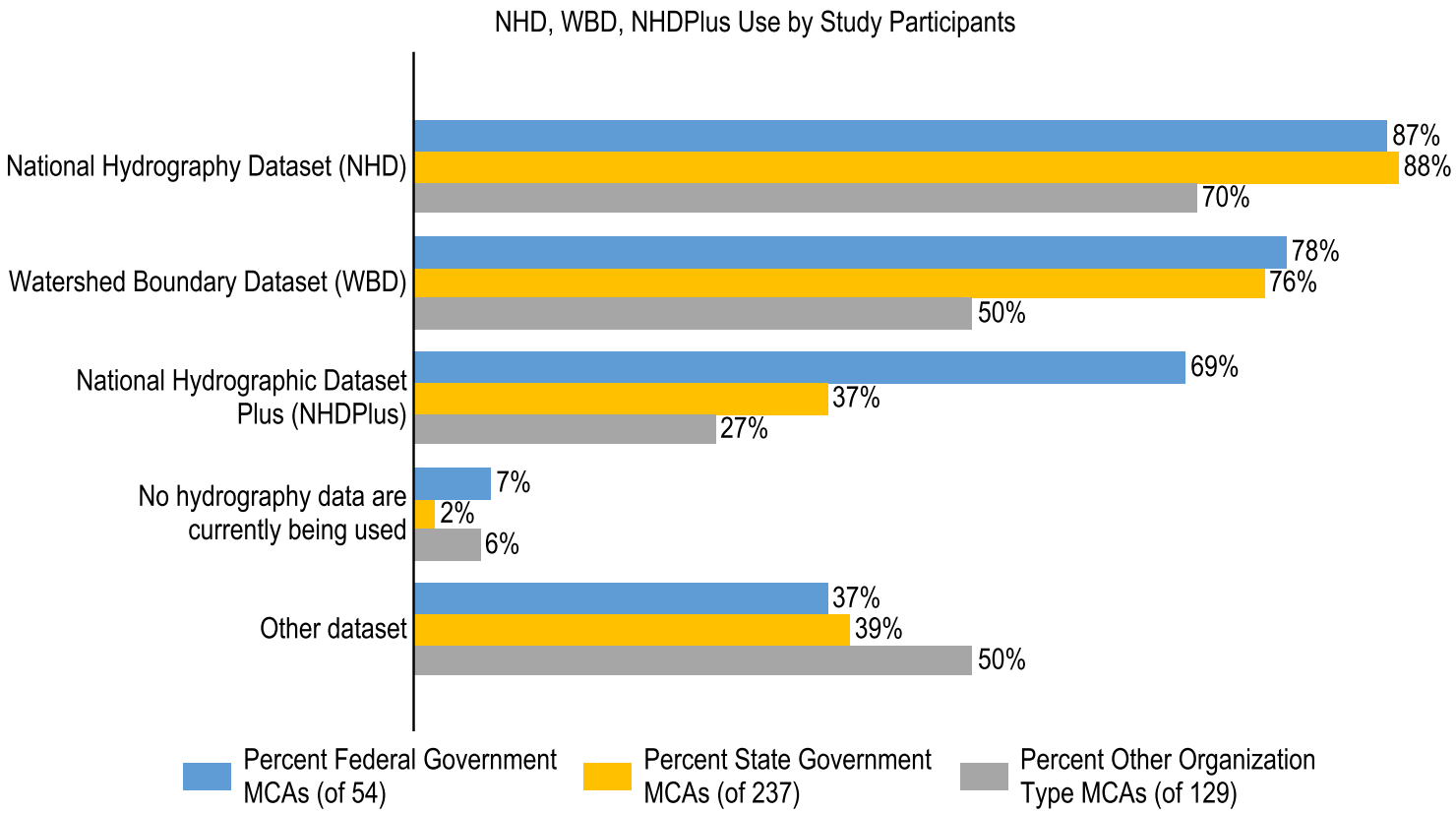
Study Participation

- Raw questionnaire responses: 577 MCAs from 501 respondents

- After interview/workshop consolidation:

Organization Type	Number of Agencies/ Entities	Number of MCAs	Percent of MCAs per Organization Type
Federal Agencies and Commissions	21	54	13%
Not for Profit	24	25	6%
Private or Commercial	14	16	4%
Regional, County, City, or Other Local Government	53	80	19%
State Government	183	237	56%
Tribal Government	8	8	2%
Total	303	420	100%

Current Use of National Datasets



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Mission Critical Activities

- Up to 5 Mission Critical Activities (MCAs) per respondent
- Total of 420 for study (after consolidation)
- Study participants provided the following for each MCA:
  - Title and description
  - One of 25 pre-defined Business Uses
  - Geographic area of interest
  - Requirements
  - Program budget
  - Current and future benefits

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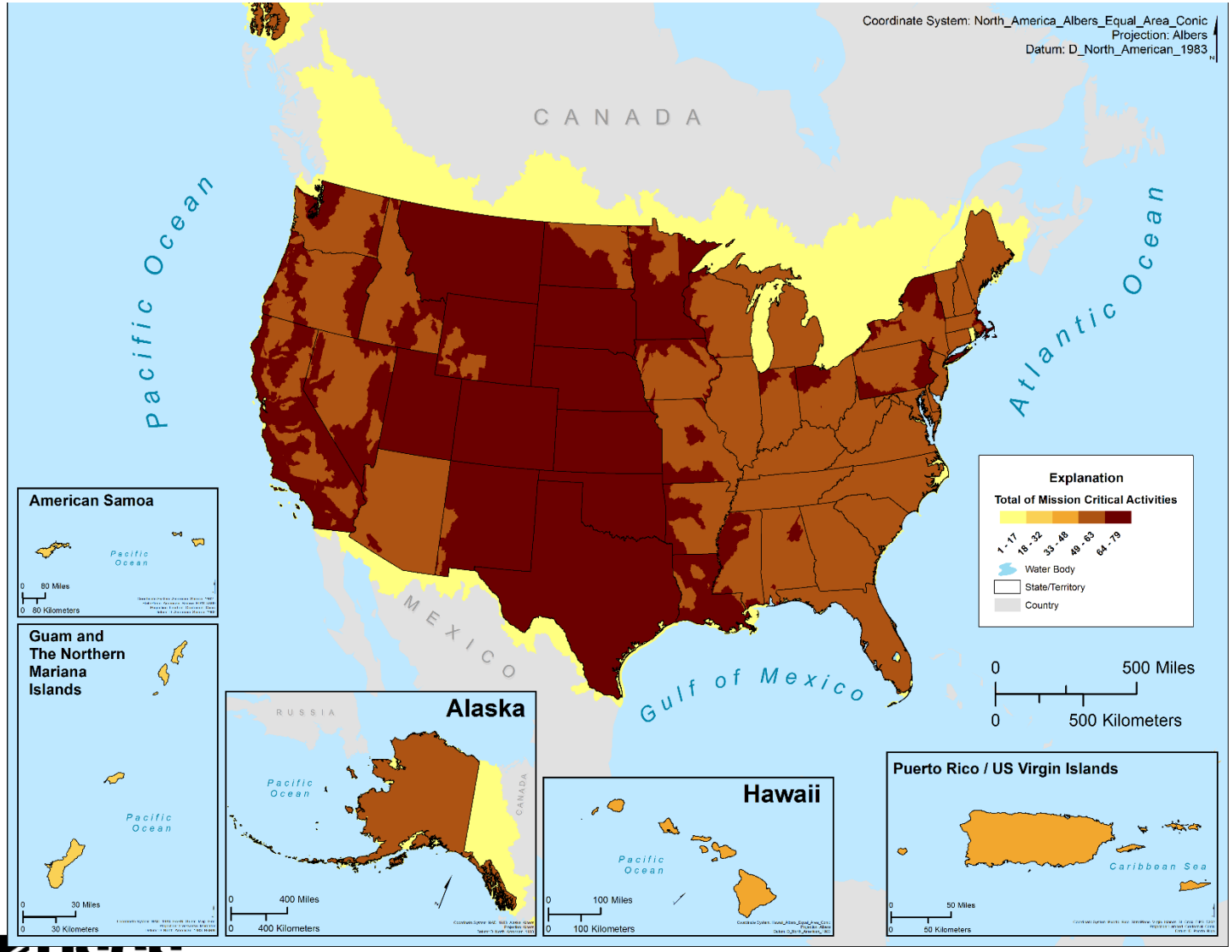
Mission Critical Activities



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Business Uses

BU	# MCAs	Business Use	BU	# MCAs	Business Use
4	79	Water Quality	7	5	Forest Resources Management
3	69	Water Resource Planning and Management	22	4	Health and Human Services
15	54	Flood Risk Management	11	3	Geologic Resource Assessment and Hazard Mitigation
1	44	River and Stream Flow Management	13	3	Renewable Energy Resources
2	34	Natural Resources Conservation	14	3	Oil and Gas Resources
5	34	River and Stream Ecosystem Management	19	3	Marine and Riverine Navigation Safety
20	18	Infrastructure and Construction Management	25	3	Recreation
21	17	Urban and Regional Planning	12	2	Resource Mining
10	9	Agriculture and Precision Farming	16	2	Sea Level Rise and Subsidence
24	9	Education K-12 and Beyond	8	1	Rangeland Management
6	8	Coastal Zone Management	17	1	Wildfire Management, Planning, and Response
9	8	Wildlife and Habitat Management	23	0	Real Estate, Banking, Mortgage, and Insurance
18	7	Homeland Security, Law Enforcement, and Disaster Response		420	Total

MCA Specific Requirements

- Positional accuracy
- Stream density
- Smallest contributing watershed
- Smallest mapped waterbody
- Update frequency
- Post-event update
- Level of detail
- Required characteristics/analytical function
- Level of integration between hydrography and other datasets

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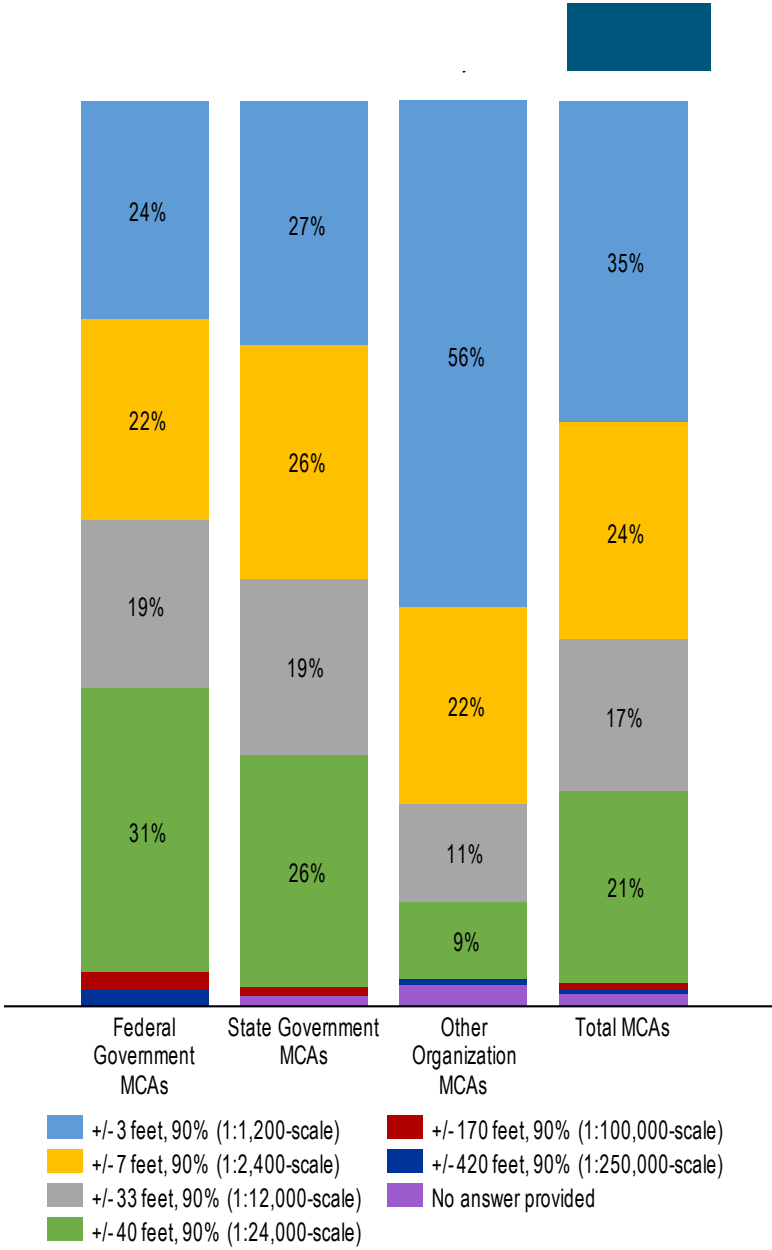
Positional Accuracy

- Most frequently requested positional accuracy by Federal agencies is +/- 40 feet; however this only meets 34% of Federal requirements
- Overall most frequently requested positional accuracy is +/- 3 feet
- +/-7 feet accuracy would meet 76% of Federal, 73% of state, and 65% of overall requirements but only 44% of other organization requirements



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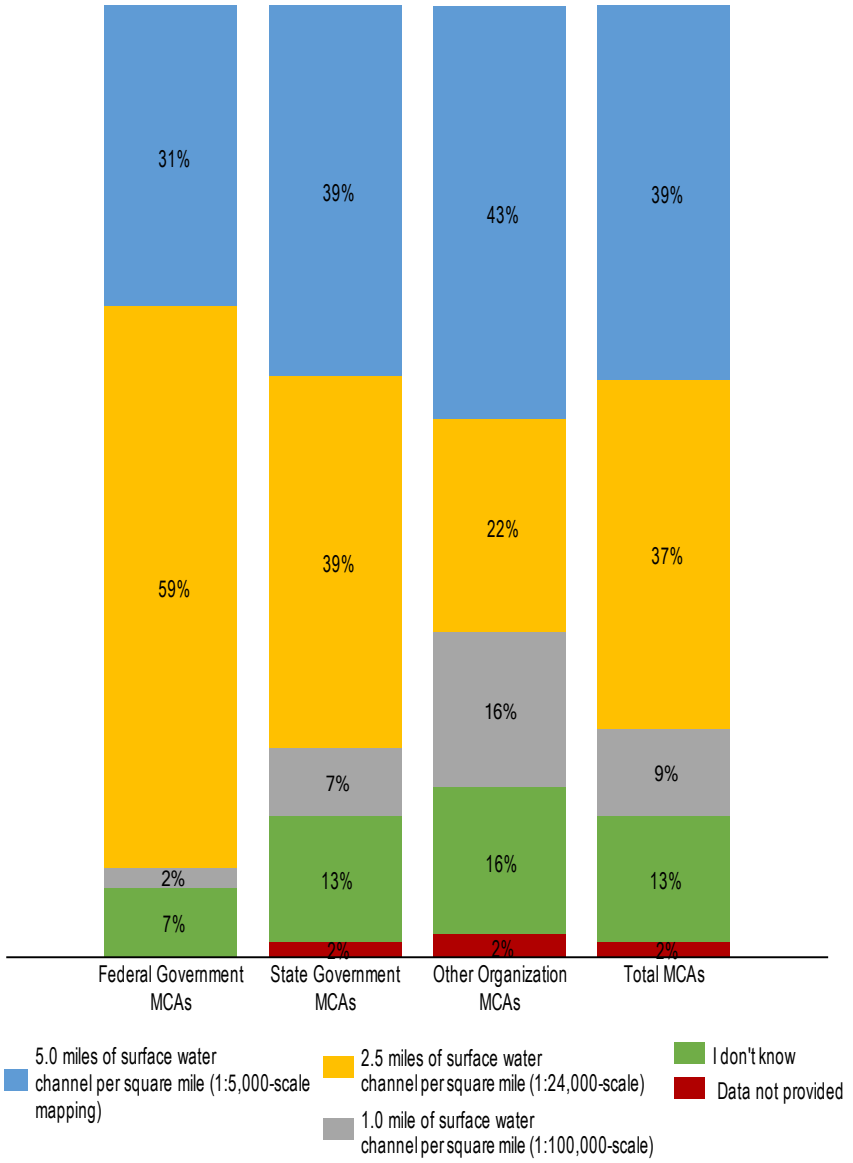
Stream Density

- Most frequently requested stream density by Federal agencies is 2.5 miles of channel/sq.mi.
- Overall most frequently requested stream density is 5.0 miles of channel/sq.mi.
- Stream density of 2.5 miles of channel/sq.mi. would meet 69% of Federal, 61% of state, and 61% of overall requirements



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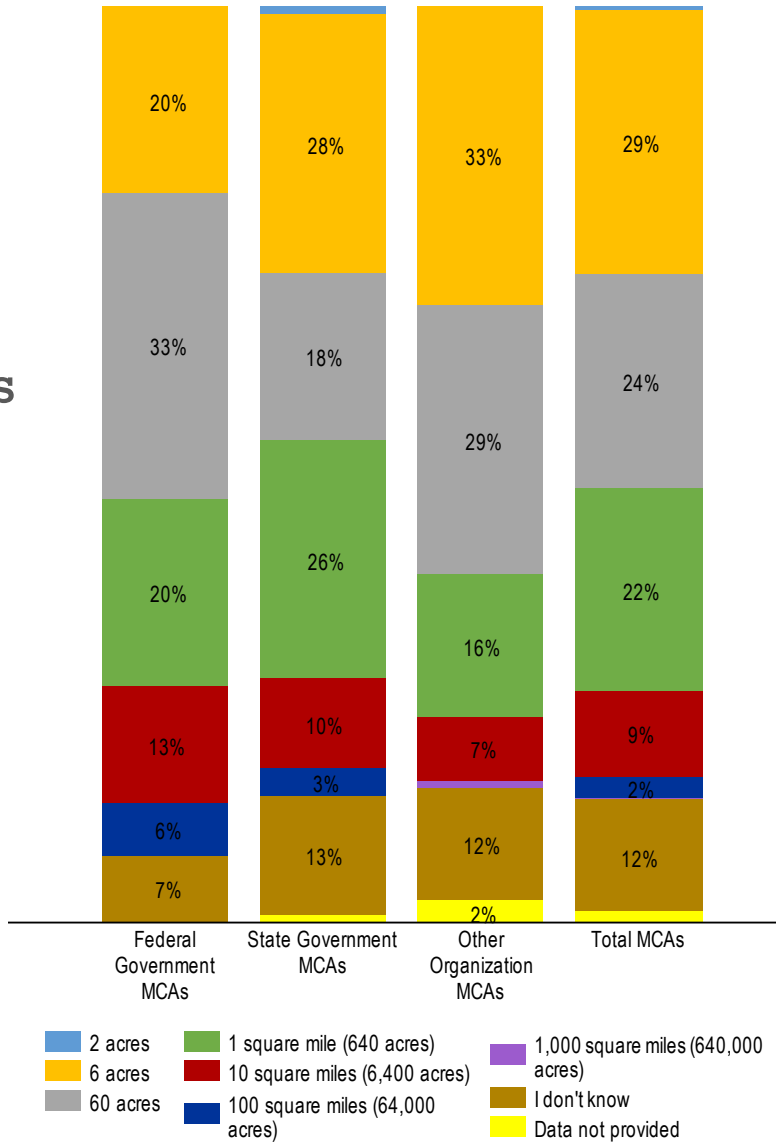
Smallest Contributing Watershed

- Most frequently requested smallest contributing watershed by Federal agencies is 60 acres
- Overall most frequently requested smallest contributing watershed is 6 acres
- Smallest contributing watershed of 60 acres would meet 80% of Federal, 71% of state, and 71% of overall requirements
- Smallest contributing watershed of 6 acres would meet 99.5% of overall requirements



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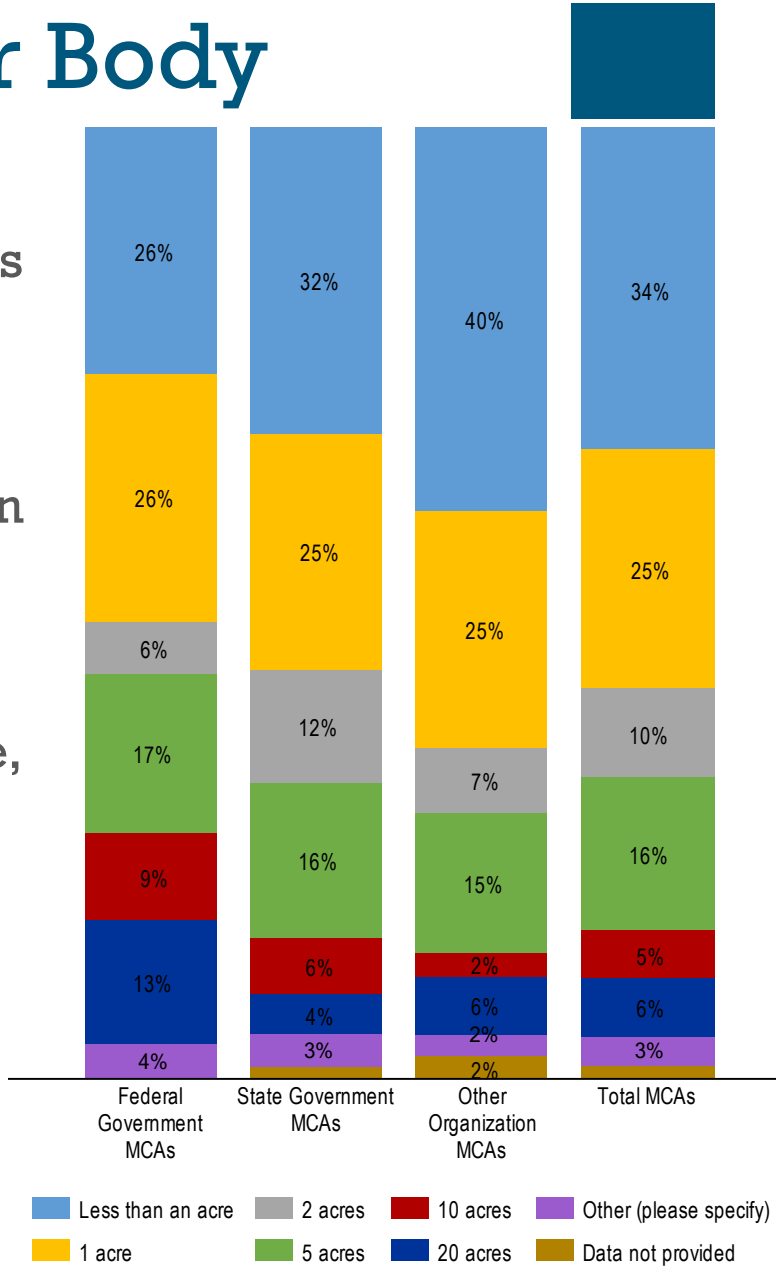
Smallest Mapped Water Body

- Most frequently requested smallest mapped water body by Federal agencies is tied at less than 1 acre and 1 acre
- Overall most frequently requested smallest mapped water body is less than 1 acre
- Smallest mapped water body of 1 acre would meet 74% of Federal, 68% of state, and 66% of overall requirements



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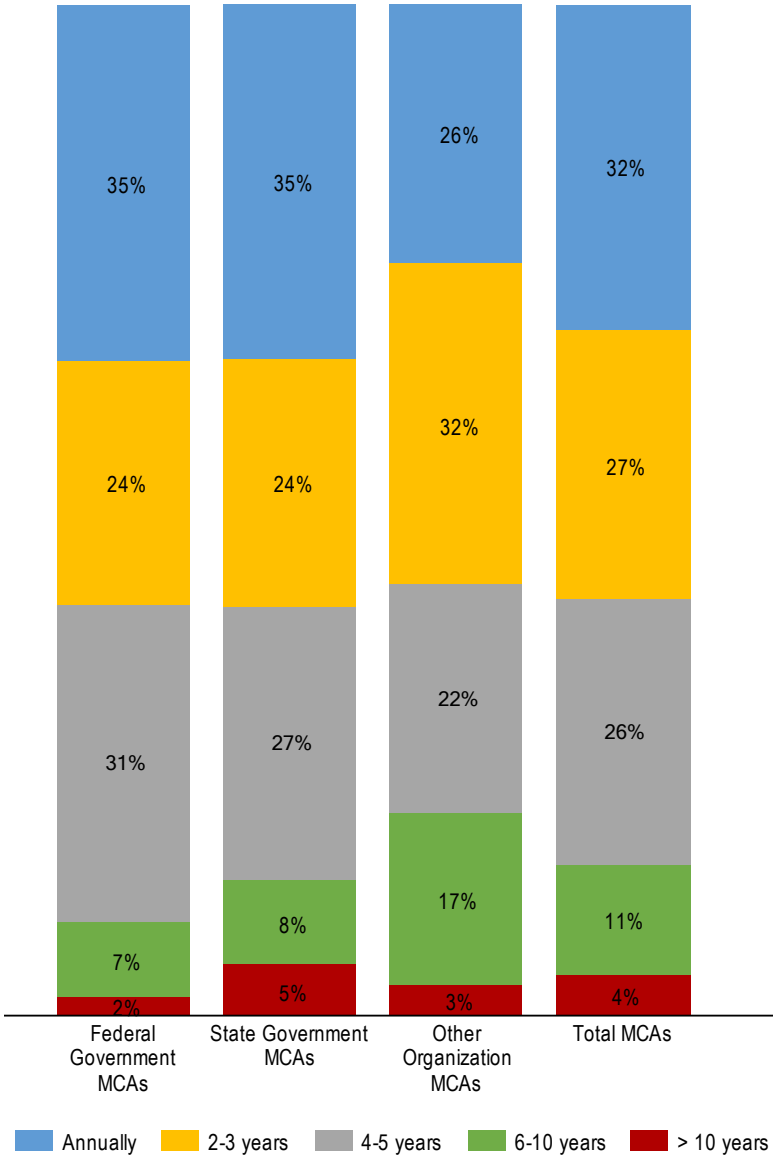
Update Frequency

- Most frequently requested update frequency is annually
- 2-3 year updates would meet 65% of Federal, 65% of state, and 68% of overall requirements



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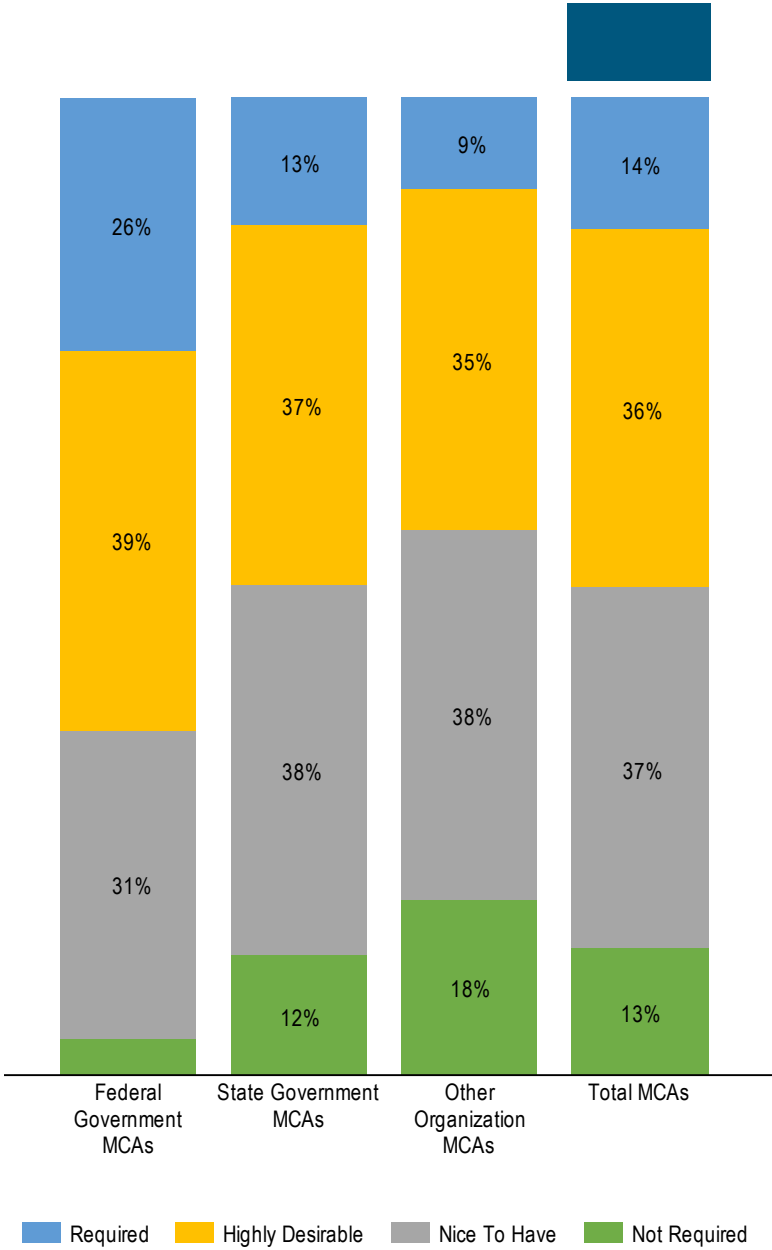
Post-Event Updates

- Most frequently reported response by Federal agencies is "Highly Desirable"
- Most frequently reported response by states and overall is "Nice to Have" (but only by a percentage point)



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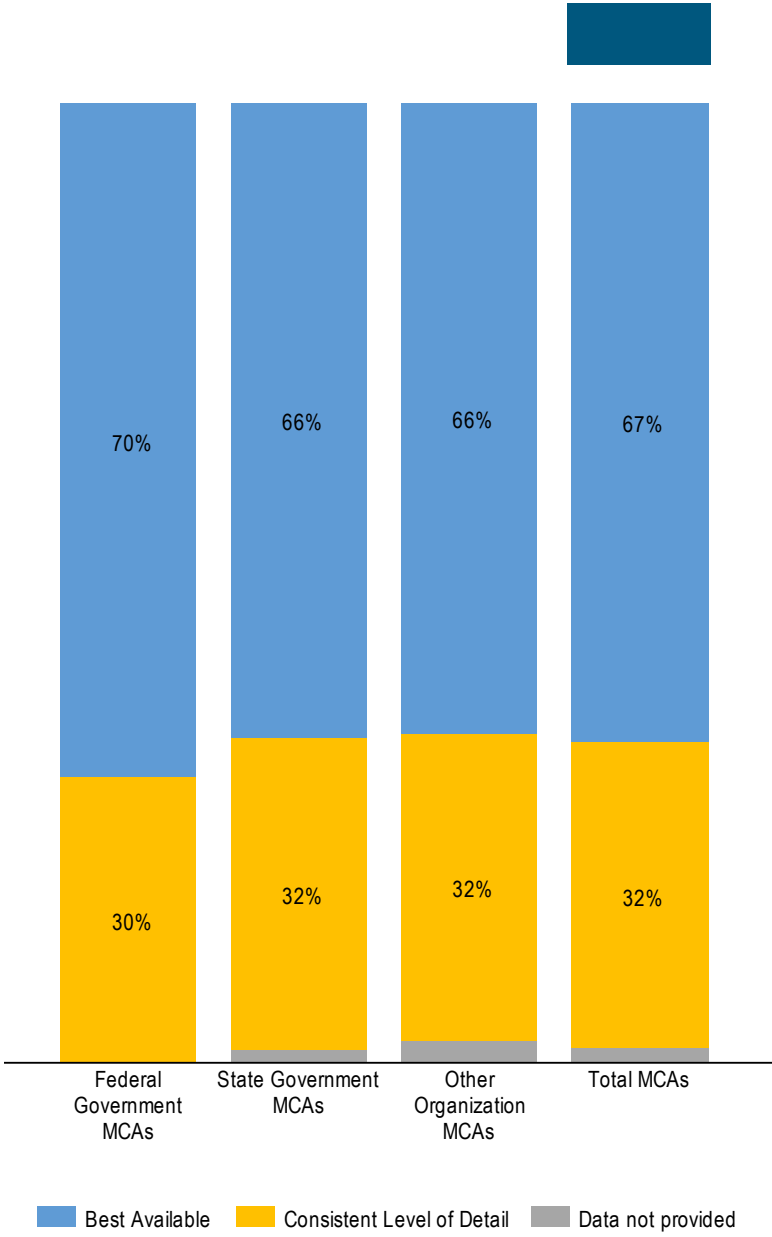
Level of Detail

- Most frequently reported response by all study participants is "Best Available"



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Required Features/Analytical Functions

Required Characteristics/Analytical Functions	Number of Federal Gov't. MCAs (of 54)	Percent of Federal Gov't. MCAs	Number of State Gov't. MCAs (of 23)	Percent of State Gov't. MCAs	Number of Other Org Type MCAs (of 129)	Percent of Other Org Type MCAs	Total Number of MCAs (of 420)	Percent of Total MCAs
Wetlands	47	87%	145	61%	77	60%	269	64%
Calculate drainage area	44	81%	183	77%	102	79%	329	78%
Flow periodicity	43	80%	149	63%	75	58%	267	64%
Linkages to stream gage observations	43	80%	156	66%	83	64%	282	67%
Delineate catchment	42	78%	146	62%	85	66%	273	65%
Find upstream or downstream feature	42	78%	157	66%	85	66%	284	68%
Left-right bank delineation	41	76%	105	44%	54	42%	200	48%
Floodplain boundary	40	74%	125	53%	93	72%	258	61%
Velocity or time of travel	40	74%	100	42%	60	47%	200	48%
Calculate stream distance to points	39	72%	146	62%	63	49%	248	59%

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Required Characteristics/Analytical Functions

- Top 10 of 35 shown
- Sorted on Federal requirements
- Wetlands data are most frequently required by Federal agencies
- Calculate drainage area is most frequently required by states and overall (2nd for Federal agencies)

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Integration with Other Datasets

- Top 5 for all study participants (in differing order):
  - Elevation
  - Stream flow
  - Wetlands
  - Soils
  - Land cover
- When "Required," most frequently needed to "Perform Geospatial Analysis"
- NWI also frequently needed for geospatial analysis

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Non-MCA Specific Requirements

- Elevation-hydrography data integration
  - Most frequently reported requirement is for hydrography to align with elevation data at 1:12,000-scale or larger
- Raster elevation-hydrography data integration
  - Most frequently reported requirement is to determine new flow paths across land surface into existing channels
- Other requirements
  - Elevation-derived catchments need to be within 5% of actual area
  - Error resolution needs to be within 2-30 days
  - 82% would definitely or probably use a web-based tool to report errors

Benefits

- Annual estimates for 420 MCAs
  - Program budgets: $18.5 to $22.5 billion
  - Current annual benefits: $538 to $544 million
  - Future annual benefits: $602 to $605 million
- Estimates are likely underestimated:
  - Respondents unable to provide dollar estimates for current annual benefits for 46% of MCAs
  - Respondents unable to provide dollar estimates for future annual benefits for 35% of MCAs
- Where range of values was provided, lower value is used

Benefits by Organization Type

Organization Type	Total Number of MCAs	Estimated Annual Program Budget	Estimated Current Annual Benefits	Estimated Future Annual Benefits
Federal Agencies and Commissions	54	$11.6 billion	$212 million	$308 million
Not for Profit	25	$74 million	$3 million	$27 million
Private or Commercial	16	$7 million	$1 million	$2 million
Regional, County, City or Other Local Government	80	$283 million	$137 million	$20 million
State Government	237	$6.5 billion	$185 million	$245 million
Tribal Government	8	$1 million	$205,500	$240,000
Total	420	$18.5 billion	$538 million	$602.5 million

Benefits by Business Use

BU	Business Use	Estimated Annual Program Budget	Estimated Current Annual Benefits	Estimated Future Annual Benefits	Weighted Qualitative Benefits
BU 1	River and Stream Flow Management	$763,580,000	$220,070,000	$154,730,000	243
BU 4	Water Quality	$1,672,410,000	$115,460,000	$121,480,000	511
BU 3	Water Resource Planning and Management	$988,880,000	$98,110,000	$115,880,000	393
BU 15	Flood Risk Management	$636,110,000	$56,130,000	$75,860,000	425
BU 5	River and Stream Ecosystem Management	$1,000,720,000	$13,960,000	$67,000,000	214
BU 2	Natural Resources Conservation	$6,956,800,000	$10,170,000	$17,760,000	214
BU 9	Wildlife and Habitat Management	$1,041,450,000	$180,000	$10,080,000	58
BU 20	Infrastructure and Construction Management	$1,088,720,000	$1,650,000	$8,730,000	139

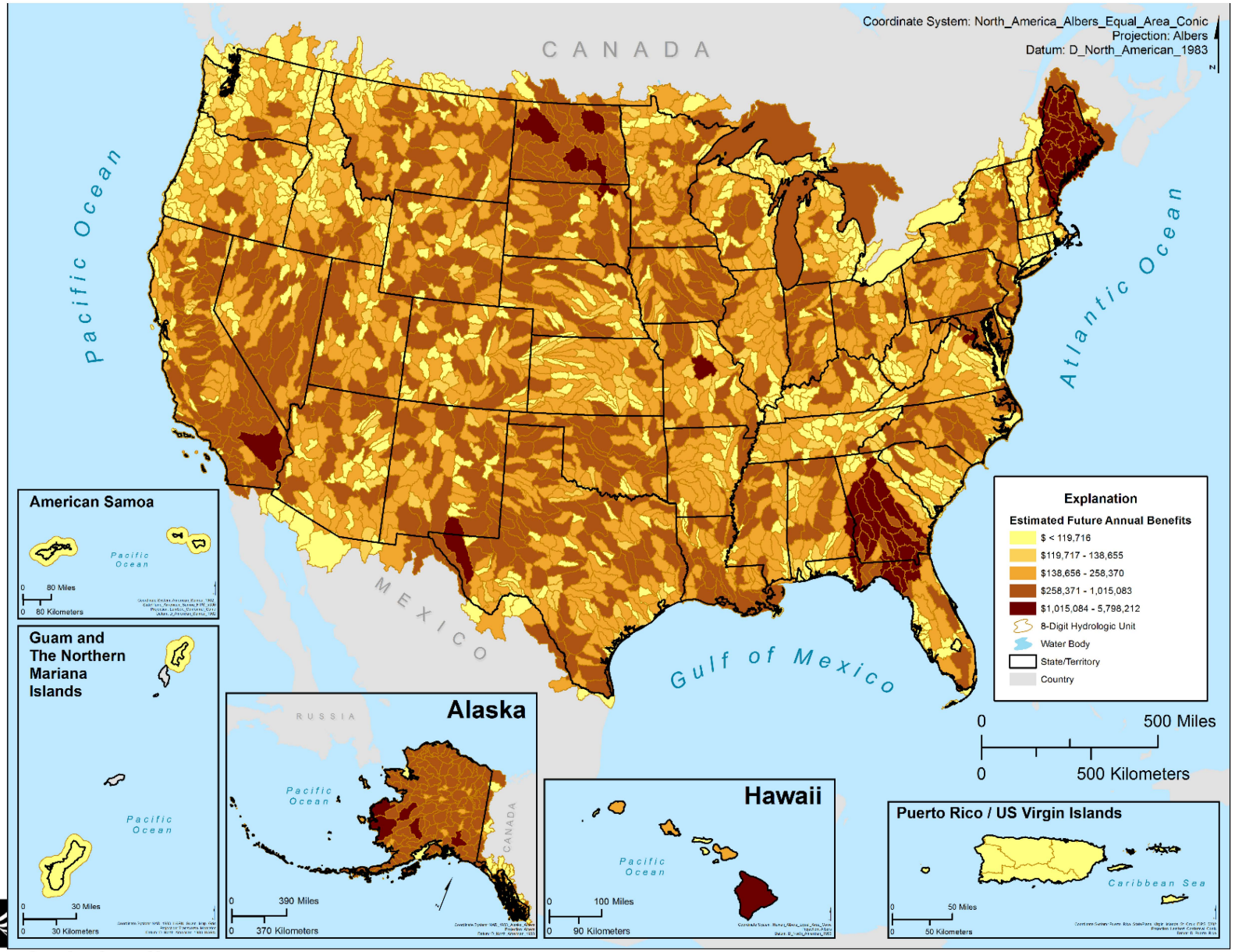
Benefits

- Ranking by qualitative benefits differs somewhat from ranking by estimated future annual dollar benefits

BU	Business Use Ranked by Future Annual Dollar Benefits
BU 1	River and Stream Flow Management
BU 4	Water Quality
BU 3	Water Resource Planning and Management
BU 15	Flood Risk Management
BU 5	River and Stream Ecosystem Management

BU	Business Use Ranked by Qualitative Benefits
BU 4	Water Quality
BU 15	Flood Risk Management
BU 3	Water Resource Planning and Management
BU 1	River and Stream Flow Management
BU 5	River and Stream Ecosystem Management

Total Benefits by HUC8



Need to understand cost of meeting requirements

- Experience in the NGTOC and elsewhere
- Pilot efforts
  - Five landscapes – humid, arid, rough, smooth, coastal + plain
  - Three levels of mapping
    - Improve positional accuracy of 24K feature content
    - Improve positional accuracy of 24K feature content AND add local-res (~1:4800) content
    - Attribution of linework/conflation
    - Two contractors
    - Level of effort reported for each step, and each landscape
- Weighing the benefits and costs to understand value will drive program recommendation

Summary of future direction

- What we know
  - Tighter agreement with elevation data
  - More frequent updates
    - Verifiable cycle/frequency
    - Probably linked to elevation updates
  - Key functionality
    - Catchment/watershed delineation
    - Upstream/downstream trace and feature discovery
    - Attribute accumulation/summary
- What we don't know
  - Feature content standards (aka scale)
  - Capture technology
  - Conflation approach

Comments/Questions

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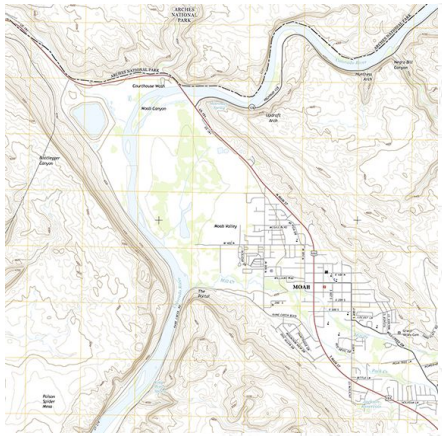
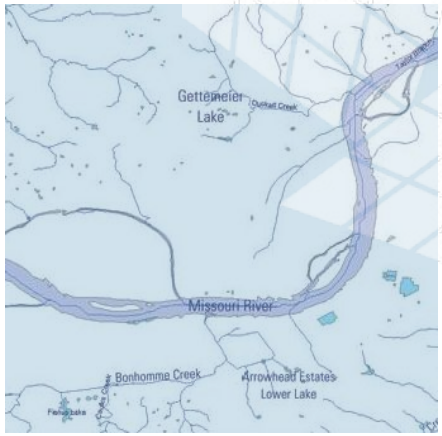
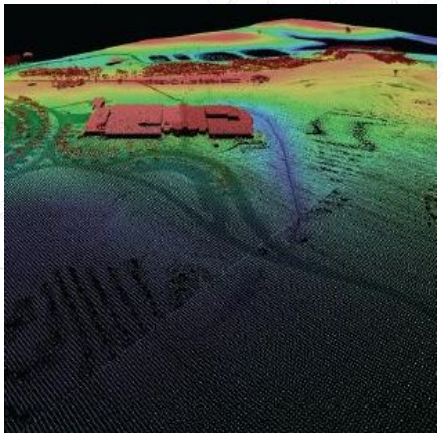
http://nationalmap.gov/HRBS.html

Hydrography's NHD & WBD Data Model 2.2.1 Roll out







Idaho Hydrologic Technical Working Group Meeting
9/08/2016

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The National Map
Your Source for Topographic Information

Elizabeth Stevens-Klein and Kristiana Elite

National Geospatial Technical Operations Center (NGTOC)

Agenda

- **NHD Model 2.2.1**
  - Where to find Data Model information
  - NHD - Summary of Data Model Changes
- **WBD Model 2.2.1**
  - Where to find Data Model information
  - WBD - Summary of Data Model Changes
- **Desktop Tool Status**
  - Check outs / Check in
- **NHD & WBD Distribution Status**
  - Distribution data currently in testing

Agenda

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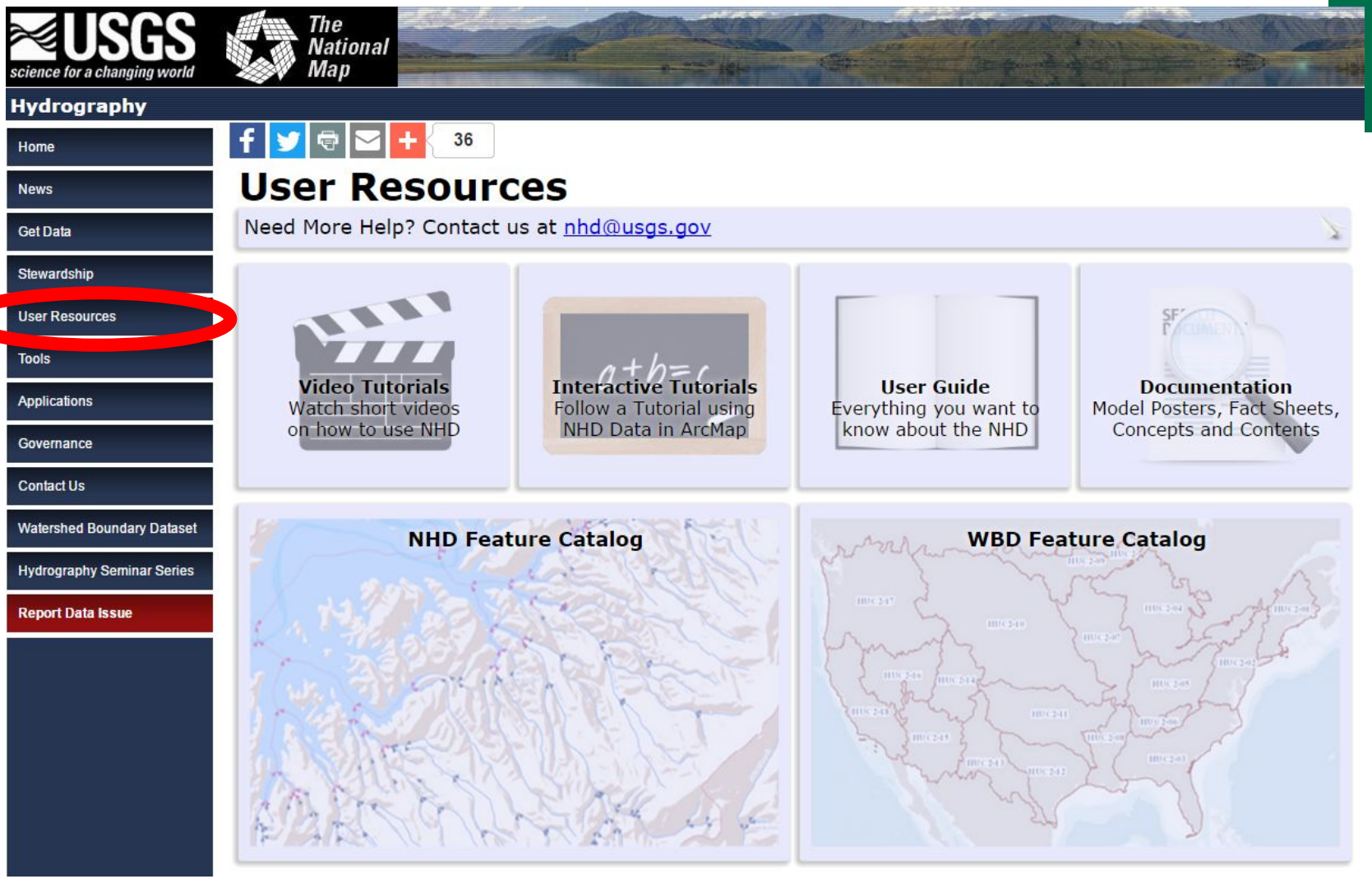
http://nhd.usgs.gov/



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The National Map
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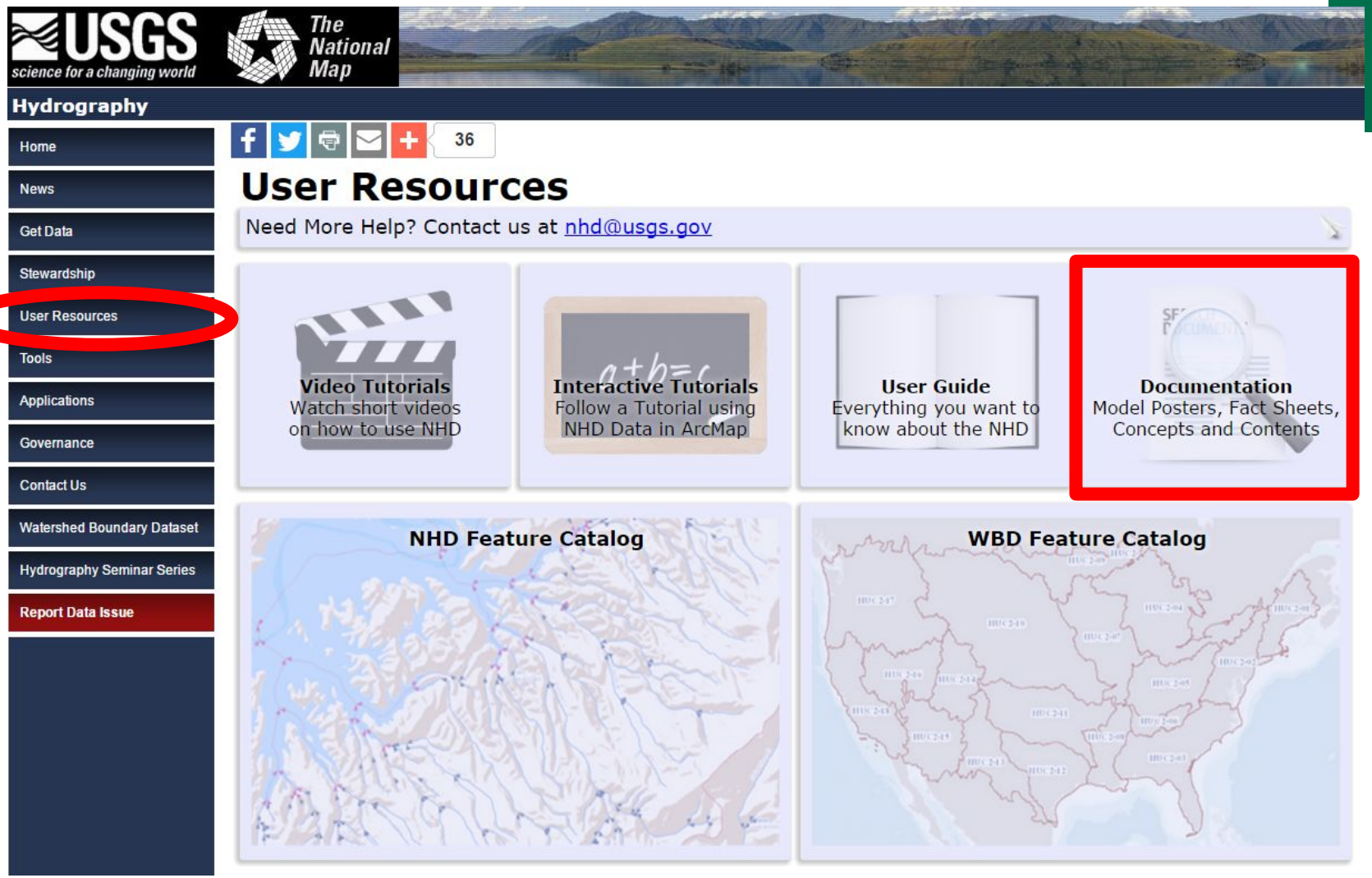

Hydrography

- Home
- News
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- Stewardship
- User Resources
- Tools
- Applications
- Governance
- Contact Us
- Watershed Boundary Dataset
- Hydrography Seminar Series
- Report Data Issue

NHD/ WBD Program Documentation

NHD Data Model (v2.2.1)

Diagram of the tables, the table items, the item definitions, and the relationships between the tables in the NHDinGEO data [illegible]

WBD Data Model (v2.2.1)

Diagram of the tables, the table items, the item definitions, and the relationships between the tables in the WBD data model.

NHD/WBD Frequently Asked Questions

TNM Hydrography Fact Sheet

A brief summary of the history and characteristics of the NHD, with additional information concerning obtaining, and maintaining the NHD.

TNM Hydrography Data Stewardship Fact Sheet

NHD Linear Referencing Fact Sheet

An informative description of how scientists store and link information to the NHD using a relational data design.

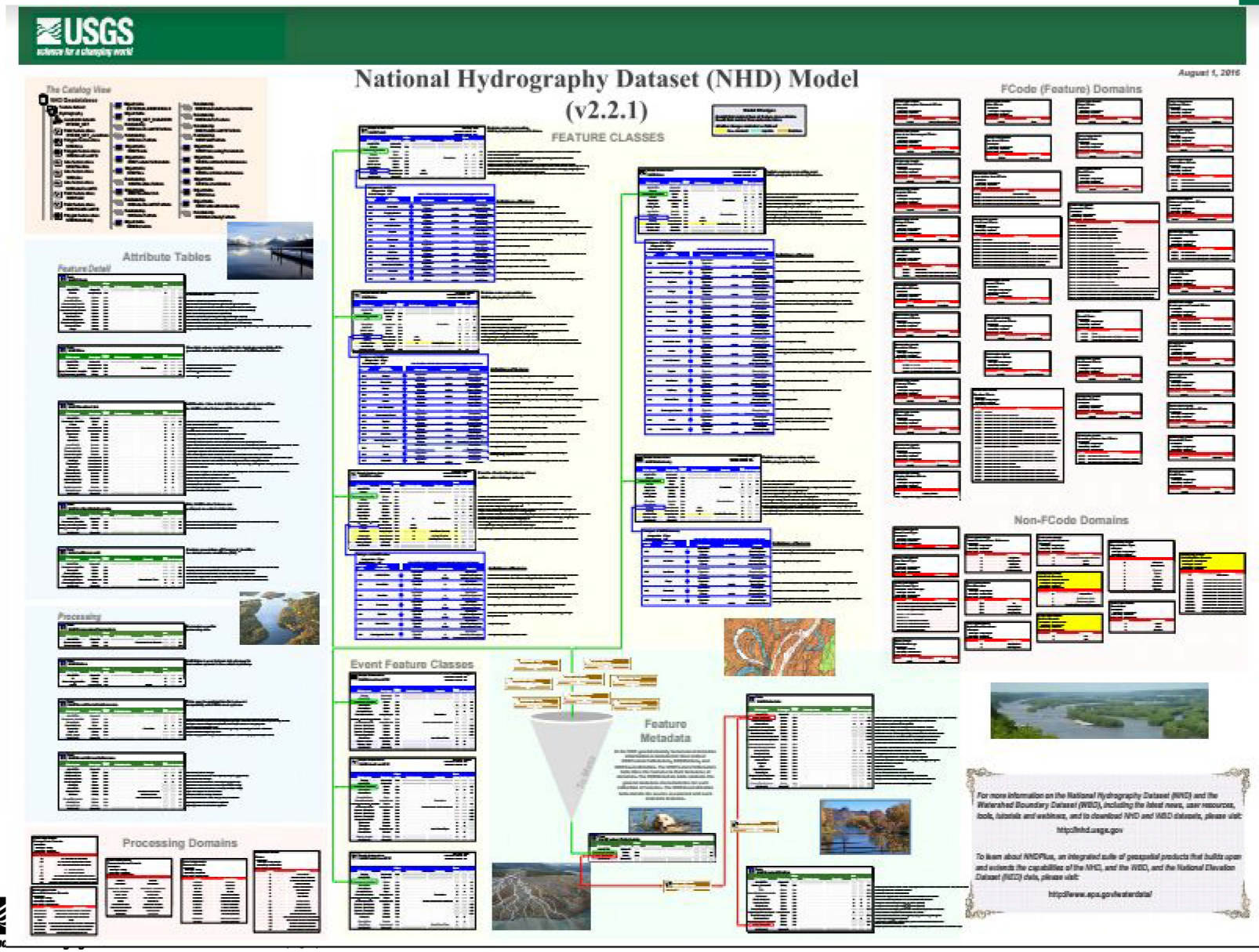
NHD Standards

Defines features, feature attributes, attribute values, delineation, representation rules, and data extraction for the National Hydrography Dataset-High Resolution (NHD-HR) at scales at 1:100,000 or larger.

WBD Standards

This document contains standards and specifications for WBD data. It also includes discussion of objectives, communications required for revising the data resolution in the United States and the Caribbean, as well as final review and data-quality criteria.

NHD Model 2.2.1



3 New NHD Flowline Attributes

1. MainPath
2. InNetwork
3. VisibilityFilter

NHDFlowline: MainPath Attribute & Values

NHDFlowline feature class:

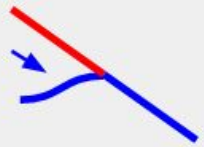
MainPath → MainPath Domain

Default = 0, AllowNulls = N

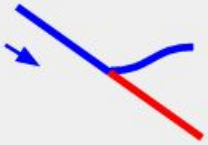
MainPath Domain

Values:

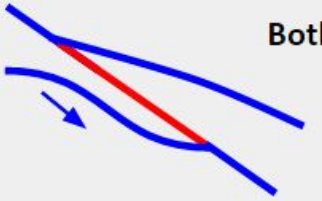
0	Unspecified [default value]
1	Confluence Main
2	Divergence Main
3	Both Confluence Main and Divergence Main



Confluence Main -
Feature participates in a confluence and is the mainpath upstream from the confluence.



Divergence Main -
Feature participates in a divergence (flow split) and is the mainpath downstream from the divergence.



Both Confluence Main & Divergence Main -
Feature participates in a confluence and a divergence (flow split) and is the mainpath upstream of the confluence and the mainpath downstream from the divergence.

NHDFlowline: InNetwork Attribute & Values

NHDFlowline feature class:

InNetwork → NoYes Domain

Default = 0, AllowNulls = Y

NoYes Domain

0	No
1	Yes

VisibilityFilter - Attribute (Field)

*A new attribute **VisibilityFilter** will be added to all TNM vector themes to allow for filtering of features for usage of vector data at approximate scales. NHD will be the first of the vector themes to include this field.*

VisibilityFilter field was added to the following Hydrography feature classes:

- NHDFlowline
- NHDLine
- NHDArea
- NHDWaterbody

Default = 0 (Unspecified), AllowNulls = N

VisibilityFilter - Values (Domain)

Code	Value	Description
0	Unspecified [default value]	Objects with a Visibility Attribute = 0 have not been evaluated
4800	Approximately 1:4,800 or Larger Scale	Objects with a Visibility Attribute = 4800 indicates that it is not appropriate to use the object at scales smaller than approximately 1:4,800 (i.e. object should be pruned at scales smaller than 1:4,800)
12500	Approximately 1:12,500 or Larger Scale	Objects with a Visibility Attribute = 12500 indicates that it is not appropriate to use the object at scales smaller than approximately 1:12,500 (i.e. object should be pruned at scales smaller than 1:12,500)
24000	Approximately 1:24,000 or Larger Scale	Objects with a Visibility Attribute = 24000 indicates that it is not appropriate to use the object at scales smaller than approximately 1:24,000 (i.e. object should be pruned at scales smaller than 1:24,000)
50000	Approximately 1:50,000 or Larger Scale	Objects with a Visibility Attribute = 50000 indicates that it is not appropriate to use the object at scales smaller than approximately 50,000 (i.e. object should be pruned at scales smaller than 1:50,000)
100000	Approximately 1:100,000 or Larger Scale	Objects with a Visibility Attribute = 100000 indicates that it is not appropriate to use the object at scales smaller than approximately 1:100,000 (i.e. object should be pruned at scales smaller than 1:100,000)
150000	Approximately 1:150,000 or Larger Scale	Objects with a Visibility Attribute = 150000 indicates that it is not appropriate to use the object at scales smaller than approximately 1:150,000 (i.e. object should be pruned at scales smaller than 1:150,000)
250000	Approximately 1:250,000 or Larger Scale	Objects with a Visibility Attribute = 250000 indicates that it is not appropriate to use the object at scales smaller than approximately 1:250,000 (i.e. object should be pruned at scales smaller than 1:250,000)
500000	Approximately 1:500,000 or Larger Scale	Objects with a Visibility Attribute = 500000 indicates that it is not appropriate to use the object at scales smaller than approximately 1:500,000 (i.e. object should be pruned at scales smaller than 1:500,000)
1000000	Approximately 1:1,000,000 or Larger Scale	Objects with a Visibility Attribute = 1000000 indicates that it is not appropriate to use the object at scales smaller than approximately 1:1,000,000 (i.e. object should be pruned at scales smaller than 1:1,000,000)
2000000	Approximately 1:2,000,000 or Larger Scale	Objects with a Visibility Attribute = 2000000 indicates that it is not appropriate to use the object at scales smaller than approximately 1:2,000,000 (i.e. object should be pruned at scales smaller than 1:2,000,000)
5000000	Approximately 1:5,000,000 or Larger Scale	Objects with a Visibility Attribute = 5000000 indicates that it is not appropriate to use the object at scales smaller than approximately 1:5,000,000 (i.e. object should be pruned at scales smaller than 5,000,000)

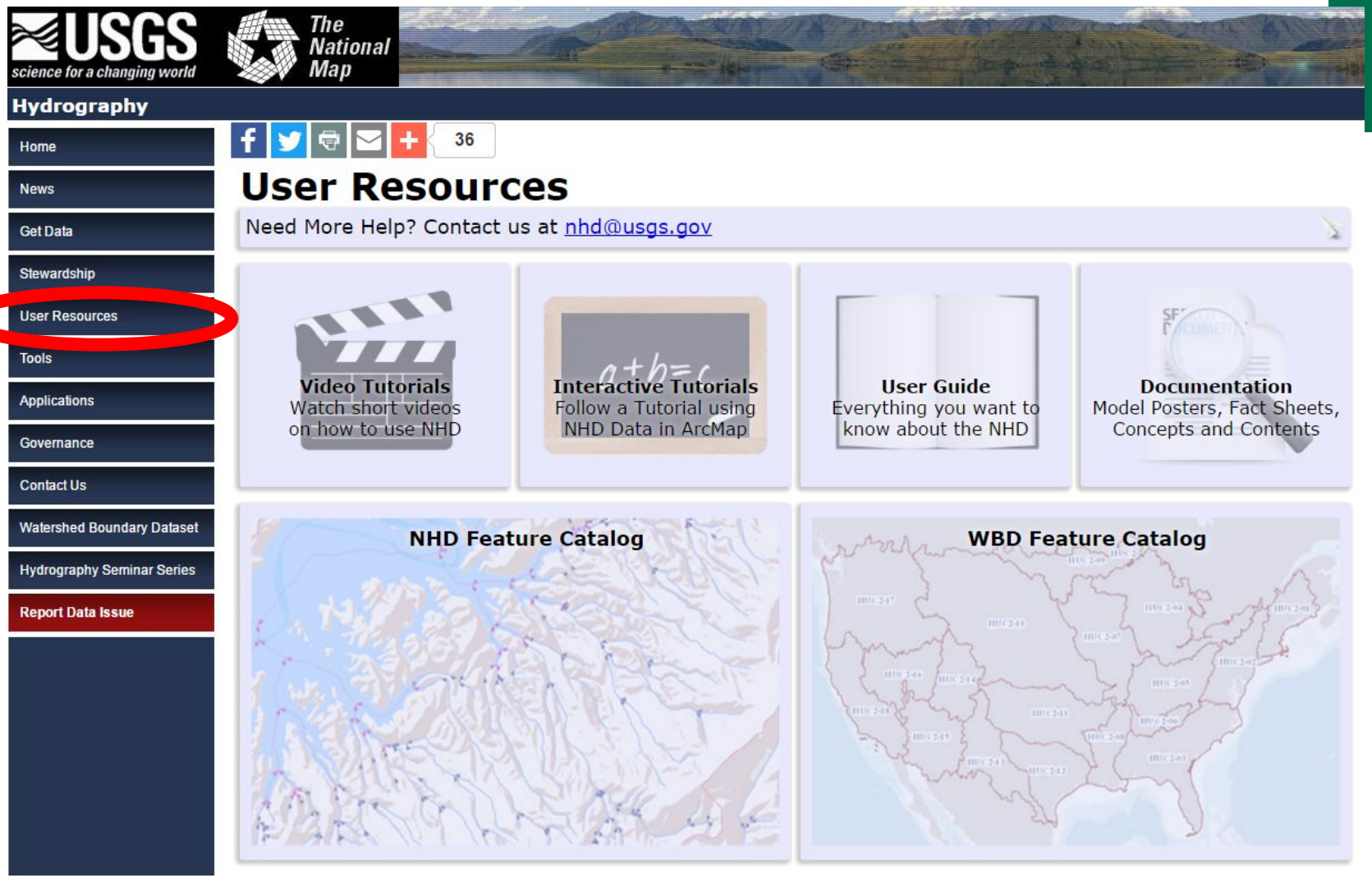
Using the VisibilityFilter Field

OBJE	Shape *	Permanent	FDate	Res	GNIS_ID	GNIS_Name	LengthK	ReachCode	FlowDir	WBAre	FType	FCode	Enab	VisibilityFilter	Shape_Length
58	Polyline ZM	142805850	3/7/2012	High	<Null>	<Null>	0.021	01010002001239	WithDigitize	142806	ArtificialPath	Artificial Pa	True	2000000	0.000195
59	Polyline ZM	142805130	3/7/2012	High	0056358	Caron Brook	0.041	01010002001234	WithDigitize	<Null>	StreamRiver	Stream/Riv	True	5000000	0.000505
60	Polyline ZM	142804495	3/7/2012	High	<Null>	<Null>	1.976	01010002001487	WithDigitize	<Null>	StreamRiver	Stream/Riv	True	24000	0.019576
61	Polyline ZM	142804943	3/7/2012	High	<Null>	<Null>	2.39	01010002000639	WithDigitize	<Null>	StreamRiver	Stream/Riv	True	24000	0.026444
62	Polyline ZM	142805845	3/7/2012	High	<Null>	<Null>	0.52	01010002000666	WithDigitize	142806	ArtificialPath	Artificial Pa	True	24000	0.006082
63	Polyline ZM	142805853	3/7/2012	High	<Null>	<Null>	0.014	01010002001248	WithDigitize	142806	ArtificialPath	Artificial Pa	True	24000	0.000148
64	Polyline ZM	142804410	3/7/2012	High	<Null>	<Null>	0.021	01010002001202	WithDigitize	<Null>	StreamRiver	Stream/Riv	True	24000	0.00028
65	Polyline ZM	142805074	3/7/2012	High	<Null>	<Null>	2.585	01010002001150	WithDigitize	<Null>	StreamRiver	Stream/Riv	True	24000	0.026789
66	Polyline ZM	142805660	3/7/2012	High	0056891	Johnson Broo	0.029	01010002000027	WithDigitize	142806	ArtificialPath	Artificial Pa	True	100000	0.000335
67	Polyline ZM	142806182	3/7/2012	High	<Null>	<Null>	0.191	01010002001670	WithDigitize	142806	ArtificialPath	Artificial Pa	True	24000	0.002283
68	Polyline ZM	142805783	8/20/2013	High	0056682	Glazier Brook	0.05322	01010002002073	WithDigitize	{909232	ArtificialPath	Artificial Pa	True	250000	0.000669
69	Polyline ZM	142805778	8/20/2013	High	0056117	Allagash River	0.40242	01010002000963	WithDigitize	{909232	ArtificialPath	Artificial Pa	True	5000000	0.003667

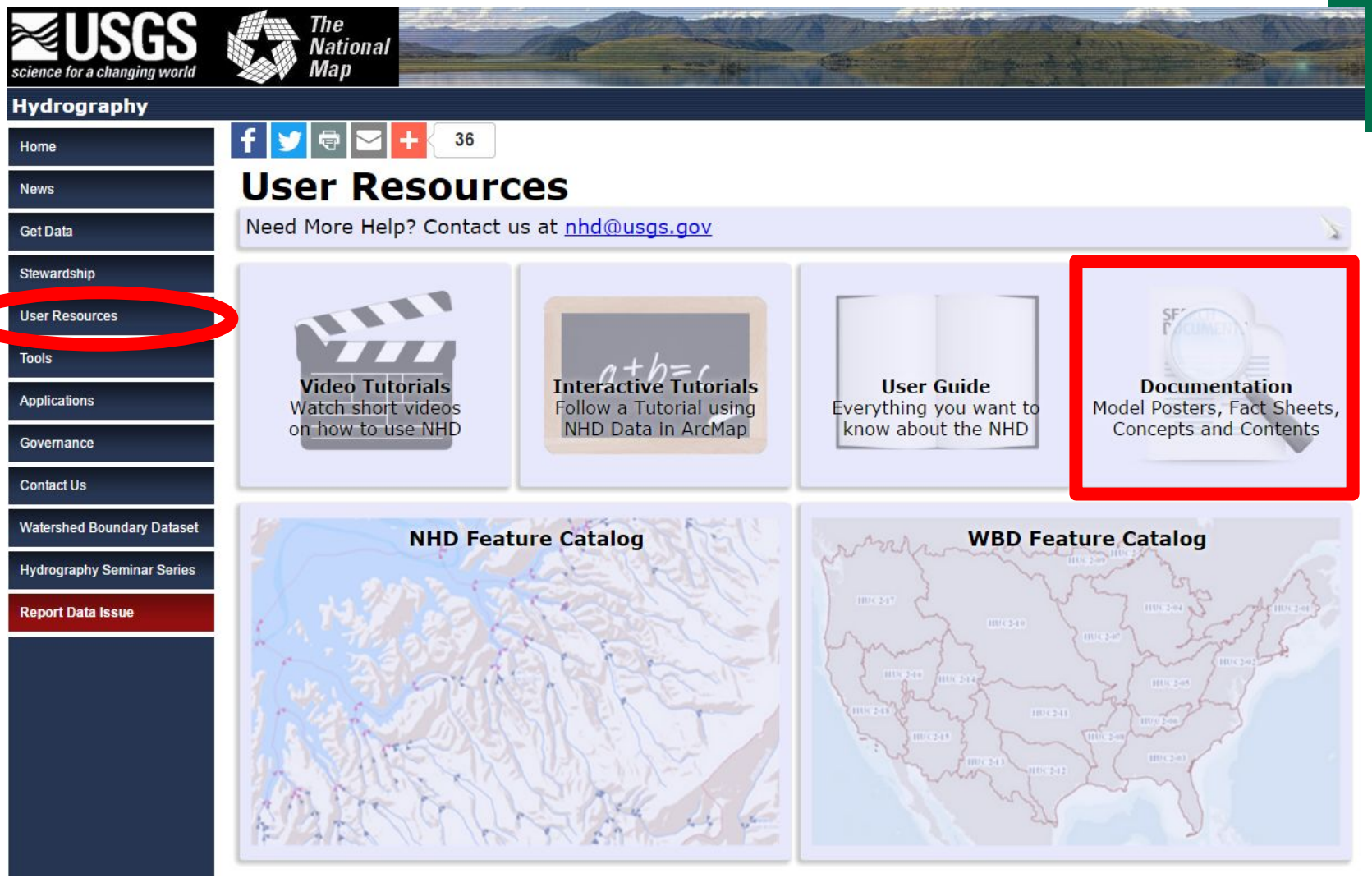
Agenda

- **NHD Model 2.2.1**
  - Where to find Data Model information
  - NHD - Summary of Data Model Changes
- **WBD Model 2.2.1**
  - Where to find Data Model information
  - WBD - Summary of Data Model Changes
- **Desktop Tool Status**
  - Check outs / Check in
- **NHD & WBD Distribution Status**
  - Distribution data currently in testing

http://nhd.usgs.gov/



http://nhd.usgs.gov/



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Hydrography Seminar Series
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NHD/ WBD Program Documentation

NHD Data Model (v2.2.1)

Diagram of the tables, the table items, the item definitions, and the relationships between the tables in the NHDinGEO data

WBD Data Model (v2.2.1)

Diagram of the tables, the table items, the item definitions, and the relationships between the tables in the WBD data model.

NHD/WBD Frequently Asked Questions

TNM Hydrography Fact Sheet

A brief summary of the history and characteristics of the NHD, with additional information concerning obtaining, and maintaining the NHD.

TNM Hydrography Data Stewardship Fact Sheet

NHD Linear Referencing Fact Sheet

An informative description of how scientists store and link information to the NHD using a relational data design.

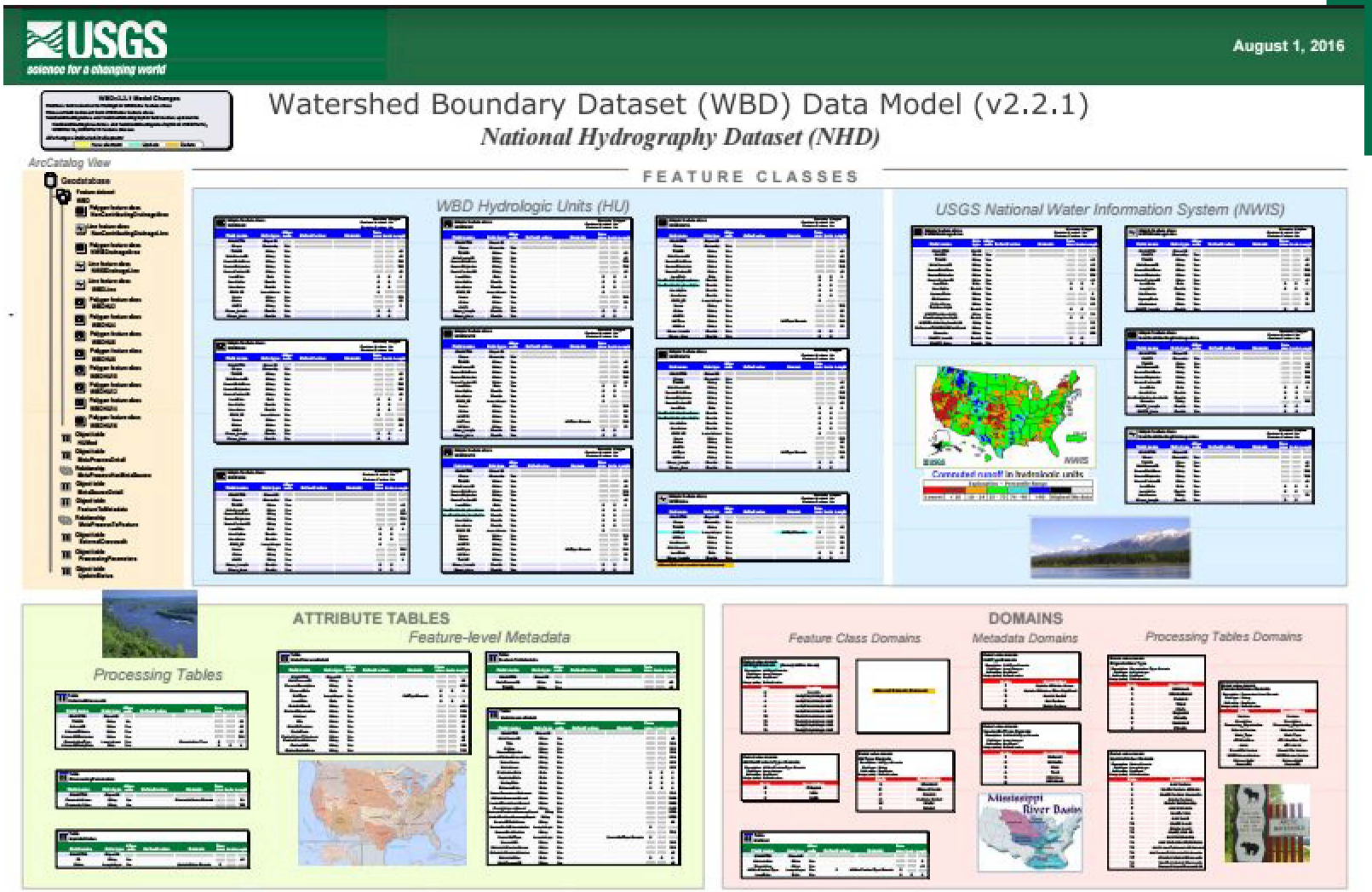
NHD Standards

Defines features, feature attributes, attribute values, delineation, representation rules, and data extraction for the National Hydrography Dataset-High Resolution (NHD-HR) at scales at 1:100,000 or larger.

WBD Standards

This document contains standards and specifications for WBD data. It also includes discussion of objectives, communications required for revising the data resolution in the United States and the Caribbean, as well as final review and data-quality criteria.

+WBD Model 2.2.1



WBD Model 2.2.1 Summary of Changes

HU12, HU14, HU16 - Feature classes

Rename fields:

NonContributingAcres to NonContributingAreaAcres

NonContributingSqKm to NonContributingAreaSqKm

WBDLine - Feature class

Rename fields:

HUClass to 'HUDigit'

HUClass Domain to HUDigit Domain.

Remove field:

HULevel (Field)

HULevel Domain

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Hydrography Tools - Status

- **NHD Update Tool**
  - **Current tool (Arc 10.2.2)** Version #6.2.1.23
    - Checkout (NHD 2.2.1 and WBD 2.2)
  - **New Tool (Arc 10.3.1)** Version #6.3.0.11
    Released 9/1/16
    - Checkouts post 9/30/16 (NHD 2.2.1 & WBD 2.2.1)
    - Data Reviewer has changed

- **WBD Editor Tool**
  - **New Tool (Arc 10.3.1)** Version # 2.3.2.5
    - Checkout (WBD 2.2.1 and NHD 2.2.1)

Agenda

- **NHD Model 2.2.1**
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Questions….

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estevens-klein@usgs.gov

Kristiana Elite
keelite@usgs.gov

Using the VisibilityFilter Field

EXAMPLE:

If you wanted to select 1:250,000- Scale features:

"VisibilityFilter" >= 250,000

Scale = 250,000K AND All smaller scales

Code	Description
0	Unspecified [default value]
4800	Approximately 1:4,800 or Larger Scale
12500	Approximately 1:12,500 or Larger Scale
24000	Approximately 1:24,000 or Larger Scale
50000	Approximately 1:50,000 or Larger Scale
100000	Approximately 1:100,000 or Larger Scale
150000	Approximately 1:150,000 or Larger Scale
250000	Approximately 1:250,000 or Larger Scale
500000	Approximately 1:500,000 or Larger Scale
1000000	Approximately 1:1,000,000 or Larger Scale
2000000	Approximately 1:2,000,000 or Larger Scale
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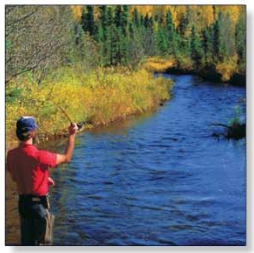
150000	Approximately 1:150,000 or Larger Scale
250000	Approximately 1:250,000 or Larger Scale
500000	Approximately 1:500,000 or Larger Scale
1000000	Approximately 1:1,000,000 or Larger Scale
2000000	Approximately 1:2,000,000 or Larger Scale
5000000	Approximately 1:5,000,000 or Larger Scale

Event Data

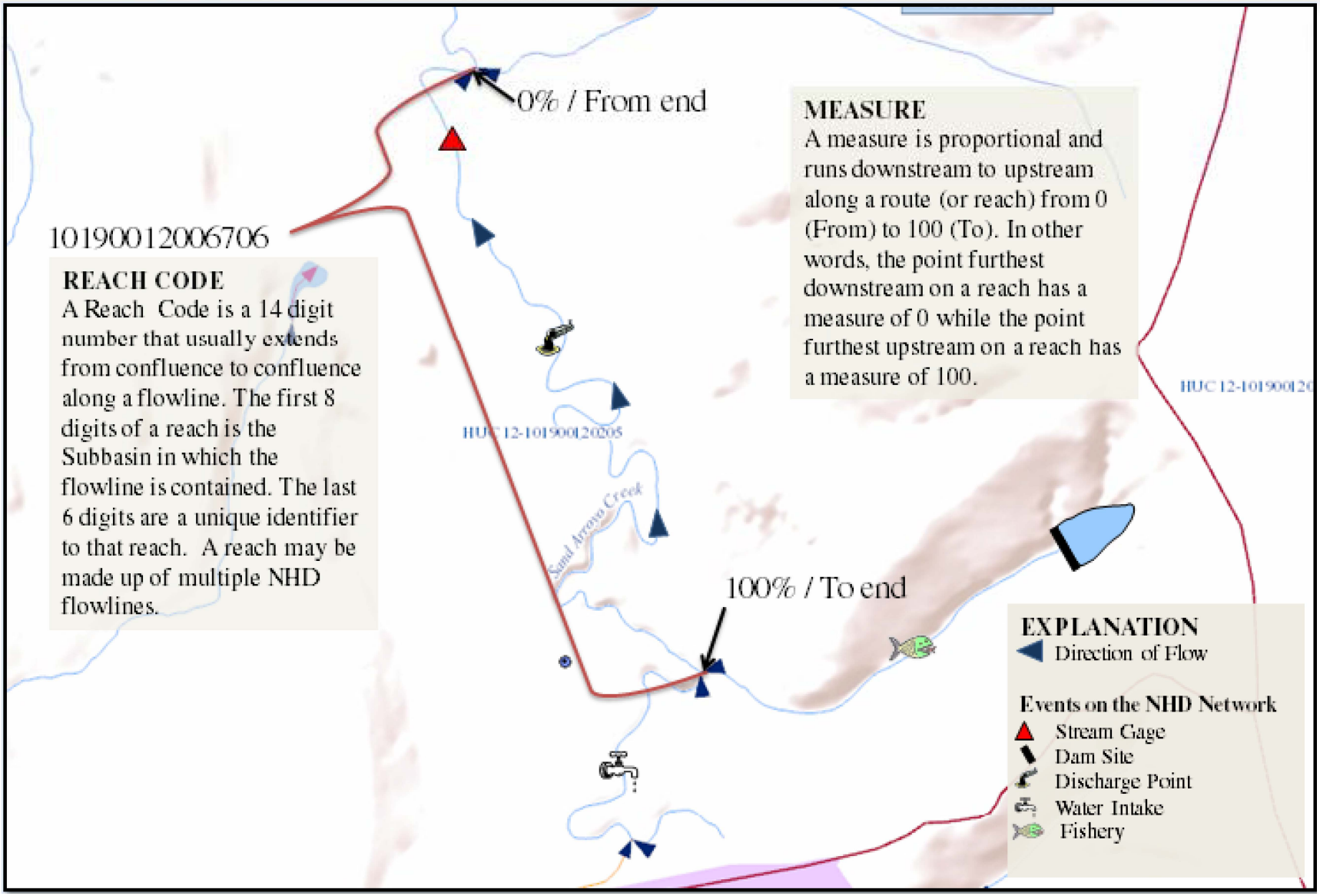


Events

•Events are a method of storing distance or temporal data associated with linear features.

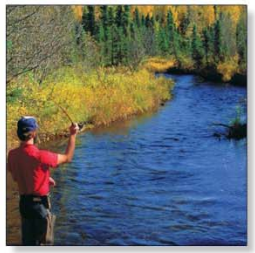
•NHD can hold linear, point, or poly events

•NHD currently has point events in the national dataset – in Idaho they consist of Dams, Flow alterations, HU outlets, stream gages, and water quality stations

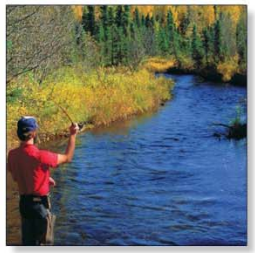


From http://nhd.usgs.gov/userguide.html

USGS tools

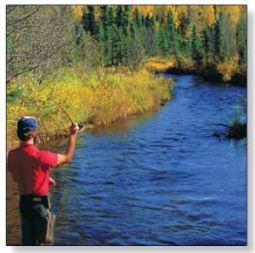


- Hydrography Event Management Tool (HEM)
- Tools and User Support as well as training from Hem@usgs.gov
- http://nhd.usgs.gov/tools.html has information on the tools as well as training materials.
- HEM EPA Add-on Tools



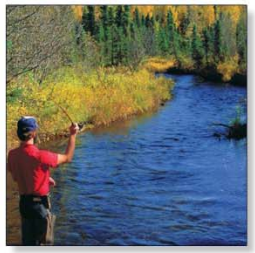
How other states are using events

- Oregon would like to add water right point of diversion data (POD)
- WA has 37,000 (POD's) mapped to the NHD, although they only upload about 345 to the USGS
- WA also has other data that is mapped to the NHD such as – shoreline management act (shorelines of statewide significance) that can be used as linear events



Suggestions

- Major diversions – such as ones associated with large canals
- Linear events such as wild and scenic rivers, state protected rivers,
- Fish screens or barriers



- What do we want to keep as a state?
- Where will it be stored / shared?
- How will it be updated?
- What will be uploaded to the national dataset?

EPA RAD

- https://www.epa.gov/waterdata/nhd-event-data-dictionary