

# Water-Inland Theme FY17 Implementation Plan Report

Theme Personnel	
<b>Theme Lead (Co-Leads):</b>	Becci Anderson, Megan Lang
<b>Theme Lead Agency(ies):</b>	DOI-USGS, DOI-USFWS
<b>Executive Theme Champion(s):</b>	Thomas (Tod) Dabolt
<b>Executive Champion Agency(ies):</b>	DOI

Water-Inland Theme NGDA Datasets	NGDA Agency
National Hydrography Dataset (NHD)	DOI-USGS
National Inventory of Dams	DOD-USACE
National Levee Database, series information for the current inventory of the Nation's levees	DOD-USACE
National Wetlands Inventory (NWI)	DOI-USFWS
Watershed Boundary Dataset (WBD)	DOI-USGS

**Theme Strategic Plan:**

[https://cms.geoplatform.gov/sites/default/files/a16waterinland/InlandWaterThemeStrategicPlan\\_20160630%28corrected%29.pdf](https://cms.geoplatform.gov/sites/default/files/a16waterinland/InlandWaterThemeStrategicPlan_20160630%28corrected%29.pdf)

**Human and Financial Resources Needed for Theme Management**

*This table includes an estimate of resources needed for managing the Theme and includes different activities, the roles that support them, as well as an estimated decimal FTE and grade. This estimate does not include the resources required for the agency to develop and maintain the NGDA Dataset(s) that make up the Theme to meet the agency's core mission requirements. At a minimum, only the first line of the table, which identifies the NGDA Theme Lead's Theme management activities, identified as a decimal FTE is required to be reported in this initial iteration of Theme Implementation Plan.*

Reporting Period for Human and Financial Resources<sup>1</sup>: 10/2016 – 3/2017

Description of Theme Management Activities	Role <i>(Theme Lead, co-Theme Lead, NGDA Coordinator, other as specified)</i>	FTE <sup>2</sup>	FTE Grade
A-16 NGDA Theme management (e.g., attend meetings, review NGDA documents,	Theme Co-Lead (USGS)	.20	14

<sup>1</sup> Reporting periods should align with the Oct 1 - Mar 31 and April 1 - Sep 30 submission dates.

<sup>2</sup> A full-time employee was available a maximum of 976 hours during the inclusive period of October 1 – March 31 or April 1 – September 30; assuming a Monday-Friday schedule with 8-hour workdays and not counting Federal Holidays. The FTE was determined by taking actual number of hours worked in support of Theme Management divided by 976 hours (per reporting period), rounded to the nearest 0.01)

develop Theme Strategic Plans, etc.)			
A-16 NGDA Theme management (e.g., attend meetings, review NGDA documents, develop Theme Strategic Plans, etc.)	Theme Co-Lead (USFWS)	.20	13

*[Instructions for the table below: Report Theme Strategic Plan goals and anticipated outcomes, objectives and Agency and/or stakeholders involved, and projected completion date. Describe all actions that will be taken to support the objective including milestones, performance indicators, and responsible party. Under the gray bar, list specific tasks/activities that have been undertaken by an Agency and/or Stakeholder during the identified reporting period by fiscal year. Repeat the table or portion of the table for each goal, each objective within a goal, and each action within an objective as needed.]*

<b>Goal 1:</b> Use results of the Hydrography Requirements and Benefits (HRBS) study to assess community needs and guide future programs to maximize the return on investment in meeting user needs.				
<b>Objective 1.1:</b> Complete development of a cost-benefit analysis for hydrographic data				
<b>Agency and/or Stakeholders Involved:</b> USGS				
<b>Anticipated Outcome:</b> Development of a program recommendation for future development of hydrographic data that maximizes user needs met				
<b>Actions</b>	<b>Milestones</b>	<b>Performance Indicators</b>	<b>Action Responsibility</b>	<b>Projected Completion Date</b>
1.1.1 Complete analysis of requirements and benefits data collected from the user community	1) Requirements and benefits data analysis completed	1) Percent of analyses completed	USGS National Geospatial Program (NGP)	FY17
1.1.2 Execute pilot projects to determine implementation costs to support cost-benefit comparison among multiple scenarios	1) Contracts for pilots executed	1) Percentage of pilot contracts executed	USGS NGP	FY17
1.1.3 Develop and document proposed program direction based on study results	1) Proposed program direction developed  2) Proposed program direction documented	1) Percentage of proposed program direction development completed  2) Percent of proposed program direction	USGS NGP	FY17

		documentation completed		
1.1.4 Vet proposed program direction with users/stakeholders to fine tune the approach	1) Outreach to users/stakeholders to solicit interest 2) Completion of proposed program vetting with users/stakeholders	1) Number of users/stakeholders contacted to solicit interest 2) Number and types of stakeholders groups approached to vet proposed program direction	USGS NGP, National Hydrography Dataset (NHD) Advisory Team, other users/stakeholders	FY18
1.1.5 Publish action plan for new program direction	1) Action plan published	1) Percentage completion of action plan publishing process	USGS NGP	FY19
<b>Agency and/or Stakeholder</b>		<b>Activity through FY 2017, Q1</b>		
USGS		1.1.1: Requirements and benefits study is 75% completed. Preliminary results are publicly available at <a href="http://nationalmap.gov/HRBS.html">http://nationalmap.gov/HRBS.html</a> .		
USGS		1.1.2: 100% of expected pilot projects contracts have been executed. Preliminary results are expected in FY17 Q2.		

<b>Goal 2: Improve and enrich capabilities/intelligence of the datasets</b>				
<b>Objective 2.1:</b> Using the NHD, WBD, and 10-meter seamless 3DEP elevation models as the source datasets, develop and implement the high-resolution (1:24,000 or better scale) NHDPlus as a foundational framework for georeferencing users' hydrologic and biologic observations for discovery and exploitation.				
<b>Agency and/or Stakeholders Involved:</b> USGS, states, tribes, academia, the private sector, other federal agencies, and localities				
<b>Anticipated Outcome:</b> The user community becomes unified on a single hydrography geospatial framework that is partially integrated with elevation, based on drainage enforcement; user observations become more interoperable				
<b>Actions</b>	<b>Milestones</b>	<b>Performance Indicators</b>	<b>Action Responsibility</b>	<b>Projected Completion Date</b>
2.1.1 Produce beta NHDPlusHR for nation	1) Production of NHDPlusHR Beta version	1) Number of Hydrologic Regions or Subregions completed	USGS NGP	FY19
2.1.2 Conduct QC efforts to improve the	1) Engagement of QC Teams	1) Number of QC Teams engaged	USGS NGP, states, tribes, academia, the private sector,	FY20

beta version in partnership with the community, including states, tribes, academia, the private sector, other federal agencies, and localities as possible	2) NHDPlusHR Beta version QC completed	2) Number of Hydrologic Regions or Subregions completed	other federal agencies, and localities	
2.1.3 Edit NHD and WBD source datasets to reflect QC findings	1) NHD and WBD source dataset QC edits applied	1) Number of Hydrologic Regions or Subregions completed	USGS NGP	FY20
2.1.4 Improve WBD and NHDPlusHR integration	1) WBD and NHDPlusHR vertically integrated	1) Number of Hydrologic Regions or Subregions completed	USGS NGP	FY21
2.1.5 Following QC and corrections of the beta version, quickly release Version 1.0 of NHDPlusHR	1) Release of NHDPlusHR Version 1.0 (or better)	1) Number of Hydrologic Regions or Subregions completed	USGS NGP	FY20
2.1.6 Maintain NHDPlusHR over the long term, incorporating edits and refreshing as needed, in partnership with states, tribes, academia, the private sector, other federal agencies, and localities through established stewardship programs	1) Markups of ingredient data used to refresh the NHDPlusHR 2.0 (based on change detection criteria)	1) Percentage of validated markups submitted by partners in stewardship programs that have been applied to NHDPlusHR	USGS NGP	FY21
2.1.7 Develop	1) Generalization	1) Number of	USGS NGP	FY19

methods and tools to generalize the NHDPlusHR flowline network and catchments to many different scales, while retaining feature identities, enabling linkages between scales.	tools and methods developed	Hydrologic Regions or Subregions with VisibilityFilter populated		
<b>Agency and/or Stakeholder</b>	<b>Activity through FY 2017, Q1</b>			
USGS	2.1.1: The National Hydrography Dataset Plus High Resolution (NHDPlusHR) beta version is proceeding on schedule with six Hydrologic Regions completed (06, 12, 14, 15, 01, 02), with three Hydrologic Regions currently in work (16, 10, 09). Completed data are being prepped for download and will be made available via The National Map ( <a href="http://nationalmap.gov/">http://nationalmap.gov/</a> ).			
USGS, states, tribes, academia, the private sector, other federal agencies, and localities	2.1.2: One QC Team of volunteers with hydrographic expertise and local knowledge is currently engaged and reviewing a Hydrologic Region (06). USGS is currently seeking volunteers to perform QC in one additional region (01) through communications, including the NHD Newsletter ( <a href="https://nhd.usgs.gov/newsletter_list.html">https://nhd.usgs.gov/newsletter_list.html</a> ) and NHD Advisory Team calls.			
<b>Objective 2.2:</b>				
<b>Agency and/or Stakeholders Involved:</b>				
<b>Anticipated Outcome:</b>				
<b>Actions</b>	<b>Milestones</b>	<b>Performance Indicators</b>	<b>Action Responsibility</b>	<b>Projected Completion Date</b>
2.2.1 Support and promote desktop Hydro Event Management (HEM) tool for the short term.	1) Maintain functionality of HEM Desktop tool	1) HEM Desktop tool available and functional for a majority of users	USGS NGP	FY18
2.2.2 Develop web-based HEM tools, transition from desktop HEM for the longer term.	1) Web-based HEM tool developed	1) Ability to create and maintain linked data (events) via web	USGS NGP	FY19
<b>Agency and/or</b>	<b>Activity through FY 2017, Q1</b>			

Stakeholder				
<p><b>Objective 2.3:</b> Develop integrated elevation and hydrography datasets based on high-accuracy 3DEP elevation data</p> <p><b>Agency and/or Stakeholders Involved:</b> USGS</p> <p><b>Anticipated Outcome:</b> Improved accuracy and interoperability of hydrography data; hydrography and elevation data are integrated and consistent and can be used together seamlessly in a multitude of applications that will improve our understanding of hydrologic processes</p>				
Actions	Milestones	Performance Indicators	Action Responsibility	Projected Completion Date
2.3.1 Research integrated data model for NHD, WBD, and 3DEP	1) Integrated NHD, WBD, 3DEP data model concept formulated	1) Percentage of model research completed	USGS NGP	FY19
2.3.2 Research methods to evaluate, delineate, and store non-contributing areas in WBD or NHDPlus	1) Methods for non-contributing areas concept formulated	1) Percentage of non-contributing area methods research completed	USGS NGP	FY19
2.3.3 Research methods to extract hydrography from 3DEP data	1) Methods for 3DEP hydrography extraction concepts formulated	1) Percentage completion for 3DEP hydrography extraction researched	USGS NGP	FY18
2.3.4 Research methods to automate or semi-automate WBD delineations from elevation so that WBD is composed of a collection of elevation-based catchments	1) Methods for WBD automation from elevation concepts formulated	1) Percentage completion for WBD automation from elevation researched	USGS NGP	FY18
2.3.5 Implement methods based on research results	1) Researched methods demonstrated in an operational environment	1) Percentage of accepted methods implemented	USGS NGP	FY19
Agency and/or		Activity through FY 2017, Q1		

<b>Stakeholder</b>				
USGS		2.3.4: Current research in Alaska (portions of HU4-1902) are moving forward with methods from Canadian partners being explored to solve delineation issues in areas of complex, braided channels.		
<b>Objective 2.4:</b> Improve NWI wetland code intelligence in the NWI data model				
<b>Agency and/or Stakeholders Involved:</b> USFWS				
<b>Anticipated Outcome:</b> Analytical capability is improved through NWI wetland codes linked to FGDC wetland definition and descriptions				
<b>Actions</b> <i>(Describe discrete activities)</i>	<b>Milestones</b> <i>(A significant change in development with associated date)</i>	<b>Performance Indicators</b> <i>(A metric to assess progress of the action)</i>	<b>Action Responsibility</b> <i>(Agency, individuals, and/or groups leading the action)</i>	<b>Projected Completion Date</b> <i>(FY)</i>
2.4.1 Develop parsed NWI wetland code tables	1) Parsed NWI wetland code tables developed	1) Percentage of identified wetland code tables revised	USFWS NWI, National Standards and Support Team	FY17
2.4.2 Develop NWI code interpreter	1) NWI code interpreter improved	1) Percentage of identified wetland code interpreter improvements made	USFWS NWI, National Standards and Support Team	FY17
2.4.3 Integrate parsed NWI code tables into data model	1) Parsed NWI code tables integrated into the data model	1) Percentage of revised code tables integrated within the database	USFWS NWI, National Standards and Support Team	FY19
2.4.4 Research integration of USACE wetland plant list to NWI wetland codes	1) Feasibility of integrating the USACE wetland plant list into NWI wetland codes determined	1) Feasibility of integration measured	USFWS NWI, National Standards and Support Team	FY19
<b>Agency and/or Stakeholder</b>		<b>Activity through FY 2017, Q1</b>		
USFWS		USFWS continually seeks to enhance the NWI dataset and related databases based on the latest scientific information and technological advances following the standards set-forth by the FGDC (ongoing).		
<b>Objective 2.5:</b> Refine methods for delineation of gaged drainage areas stored in the USGS National Water Information System (NWIS) from WBD.				
<b>Agency and/or Stakeholders Involved:</b> USGS				
<b>Anticipated Outcome:</b> Improved integration of spatial hydrography data with drainage areas stored in NWIS thus tying NWIS to the spatial component of the national water data framework.				
<b>Actions</b>	<b>Milestones</b>	<b>Performance Indicators</b>	<b>Action Responsibility</b>	<b>Projected Completion Date</b>
2.5.1 Develop improved toolsets for	1) Gaged drainage area delineation toolsets	1) Percentage of gaged drainage area delineation	USGS NGP	FY20

drainage area delineation	formulated	toolset development completed		
<b>Agency and/or Stakeholder</b>	<b>Activity through FY 2017, Q1</b>			

<b>Goal 3:</b> Continue building and strengthening the water data community with states, tribes, academia, the private sector, other federal agencies, and localities that meet the needs of users				
<b>Objective 3.1:</b> Investigate coordination and mutually beneficial activities between data sets				
<b>Agency and/or Stakeholders Involved:</b> USGS, USFWS, USACE				
<b>Anticipated Outcome:</b> Identify opportunities to leverage dataset resources and enhance dataset quality				
<b>Actions</b>	<b>Milestones</b>	<b>Performance Indicators</b>	<b>Action Responsibility</b>	<b>Projected Completion Date</b>
3.1.1 Continue meetings between theme dataset development teams	1) Theme dataset development teams meet quarterly, virtually or in person	1) Number of meetings held per year	USGS, USFWS, USACE	FY21
<b>Agency and/or Stakeholder</b>	<b>Activity through FY 2017, Q1</b>			
USGS, USFWS	3.1.1: Meetings between theme dataset development teams are ongoing, including two meetings in this reporting quarter (USGS/USFWS teleconference on 14 Nov 2016; USGS/USFWS in-person on 13 Dec 2016).			
<b>Objective 3.2:</b> Engage partners, stakeholders, and users by providing educational and discussion forums				
<b>Agency and/or Stakeholders Involved:</b> USGS NGP, USFWS				
<b>Anticipated Outcome:</b> Community members have opportunities to engage, learn, and share information, and to provide input to the ongoing improvement of the theme				
<b>Actions</b>	<b>Milestones</b>	<b>Performance Indicators</b>	<b>Action Responsibility</b>	<b>Projected Completion Date</b>
3.2.1 Continue education and collaboration activities including NHD Advisory team, WBD State Stewardship workgroup, Hydrography	1) Coordinated groups, meetings, workshops, presentations, and related educational and collaborative events held on their respective, regular schedules	1) Number of meetings, workshops, presentations, and related events held	USGS NGP, USFWS	FY21

Technical Exchange Meetings, Hydrography Seminar Series, and Wetlands Mapping Consortium				
3.2.2 Continue and expand, if possible, participation of staff in scientific Conferences	1) Staff participate (in-person, remotely, or by other means) in scientific conferences that disseminate theme-related information	1) Number of scientific conferences with theme-related participation	USGS NGP, USFWS	FY21
<b>Agency and/or Stakeholder</b>	<b>Activity through FY 2017, Q1</b>			
USGS NGP, USFWS	<p>3.2.1: The following educational and collaborative activities were held in this reporting period:</p> <ul style="list-style-type: none"> <li>• Three WBD State Stewardship workgroup meetings. Meetings are held monthly with minutes posted on the Hydrographic Data Community website under WBD Program Management (login required – contact David Anderson, danderson@usgs.gov)</li> <li>• Six Hydrography Technical Exchange Meetings covering both the NHD and WBD. Meetings are held regularly and posted to the Hydrographic Data Community website calendar (login required – contact David Anderson, danderson@usgs.gov)</li> <li>• Two NHD Advisory team meetings. Meetings are generally held twice monthly - calendar available on the hydrographic data community website (login required – contact David Anderson, danderson@usgs.gov)</li> <li>• Eleven hydrography trainings on various topics including NHD Basics, NHD Update Tools, NHD GeoConflation, WBD Editor Tools, and NHD HEM.</li> <li>• The Association of State Wetland Managers Wetland Mapping Consortium (WMC) is dedicated to supporting the conservation and management of wetlands through improved wetland mapping and monitoring. The WMC is led by a steering committee which meets regularly to plan activities and actions, including several instructional webinars which are held each year. Additional information, including schedule and webinar recordings may be found at <a href="http://www.aswm.org/wetland-science/wetlands-one-stop-mapping/wetland-mapping-consortium">http://www.aswm.org/wetland-science/wetlands-one-stop-mapping/wetland-mapping-consortium</a>.</li> </ul>			
USGS NGP	3.2.2: Two program staff attended and presented at one conference - the American Water Resources Association Meeting in Orlando, Florida, 13-17			

November 2016 - to disseminate theme-related information.				
<p><b>Objective 3.3:</b> Foster a culture of open-source development and code sharing  <b>Agency and/or Stakeholders Involved:</b> USGS, USFWS, SSWD  <b>Anticipated Outcome:</b> Tools developed to support theme datasets are shared in public open-source repositories and are building a community of users around them, development investments are leveraged across the community</p>				
Actions	Milestones	Performance Indicators	Action Responsibility	Projected Completion Date
3.3.1 Release NHD and WBD toolsets in open source formats	1) NHD and WBD toolset software code released	1) Number of NHD and WBD toolset software code released	USGS	FY19
3.3.2 Encourage others in community to contribute tools and best practices	1) Outreach to community to encourage contributions in meetings, presentations, newsletter, coordinated groups, etc., accomplished	1) Listing of outreach communications	USGS, USFWS, Subcommittee on Spatial Water Data (SSWD)	FY21
3.3.3 Explore the use of challenge grants and other community events like mapathons to engage and expand the field of users and developers	1) Research and inquiries into methods to engage and expand the field of users and developers undertaken	1) Number of research endeavors and/or inquiries undertaken	USGS NGP	FY18
<b>Agency and/or Stakeholder</b>	<b>Activity through FY 2017, Q1</b>			
USGS, SSWD	3.3.2: Outreach communications have been held regularly. The Subcommittee on Spatial Water Data (SSWD), co-chaired by USGS, holds monthly meetings and is encouraging these activities (meeting notes are available at <a href="http://acwi.gov/spatial/minutes/index.html">http://acwi.gov/spatial/minutes/index.html</a> ). Community-supported open-source tool development resources may be found at <a href="https://github.com/ACWI-SSWD">https://github.com/ACWI-SSWD</a> . Information is also communicated through the NHD Newsletter ( <a href="https://nhd.usgs.gov/newsletter_list.html">https://nhd.usgs.gov/newsletter_list.html</a> ) on these topics.			
<p><b>Objective 3.4:</b> Provide a web-based forum and collaborative workspace for the Open Water Data Initiative  <b>Agency and/or Stakeholders Involved:</b> USGS</p>				

<b>Anticipated Outcome:</b> Improved collaboration and coordination within the spatial water data community				
<b>Actions</b>	<b>Milestones</b>	<b>Performance Indicators</b>	<b>Action Responsibility</b>	<b>Projected Completion Date</b>
3.4.1 Establish OWDI wiki and collaborative space within the GeoPlatform Water-Inland Theme Community space	1) OWDI wiki and collaborative space within the GeoPlatform Water-Inland Theme Community space established	1) Wiki and collaborative space within the GeoPlatform Water-Inland Theme Community space operational	USGS	FY18
<b>Agency and/or Stakeholder</b>		<b>Activity through FY 2017, Q1</b>		
<b>Objective 3.5:</b> Continue stakeholder and partner coordination for acquisition of NWI data <b>Agency and/or Stakeholders Involved:</b> USFWS <b>Anticipated Outcome:</b> Integrate wetlands data created by stakeholders and partners into the NWI dataset				
<b>Actions</b> <i>(Describe discrete activities)</i>	<b>Milestones</b> <i>(A significant change in development with associated date)</i>	<b>Performance Indicators</b> <i>(A metric to assess progress of the action)</i>	<b>Action Responsibility</b> <i>(Agency, individuals, and/or groups leading the action)</i>	<b>Projected Completion Date</b> <i>(FY)</i>
3.5.1 Provide updated Wetlands Data Verification tools	1) Updated wetlands data verification tools provided as needed	1) Percentage of new standards, procedures and software versions represented within NWI data verification tools	USFWS NWI, National Standards and Support Team	FY19
3.5.2 Provide wetland mapping training webinars and documentation	1) Wetland mapping training webinars and documentation provided as needed	1) Percentage of new standards and procedures documented	USFWS NWI, National Standards and Support Team and HQ	FY19
3.5.3 Continue outreach activities with the Association of State Wetland Managers (ASWM)	1) ASWM outreach activities continued	1) Number of meetings with ASWM and resultant products	USFWS NWI, National Standards and Support Team and HQ	FY17
<b>Agency and/or Stakeholder</b>		<b>Activity through FY 2017, Q1</b>		

<b>Objective 3.6:</b> Continue steward coordination for acquisition and improvement of NHD and WBD data				
<b>Agency and/or Stakeholders Involved:</b> USGS				
<b>Anticipated Outcome:</b> A well-functioning stewardship process that ensures timely update and improvement of the NHD and WBD datasets				
<b>Actions</b>	<b>Milestones</b>	<b>Performance Indicators</b>	<b>Action Responsibility</b>	<b>Projected Completion Date</b>
3.6.1 Maintain NHD and WBD edit toolsets and steward websites	1) NHD and WBD edit toolsets up-to-date and functioning  2) NHD and WBD stewardship websites accurate and functioning	1) Percentage of NHD and WBD edit toolsets up-to-date and functioning  2) Percentage of NHD and WBD stewardship websites accurate and functioning	USGS NGP	FY21
3.6.2 Provide NHD and WBD tool and edit training	1) NHD and WBD tool and edit training provided quarterly	1) Number of NHD and WBD tool and edit trainings provided	USGS NGP	FY21
3.6.3 Develop web-edit capability to simplify and streamline edit process	1) Web-edit capability developed	1) Percentage of web-edit capability development completed	USGS NGP	FY21
3.6.4 Continue to engage with stewardship partners, and to develop partnership agreements with new partners to the extent possible	1) Stewardship relationships are established and maintained	1) Number of active stewardship relationships	USGS NGP	FY21
<b>Agency and/or Stakeholder</b>	<b>Activity through FY 2017, Q1</b>			
USGS NGP	3.6.1: 100% of NHD and WBD edit toolsets are up-to-date and functioning; 100% of NHD and WBD stewardship websites accurate and functioning ( <a href="http://usgs-mrs.cr.usgs.gov/usgssteward/">http://usgs-mrs.cr.usgs.gov/usgssteward/</a> ).			
USGS NGP	3.6.2: Eleven hydrography trainings were held on various topics including NHD Basics, NHD Update Tools, NHD GeoConflation, WBD Editor Tools, and NHD HEM. Training sessions are regularly held and listed on the			

	Hydrographic Data Community website calendar (login required – contact David Anderson, danderson@usgs.gov).			
<b>Objective 3.7:</b> Engage international partners (Canada and Mexico)				
<b>Agency and/or Stakeholders Involved:</b> USGS				
<b>Anticipated Outcome:</b> Seamless continental hydrography data that support cross-border applications				
<b>Actions</b>	<b>Milestones</b>	<b>Performance Indicators</b>	<b>Action Responsibility</b>	<b>Projected Completion Date</b>
3.7.1 Continue to complete cross-border data harmonization with WBD and NHD	1) NHD and WBD cross-border data harmonization completed	1) Percentage of areas with NHD and WBD cross-border harmonization completed	USGS NGP, USGS OWI	FY21
3.7.2 Evaluate the feasibility of developing an international integrated elevation and hydrography data model that leverages domestic plans and directions outlined in this strategy	1) Meetings to discuss an international elevation and hydrography model held  2) Meeting overview summary produced	1) Listing of meetings held  2) Percentage of meeting overview summary completed	USGS NGP	FY18
3.7.3 Conduct one or more pilot studies developing NHDPlusHR datasets for river basins spanning the U.S.-Canada border	1) US-Canada pilot studies completed	1) Percentage of total planned US-Canada pilot studies completed	USGS NGP	FY18
3.7.4 Initiate discussions with Mexico regarding possible partnership on NHDPlusHR datasets for river basins spanning	1) Discussions with Mexican contacts to discuss potential NHDPlusHR partnerships held	1) Number of discussions held and general outcomes	USGS NGP	FY18

the U.S.-Mexico border				
3.7.5 Conduct one or more pilot studies developing NHDPlusHR datasets for river basins spanning the U.S.-Mexico border	1) US-Mexico pilot studies completed	1) Percentage of total planned US-Mexico pilot studies completed	USGS NGP	FY19
<b>Agency and/or Stakeholder</b>	<b>Activity through FY 2017, Q1</b>			
USGS NGP	3.7.2: Assessing the feasibility of developing an international integrated elevation and hydrography data model is proceeding. Discussions have begun with counterparts in Canada, and a technical meeting will be held 8-10 Feb 2017.			
USGS NGP	3.7.3: Three pilot studies developing NHDPlusHR datasets for river basins spanning the U.S.-Canada border are underway with one prototype dataset completed. More extensive pilots for the other two pilot areas are planned, and data preparation work is in process.			

<b>Goal 4:</b> Provide discoverable, standardized and interoperable data to users				
<b>Objective 4.1:</b> Provide datasets as open and interoperable web services in compliance with agency policies				
<b>Agency and/or Stakeholders Involved:</b> USFWS, USACE, USGS				
<b>Anticipated Outcome:</b> Datasets are openly available and interoperable via web services				
<b>Actions</b>	<b>Milestones</b>	<b>Performance Indicators</b>	<b>Action Responsibility</b>	<b>Projected Completion Date</b>
4.1.1 Continue to leverage current technologies and formats to provide open dataset access via interoperable web services	1) Interoperable web services available	1) Number of interoperable web services available by theme dataset	USFWS, USACE, USGS	FY21
<b>Agency and/or Stakeholder</b>	<b>Activity through FY 2017, Q1</b>			
<b>Objective 4.2:</b> Ensure all datasets in theme have current FGDC compliant metadata in the GeoPlatform and are identified as an NGDA				
<b>Agency and/or Stakeholders Involved:</b> USFWS, USACE, USGS				
<b>Anticipated Outcome:</b> All theme datasets are readily discoverable through the GeoPlatform and clearly identified as NGDAs				

Actions	Milestones	Performance Indicators	Action Responsibility	Projected Completion Date
4.2.1 Ensure all theme datasets have current FGDC compliant metadata including the NGDA theme keyword	1) Current FGDC compliant metadata including the NGDA theme keyword completed for each theme dataset	1) Listing of theme datasets with FGDC compliant metadata including the NGDA theme keyword	USFWS, USACE, USGS	FY21
4.2.2 Ensure all data are distributed with FGDC compliant metadata	1) All theme datasets distributed with FGDC compliant metadata	1) Listing of theme datasets with and without FGDC compliant metadata	USFWS, USACE, USGS	FY21
4.2.3 Publish metadata records on data clearinghouse applications including Data.gov and GeoPlatform.gov	1) All theme dataset metadata records published on Data.gov and GeoPlatform.gov	1) Listing of theme datasets with and without FGDC compliant metadata published on Data.gov and GeoPlatform.gov	USFWS, USACE, USGS	FY21
<b>Agency and/or Stakeholder</b>		<b>Activity through FY 2017, Q1</b>		
USGS, USFWS		<p>4.2.1: Theme datasets with current FGDC compliant metadata including the NGDA theme keyword include:</p> <ul style="list-style-type: none"> <li>• National Hydrography Dataset: <a href="https://cms.geoplatform.gov/node/243/e6482162-4491-482b-b9dd-adb0b0a1141f">https://cms.geoplatform.gov/node/243/e6482162-4491-482b-b9dd-adb0b0a1141f</a> (also available through The National Map with FGDC compliant metadata)</li> <li>• Watershed Boundary Dataset: <a href="https://cms.geoplatform.gov/node/243/4fce9f0d-3355-42c3-ab0a-a9d76f674927">https://cms.geoplatform.gov/node/243/4fce9f0d-3355-42c3-ab0a-a9d76f674927</a> (also available through The National Map with FGDC compliant metadata)</li> <li>• National Wetlands Inventory: <a href="https://www.fws.gov/wetlands/Data/Metadata.html">https://www.fws.gov/wetlands/Data/Metadata.html</a></li> </ul>		

USGS, USFWS	<p>4.2.2: Theme datasets distributed with current FGDC compliant metadata including the NGDA theme keyword include:</p> <ul style="list-style-type: none"> <li>• National Hydrography Dataset: <a href="https://cms.geoplatform.gov/node/243/e6482162-4491-482b-b9dd-adb0b0a1141f">https://cms.geoplatform.gov/node/243/e6482162-4491-482b-b9dd-adb0b0a1141f</a> (also available through The National Map with FGDC compliant metadata)</li> <li>• Watershed Boundary Dataset: <a href="https://cms.geoplatform.gov/node/243/4fce9f0d-3355-42c3-ab0a-a9d76f674927">https://cms.geoplatform.gov/node/243/4fce9f0d-3355-42c3-ab0a-a9d76f674927</a> (also available through The National Map with FGDC compliant metadata)</li> <li>• National Wetlands Inventory: <a href="https://www.fws.gov/wetlands/Data/Metadata.html">https://www.fws.gov/wetlands/Data/Metadata.html</a></li> </ul>			
USGS	<p>4.2.3: Theme datasets with metadata records published on data clearinghouse applications including Data.gov and GeoPlatform.gov include:</p> <ul style="list-style-type: none"> <li>• National Hydrography Dataset: <a href="https://cms.geoplatform.gov/node/243/e6482162-4491-482b-b9dd-adb0b0a1141f">https://cms.geoplatform.gov/node/243/e6482162-4491-482b-b9dd-adb0b0a1141f</a> (also available through The National Map with FGDC compliant metadata)</li> <li>• Watershed Boundary Dataset: <a href="https://cms.geoplatform.gov/node/243/4fce9f0d-3355-42c3-ab0a-a9d76f674927">https://cms.geoplatform.gov/node/243/4fce9f0d-3355-42c3-ab0a-a9d76f674927</a> (also available through The National Map with FGDC compliant metadata)</li> </ul>			
<p><b>Objective 4.3:</b> Maintain and update existing standards as needed to reflect best practices  <b>Agency and/or Stakeholders Involved:</b> USGS  <b>Anticipated Outcome:</b> Well documented and easily accessible standards allow both dataset managers and user community to understand and implement best practices for using and maintaining data</p>				
<b>Actions</b>	<b>Milestones</b>	<b>Performance Indicators</b>	<b>Action Responsibility</b>	<b>Projected Completion Date</b>
4.3.1 Update WBD standards ( <a href="http://pubs.usgs.gov/tm/11/a3/">http://pubs.usgs.gov/tm/11/a3/</a> , 4th edition) in FY2018 to meet current best practice guidelines.	1) WBD standards updated	1) Percentage of total WBD standards updated	USGS NGP, USGS OWI	FY18
4.3.2 Revise NHD and WBD standards to reflect updated	1) Review of NHD and WBD standards	1) Number of NHD and WBD	USGS NGP, USGS OWI	FY21

delineation practices developed during research into NHDPlus catchment integration and automated delineation efforts (Objective 2.3)	to determine which need alignment with Obj 2.3 outcomes  2) NHD and WBD standards revised in alignment with Obj 2.3 outcomes	standards needing revision due to Obj 2.3 outcomes  2) Percentage NHD and WBD standards revised due to Obj 2.3 outcomes completed		
4.3.3 Investigate use of Specifications Explorer as a standards delivery mechanism for NHD and WBD.	1) Investigate alternative standards delivery mechanisms as necessary	1) Percentage of necessary investigation completed	USGS NGP	FY21
<b>Agency and/or Stakeholder</b>		<b>Activity through FY 2017, Q1</b>		
<b>Objective 4.4:</b> Improve accessibility of dams and levee information <b>Agency and/or Stakeholders Involved:</b> USACE <b>Anticipated Outcome:</b> Dams and levee information are more discoverable and accessible to users				
<b>Actions</b>	<b>Milestones</b>	<b>Performance Indicators</b>	<b>Action Responsibility</b>	<b>Projected Completion Date</b>
4.4.1 Start annual publication of the National Inventory of Dams in early 2017 with updated dam information from states	1) Publication of National Inventory of Dams in 2017  2) Publication of National Inventory of Dams in 2019  3) Publication of National Inventory of Dams in 2021	1) Publication Complete  1) Publication Complete  1) Publication Complete	USACE	FY21
4.4.2 Improve publish mapping and data access capabilities for the National Levee Database in early 2017	1) Publish mapping and data access capabilities for the National Levee Database improved in 2017	1) Publication Complete	USACE	FY17
4.4.3 Start publication of the National Levee Database with	1) Publication of National Levee	1) Publication Complete	USACE	FY21

updated levee information from states and other federal agencies in mid-2017	Database in 2019 2) Publication of National Levee Database in 2021	1) Publication Complete		
<b>Agency and/or Stakeholder</b>		<b>Activity through FY 2017, Q1</b>		
<b>Objective 4.5:</b> Develop toolsets and web services to deliver drainage area boundaries for gages stored in the USGS National Water Information System (NWIS) <b>Agency and/or Stakeholders Involved:</b> USGS <b>Anticipated Outcome:</b> Improved accessibility of gaged drainage areas				
<b>Actions</b>	<b>Milestones</b>	<b>Performance Indicators</b>	<b>Action Responsibility</b>	<b>Projected Completion Date</b>
4.5.1 Leverage current technologies to develop open dataset access via web services	1) Public dataset access via web services developed	1) Total number of web services available	USGS NGP, USGS OWI	FY18
<b>Agency and/or Stakeholder</b>		<b>Activity through FY 2017, Q1</b>		
<b>Objective 4.6:</b> Provide network-based data discovery and analysis framework <b>Agency and/or Stakeholders Involved:</b> USGS <b>Anticipated Outcome:</b> Data linked to the hydrography framework can be easily discovered and shared for multiple uses				
<b>Actions</b>	<b>Milestones</b>	<b>Performance Indicators</b>	<b>Action Responsibility</b>	<b>Projected Completion Date</b>
4.6.1 Continue development of a network-linked data index	1) Network-linked data index development	1) Listing of network-linked data index improvements	USGS NGP, USGS OWI	FY19
4.6.2 Develop network-linked data index services based on NHDPlusHR	1) NHDPlusHR network-linked data index service(s) development	1) Percentage completion of NHDPlusHR network-linked data index service(s) developed	USGS NGP	FY19
4.6.3 Promote listing of datasets in network-linked data index	1) Outreach to promote network-linked data index listings	1) Total number of outreach communications	USGS NGP, USGS OWI	FY21
<b>Agency and/or Stakeholder</b>		<b>Activity through FY 2017, Q1</b>		
USGS NGP		4.6.1: Collaborative development of a network-linked data index is ongoing and managed through the open-source repository at		

	<p><a href="https://github.com/ACWI-SSWD">https://github.com/ACWI-SSWD</a>. An initial prototype is implemented and active within the Water Quality Portal (<a href="http://www.waterqualitydata.us/">http://www.waterqualitydata.us/</a>). Enhancements to the basic functionality are ongoing and planned.</p>
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