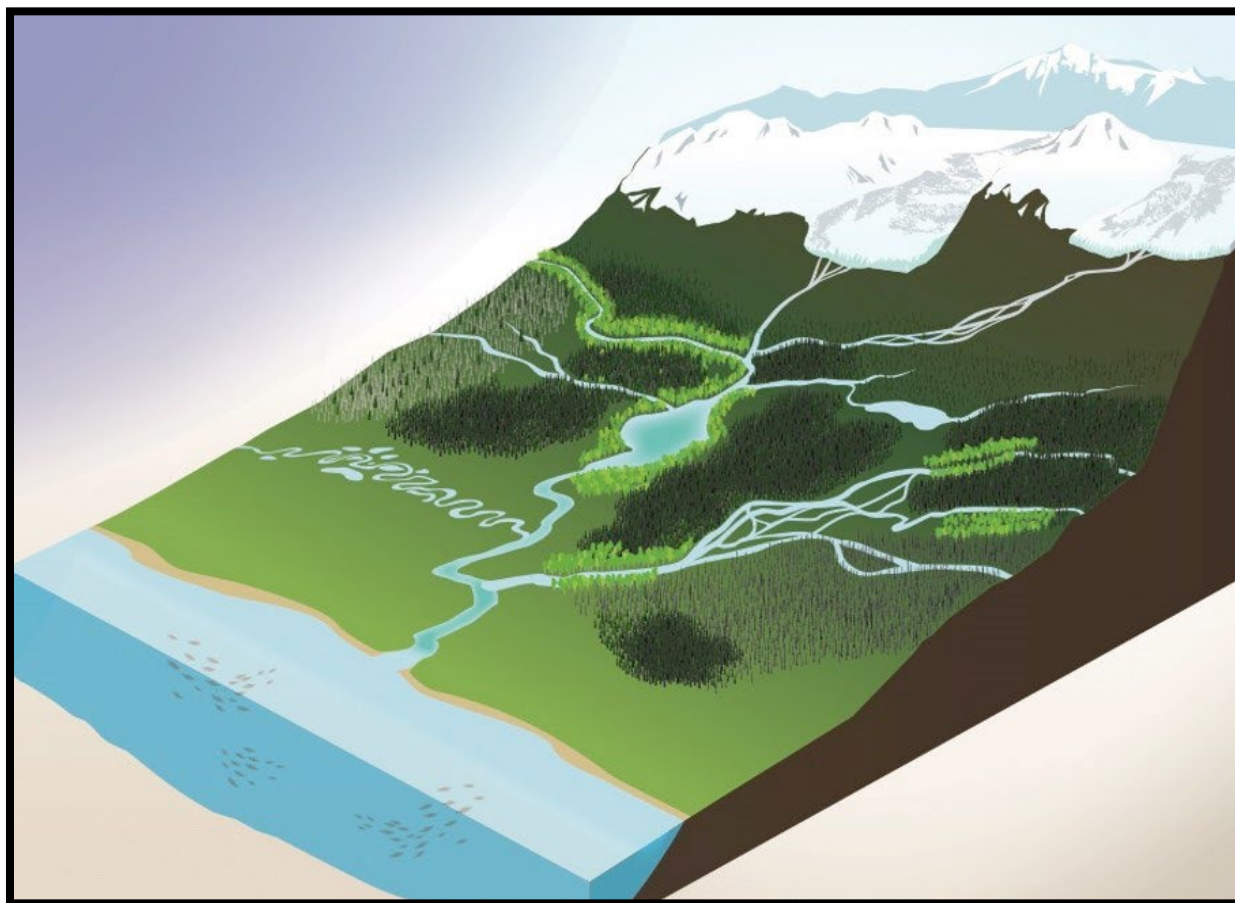


STANDARDIZED, HIGH-RESOLUTION, GEOSPATIAL WETLANDS AND HYDROGRAPHY DATA ACROSS THE EVOS REGION



Adapted from Schoen et al. 2017 Fisheries 42: 538-553. Support from Alaska EPSCoR NSF award #OIA-1208927 and the state of Alaska.



EVOSTC HABITAT RESTORATION or ENHANCEMENT PROJECT PROPOSAL FORM

Does this proposal contain confidential information? Yes No

Project Number* and Title

Standardized, High-Resolution, Geospatial Wetlands and Hydrography Data Across the EVOS Region

Primary Proposer(s) and Affiliation(s)

Sydney Thielke, Regional Wetlands Coordinator, U.S. Fish and Wildlife Service (USFWS)

Dr. Leslie Jones, Geospatial Information Officer, Alaska Department of Natural Resources (AK DNR)

Brian Wright, National Map Liaison, U.S. Geological Survey (USGS)

Date Proposal Submitted

October 1, 2020

Project Abstract

This project develops a comprehensive and ecosystem-based hydrologic framework across the EVOS region. The project deliverables include contemporary National Wetlands Inventory (NWI) and National Hydrography Dataset (NHD) information for use in assessing and monitoring injured resources and services throughout the project area. The final product will be a seamless integration of NWI and NHD datasets, compliant with national standards, into the national geodatabases.

Continuous coverage of high-resolution NWI and NHD products do not exist for the EVOS region and are critically important for continued management and recovery of injured resources and services. This proposal requests \$3.87 million dollars to complete high-resolution, publicly available mapping of hydrography, wetlands, and nearshore habitats, consisting of a total of 31million acres (Figures 1 and 2).

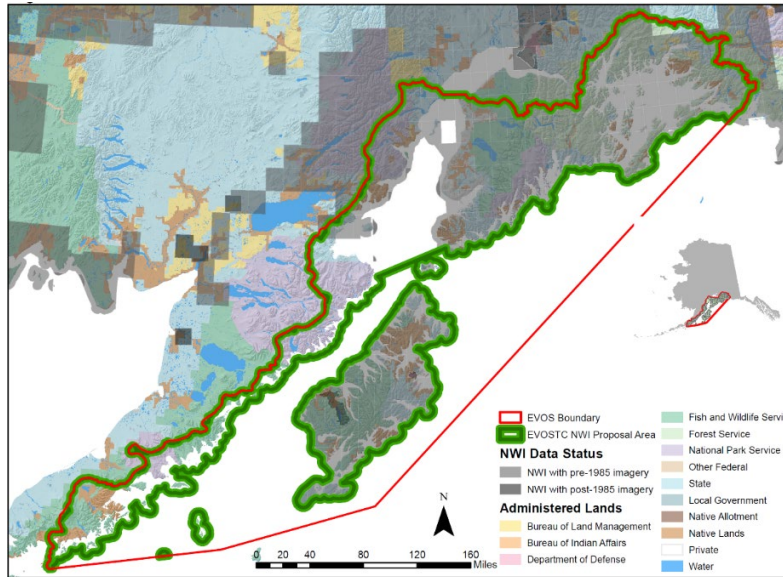


Figure 1 National Wetlands Inventory (NWI) project area

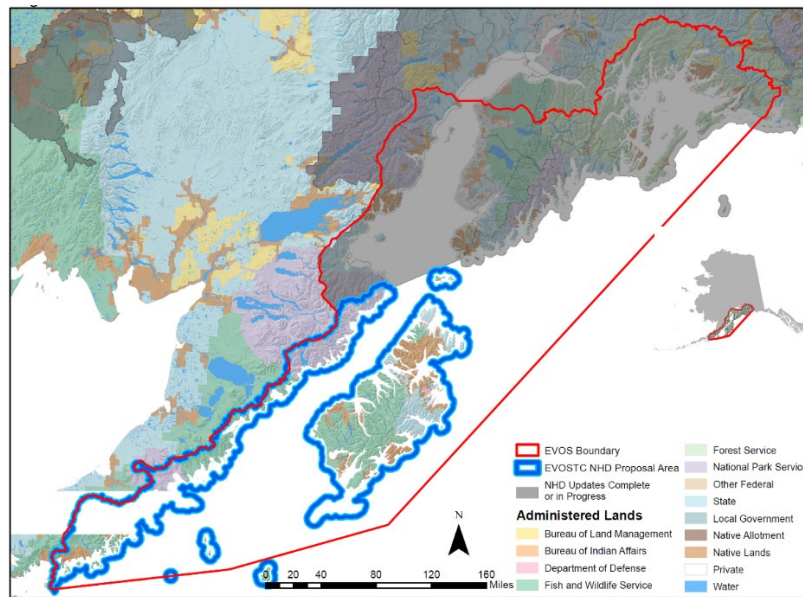


Figure 2 National Hydrography Dataset (NHD) project area

Accurately representing the connectivity of wetland, terrestrial hydrography, estuarine and nearshore habitats allows for an ecosystem approach to managing injured resources and services. The NWI and NHD inform mission critical activities undertaken by government entities (Federal, state, regional, county, local, Tribal), nonprofit organizations, and private companies. Examples of activities informed by NWI and NHD that effect injured resources and services include:

- Manage water such as stream flow and stormwater
- Monitor water quality
- Model and map flood risk
- Conserve terrestrial and aquatic habitats
- Manage fisheries, rangeland, timberlands, and agricultural lands

- Assess coastal hazards
- Plan for future land development activities and infrastructure
- Provide recreational opportunities for citizens

The NWI represents the location, characteristics and extent of wetlands, intertidal, and nearshore marine habitats (Figure 3). The NWI also captures intertidal and nearshore subtidal habitat information such as coastline substrate and the presence of nearshore aquatic vegetation. The NHD dataset documents the location of terrestrial surface waters (i.e., stream, rivers, lakes), their flow paths, and watershed boundaries. Both datasets can be integrated with the previously funded ShoreZone Mapping project to better understand habitats supporting populations of injured resources and aid as a decision-support tool in project planning.

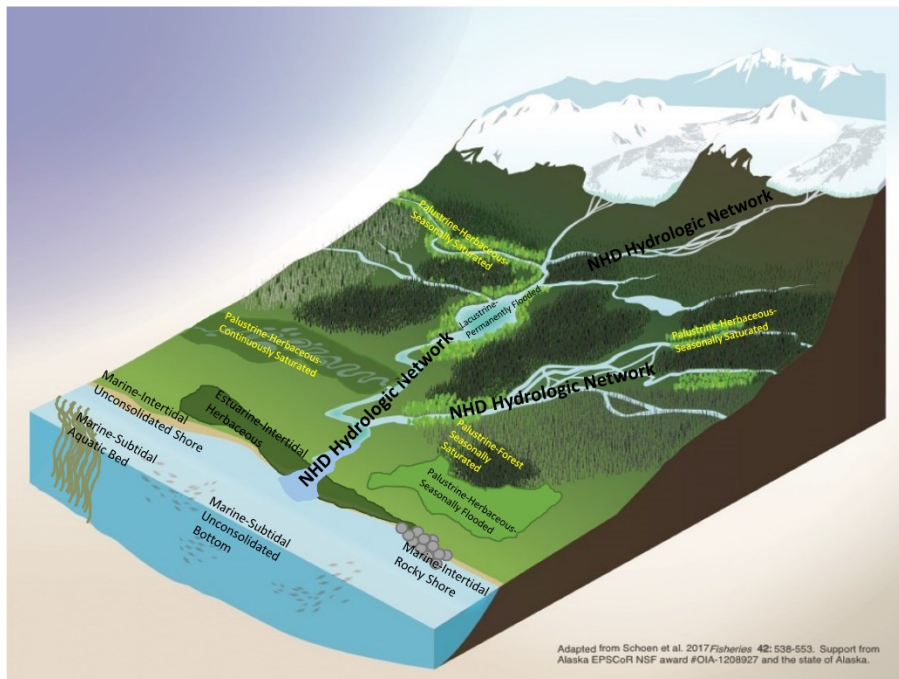


Figure 3 Example characterization of landscape connectivity of wetlands and hydrography

The NWI and NHD are used in Alaska for habitat management, species assessments (including anadromous waters), (Flagstad et. Al 2018, Fellman et. Al 2014, Shanley and Albert 2014), and to inform development activities throughout Alaska (USACE 2015, ADOT&PF 2010). The data serve as the baseline geospatial information needed to monitor aquatic and wetland dependent species, including species such as salmon that move between freshwater, nearshore, and marine habitats. This includes providing information about sensitive estuaries, coastal wetlands and the contribution of freshwater inputs to estuarine and nearshore habitats (i.e., water quality and chemistry). This proposal will provide framework geospatial data (FGDC, 2014) that can be used to assess intertidal systems that support not only habitat for injured resources but also subsistence and recreation activities and services.

Data development will be conducted over a three-year timeframe. Geospatial datasets will be developed and assembled according to national mapping and classification standards and reviewed according to national mapping quality assurance quality control protocols. The NWI and NHD production process will be contracted with experienced professionals that use image interpretation, machine

learning and field data collection to create standardized wetland and hydrography products. The primary fiscal agent will be USFWS and the project will be managed by Sydney Thielke (USFWS) with close coordination and assistance provided by Leslie Jones (State of Alaska) and Brian Wright (USGS). Major land managers and owners in the EVOS region have been included in the initial project scoping of this project and coordination will be ongoing.

In the past decade, the Alaska Geospatial Council (AGC) chaired by the Commissioner of AK DNR has represented state mapping interests and the Alaska Mapping Executive Committee (AMEC) chaired by Directors of USGS and NOAA representing federal interests have advocated for consistent baseline geospatial datasets for Alaska. Through active collaboration and coordination, the AGC and AMEC have acquired digital elevation and imagery products for the entire state. Wetlands and hydrography updates, however, still lack funding and coordination, which means that most of Alaska remains unmapped and/or products are extremely out-of-date. If funded, the area within the EVOS boundary will have the most up-to-date high-resolution NWI and NHD that meet national standards of the USFWS and USGS.

EVOSTC Funding Requested* (must include 9% GA)

| | FY21 | FY22 | FY23 | TOTAL |
|----------------------|------------------|------|------|------------------|
| Total Request | 3,871,959 | | | 3,871,959 |

Non-EVOSTC Funds to be used, please include source and amount per source:

| | FY21 | FY22 | FY23 | TOTAL |
|--------------------------------|--------|--------|--------|---------|
| In-Kind Total | 55,646 | 78,091 | 78,091 | 211,828 |
| <i>USFWS In-Kind</i> | 22,445 | 44,891 | 44,891 | 112,227 |
| <i>USGS In-Kind</i> | 23,806 | 23,806 | 23,806 | 71,418 |
| <i>State of Alaska In-Kind</i> | 9,395 | 9,395 | 9,395 | 28,185 |

**If the amount requested here does not match the amount on the budget form, the request on the budget form will be considered to be correct.*

USFWS project management, coordination, QC

USGS Alaska Mapping Executive Committee and National Map coordination

State of AK project management and AGC coordination

1. PROJECT EXECUTIVE SUMMARY

The proposed project will encompass the entire EVOS region. The project will fill gaps in missing and provide updates to outdated NWI and NHD data for 31.5 million acres. This geospatial information is needed to implement actions to address injured species and services including, habitat restoration projects, monitoring ecological and species trends and improving response to future spills, including natural resource damage assessments. Figures 1 and 2 delineate the inventory areas for the NWI and NHD respectively.

In order for the NHD and NWI datasets to be used to support recovery on injured species and services, they must be of consistent scale, comprehensive to the region and accurate. The NHD for Kodiak Island and the Alaska Peninsula was created using the 1:63,360 maps produced in 1950-60's via stereo imagery and are not appropriate for use in digital GIS systems. Errors in geography, flow paths and direction of water flow are inherent issues with the legacy dataset. The NWI currently consists of information primarily produced using analog methods and photography from the 1970s. This project will complete contemporary and consistent data that will be used to further recovery efforts of injured resources and services.

There have been data collection projects for intertidal communities of the EVOS region over the past twenty-five years, including the ShoreZone and Cook Inlet Salt Marsh projects. However, these products do not meet National Spatial Data Infrastructure (NSDI) requirements and do not provide complete coverage across the entire region. We will incorporate existing intertidal information from past projects, wherever possible, into the NWI and NHD proposed products. The incorporation and cross reference of existing data will be leveraged to create a comprehensive inventory of intertidal and nearshore habitat data within the EVOS area. Contemporary mapping of wetland and surface waters from headwaters to the ocean will allow managers to better understand inputs, outputs, and overall hydrologic connectivity through the entire region (Walker et al 2012). This includes water quality and chemistry in the nearshore environments resulting from freshwater hydrologic inputs (Hoem et al 2014). A better understanding of water chemistry and quality in these areas can assist with monitoring of harmful algal blooms, which are contributing to shellfish poisoning to humans and marine mammals in coastal regions of Alaska (Vandersea et al, 2018). Additionally, estuarine conditions have been linked to the distribution of kelp forests in the Kachemak Bay region, which support tightly linked trophic interactions between primary producers, herbivores, and carnivores (Schoch and Chenelot 2004).

When NHD, NWI and ShoreZone are integrated together they will provide a comprehensive picture of the current coastal watershed habitats used by aquatic and wetland reliant species. For example, the NWI classifies estuarine habitats by different characteristics that certain species prefer; this means distinguishing estuarine-intertidal-herbaceous habitat from estuarine-intertidal-shrub habitat. These specific attributes are commonly used to delineate abundance and distribution of habitat types, which are then used to inform species distributions (i.e., sea otters; Doroff et al 2012). Understanding how species and communities are using a diverse range of habitats allows for more informed management of resources and land use activities. The recovering resources and services that will most directly benefit from this project will be intertidal communities, avian communities that utilize both inland wetlands, freshwater and nearshore environments, and aquatic species that migrate between freshwater, estuarine, and marine habitats. Alaska is rich in natural resources, all of which provide economic and resource support for recreation, tourism and subsistence activities.

2. PROJECT HISTORY

The National Wetlands Inventory and National Hydrography Dataset are stewarded by the USFWS and USGS respectively. These data are used to support land management, development and habitat inquiries across the country. However, in Alaska funding has not been consistently allocated to consider them regular agency activities. The creation of NWI and NHD data has been completed solely through partnerships and fundraising with government and non-government entities on an opportunistic basis.

The NWI program originated in 1986, however only 42% of Alaska has data available and original products over much of the EVOS zone were produced using analog methods and imagery from the 1970s and 1980s. This has led to registration issues and misrepresentation of features in the database (Figures 4 and 5). The original NHD products produced for Alaska were generated at such a gross scale that rivers on the map have been found to be inaccurate by substantial amounts and even misrepresented entirely; Alaska was never completed at a 1:24,000 mapping scale which is the most current standards for mapping NHD and consistent with the contiguous US. The State has been updating and improving the hydrography through the development of individual collaborative partnerships having common geographic areas of interest. Although there has been increased attention to the lack of foundational geospatial datasets in Alaska, there is still a lack of funding and planning for completing either of these framework data themes that make up the hydrologic system.

Investments and completion of statewide high-resolution elevation and imagery data now provide the opportunity to efficiently move forward with the production of geospatial data such as NWI and NHD. It is important for data creation based on elevation and imagery such as NWI and NHD to be timely in order to ensure data represents the most current of landscape conditions; the location of both wetlands and linear hydrologic features can be dynamic. There are current NHD projects occurring within areas of the EVOS zone but the Shelikof Strait and Kodiak Island watersheds do not have funding for NHD creation. There is a limited extent of NWI data within the EVOS zone and where it does exist, it was produced using photographs that are in some cases over 40 years old and there have been many documented changes in wetland distribution since that time (figures 4 and 5).

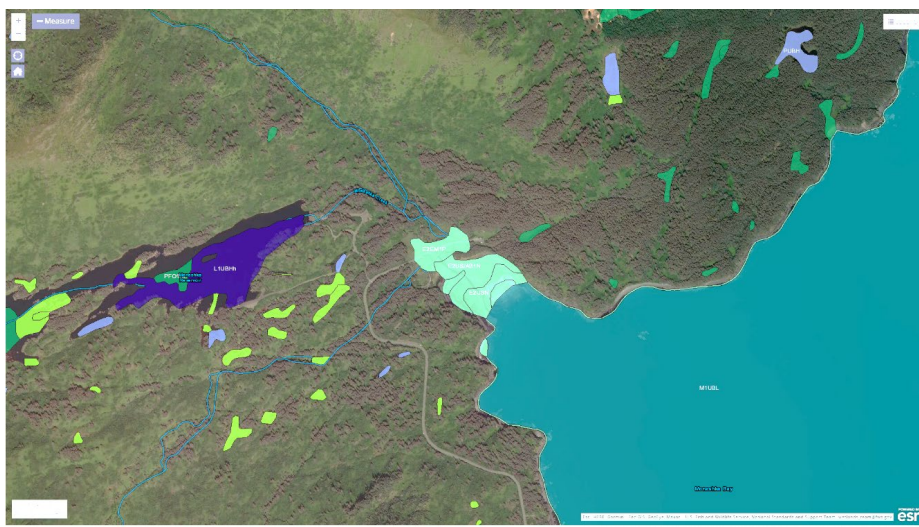


Figure 4 NWI inaccuracies and hydrologic misrepresentation in the Monashka Bay area of Kodiak Island.



Figure 5 Land use changes are apparent between the creation of the NWI and current status near Seward, AK.

3. PROJECT DESIGN

A. Objectives

The objective of this project is to create a comprehensive and contemporary hydrologic depiction for the spill region that can be used for injured species and service recovery. The project builds on existing NHD projects in the Prince William Sound and Cook Inlet Regions and technological advances in both NWI and NHD development over the past decade.

This project supports an ecosystem approach for recovery of injured resources. It will expand the coverage of NWI and NHD datasets and will result in higher resolution data than has been previously produced for most of Alaska. Research and land management can be coordinated upstream and downstream in order to understand the entire ecosystem and support recovery efforts. The production of these publicly available datasets will provide information on hydrologic connectivity of surface water and wetlands from the ocean to the headwater streams. The high-resolution products will provide tools to enhance planning, restoration, monitoring and project reconnaissance decisions in intertidal zones, fish bearing streams, nearshore marine environments, recreation and tourism.

B. Procedural and Scientific Methods

The FWS National Wetlands Inventory (NWI) and USGS National Hydrography Dataset (NHD) are publicly available resources that provide detailed information on the abundance, characteristics, and distribution of wetlands and hydrographic features on the landscape. NWI and NHD data are used to understand and manage hydrologic systems and their dependent resources. This project consists of development of high-resolution (one-acre target mapping unit) National Wetlands Inventory and high-resolution National Hydrography Datasets produced at a 1:24,000 mapping scale. The deliverable products include geodatabases that meet all required standards and specifications for each dataset.

In the Prince William Sound and Cook Inlet, the NHD has already been produced, or is in production, to meet current USGS specifications. Therefore, this project targets completion of the NHD in the Shelikof

Strait and Kodiak Island watersheds. In those watersheds, the NHD and NWI products will be produced concurrently to streamline the data production workflow. NWI production will not include NHD in the remainder of the project because of recent updates. However, recent updates to the NHD in those regions will be integrated into the NWI production workflow.

The NWI and NHD datasets have nationally established standard and protocols for data development. The Federal Geographic Data Committee oversees the general standards (FGDC 2008, 2009, 2013) and the individual agencies, USFWS and USGS, have develop the specifications and data development procedures (USGS 2020, Dahl et. Al 2015). Contractors will be required to deliver NWI data according to those described in: Classification of Wetlands and Deepwater Habitats of the U.S. (Cowardin et al., 1979, revised 2013); Federal Wetlands Mapping Standard (2009). For hydrography, contractors will be required to deliver NHD data according to those described in the Elevation-Derived Hydrography Acquisition Specifications Chapter 11 of Section B, U.S. Geological Survey Standards, of Book 11, Collection and Delineation of Spatial Data.

Data development will be conducted over a three-year timeframe. This funding opportunity supports developing contract(s) to produce customized, spatially explicit datasets that identify wetland and hydrographic features and establish their connectivity within a watershed context. Geospatial datasets will be developed and assembled according to national mapping and classification standards and reviewed according to national mapping quality assurance and quality control protocols. Spatially explicit datasets will focus on characterizing river and stream channels, open waterbodies, and wetland features consistent in detail to that established for feature delineation at the one-acre target mapping unit for the project area. For the NWI, an inclusion of characterizing wetlands that meet organic soil modifiers will be made.

In order to ensure consistency with national standards and protocols the NWI and NHD production process will be supported by field data collection and validation. Georeferenced photographs and field data collection forms will be used for field sites to document observed dominant or unique vegetation, soil information and supporting classification information. All field data will be delivered to the State of Alaska including geospatial and tabular information to support future management and decisions related to species recovery.

A final report will be completed that summarizes field procedures, outputs and classification for each watershed. Each wetland classification code will be supplemented with photographic examples and general vegetation characteristics including dominant or unique species.

The contractor(s) will identify and map wetlands and hydrography using current digital imagery and ancillary datasets provided or identified by the project managers in an ESRI ArcGIS desktop environment at a data resolution of a one-acre target map unit or 1:24,000 scale. The contractor(s) will follow the standards and documents mentioned above and use the custom QA/QC tools and processes provided by the USFWS and USGS. The recipient will conduct 100% internal Quality Control of all data and field verification of a reasonable number of the field sites, in consultation with project manager, to ensure accurate and consistent imagery interpretation and elevation derivation.

The mapping supported by this funding opportunity requires a unique approach to fully integrate the interpretation of hydrographic and wetland feature types utilizing the best available imagery and elevation sources, integrated mapping protocols and hydrologic modeling tools to characterize all

wetland and hydrographic features for representation on 1:24,000 maps. The project will require extensive cooperative discussions to fully develop and refine the mapping and classification protocols. All spatial data produced under this funding opportunity will be developed in compliance with Federal Geographic Data, USGS and FWS standards and protocols.

There are several contractors with experience producing NWI and NHD in Alaska. This project will be fulfilled through a competitive bid process.

C. Description of Project Area

The study area will encompass the entire EVOS region. The project will fill gaps in geospatial information on a total of 31.5 million acres. The project area includes all or parts of eleven eight-digit watersheds. Table one provides the watershed name, Hydrologic Unit Code and amount of land of each watershed that falls within the evaluation area (Table 1).

Table 1. Watershed labels and size

| Watershed Name | HUC8 | Terrestrial and Nearshore Acres | Terrestrial and Nearshore Square Miles |
|---|-------------|--|---|
| Lower Copper River | 19020104 | 422,908 | 661 |
| Lower Kenai Peninsula | 19020301 | 1,769,572 | 2,765 |
| Tuxedni-Kamishak Bays | 19020602 | 1,923,306 | 3,005 |
| Prince William Sound | 19020203 | 609,940 | 953 |
| Upper Kenai Peninsula | 19020302 | 1,429,262 | 2,233 |
| Eastern Prince William Sound | 19020201 | 2,992,385 | 4,676 |
| Redoubt-Trading Bays | 19020601 | 500,959 | 783 |
| Cook Inlet | 19020800 | 42,959 | 67 |
| Kodiak-Afognak Islands | 19020701 | 3,388,460 | 5,294 |
| Resurrection River-Frontal Resurrection Bay | 19020202 | 1,270,340 | 1,985 |
| Shelikof Strait | 19020702 | 2,863,238 | 4,474 |

4. MANGEMENT AND PERSONNEL

A. Management

The primary fiscal agent for this project is the USFWS. The lead Project Manager is Sydney Thielke, USFWS, with close coordination and assistance provided by Leslie Jones, State of Alaska and Brian Wright, USGS. Data creation contractor(s) will be determined through a competitive bid selection process.

The land management and ownership patterns throughout the EVOS region are complex. Initial project scoping has already included Bureau of Land Management, National Park Service, U.S. Forest Service, State of Alaska DNR, Chugach Corporation, Chugach Regional Resources Commission, and National

Wildlife Refuges. There are no known objections to this project and letters of support from land managers, owners and interested parties are included in this funding request.

Once funded and a contractor has been selected, the project managers and contractor(s) will work closely with all landowners to identify acceptable field sites for data collection. Only field locations with permission of the landowners will be visited to validate image interpretations.

B. Personnel Qualifications

Curriculum Vitae attached for the following:

Sydney Thielke
Regional Wetlands Coordinator
U.S. Fish and Wildlife Service
Anchorage, AK
Sydney_thielke@fws.gov
(907)229-6308

Brian Wright
Alaska National Map Liaison
National Geospatial Program
U.S. Geological Survey
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Dr. Leslie Jones
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(907) 269-5710

5. DELIVERABLES

This project will have tangible deliverables that will be available for use by land managers, researchers and interested parties.

- 1. Create high-resolution NWI geodatabase for the entire EVOS Region**
- 2. Create NHD Plus High-resolution data for the Shelikof Strait and Kodiak watersheds**
- 3. Produce professional reports detailing process steps and geodatabase attributes**
- 4. Produce geospatial and tabular data packages for field data**
- 5. Conduct outreach to educate stakeholders regarding integration of NWI and NHD products into their workflows**

National Wetlands Inventory and National Hydrography Database products will be incorporated to the National Spatial Data Infrastructure along with their corresponding metadata. Professional reports and ancillary field data packages will be provided to the State of Alaska for inclusion in the framework and data distribution through the Alaska Geospatial Council.

6. PROJECT STATUS OF SCHEDULED ACCOMPLISHMENTS

| Milestone/Task | FY21 | | | | FY22 | | | | FY23 | | | |
|----------------------------------|------|---|---|---|------|---|---|---|------|---|---|---|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Milestone-Contracting | | | | | | | | | | | | |
| Announce contract(s) | x | | | | | | | | | | | |
| Award contract(s) | | x | | | | | | | | | | |
| Milestone-Premapping | | | | | | | | | | | | |
| Data gathering | | | x | | | | | | | | | |
| Desktop Data Creation | | | | x | | | | | | | | |
| Milestone-Field work | | | | | | | | | | | | |
| Site Identification | | | | | x | | | | | | | |
| Data Collection | | | | | | | | x | | | | |
| Data Synthesis | | | | | | | | x | | | | |
| Milestone-Data Production | | | | | | | | | | | | |
| Geodatabase population | | | | | | | | | | x | | |
| QA/QC | | | | | | | | | | | x | |
| Reporting | | | | | | | | | | | | |
| Interim (quarterly) reports | x | x | x | x | x | x | x | x | x | x | x | x |
| FY work plan | x | | | | x | | | | x | | | |
| Final Project report | | | | | | | | | | | | x |
| Deliverables | | | | | | | | | | | | |
| Field Data package | | | | | | | | | | | | x |
| Final attribute report | | | | | | | | | | | | x |
| NHD gdb | | | | | | | | | | | | x |
| NWI gdb | | | | | | | | | | | | x |
| Project Outreach | | | | x | | | | x | | | | x |

7. BUDGET

The USFWS will be the primary fiscal agent. USFWS will award data production contracts through a competitive bid process, with individual contracts being no smaller than an eight-digit watershed basis. The USFWS will also enter into a cooperative agreement with the State of Alaska, through the DNR and the Alaska Geospatial Council (AGC), to assist with managing the National Hydrography Dataset project coordination and quality control. The AGC, administered by DNR, will house and serve the geospatial and field data collected and delivered for this project, as well as final reports. Additionally, the state will work with contractor(s) to conduct outreach related to field activities and data use.

The budget for this project is reasonable and justified. The project team has considerable experience developing cost estimates for geospatial data collection and managing contracts and agreements for NWI and NHD mapping projects. Ms. Thielke is currently overseeing NWI projects covering over 70 million acres in Alaska. Dr. Jones was the Program Aquatic Ecologist at the University of Alaska, Alaska Center for Conservation Science for 3 years where she served as the Primary Investigator for 4 National Hydrography Dataset projects totaling \$560,000. Mr. Wright coordinates numerous agreements among federal partners with Alaska Mapping and Modernization funding to update hydrography; he has financial assistance, project management and technical expertise.

A. Budget Summary Table

| Budget Category | | FY21 | FY22 | FY23 | Total Proposed |
|---|-------------------------------------|------------------|------|------|------------------|
| <i>Personnel</i> | | | | | |
| <i>Travel</i> | | | | | |
| Competitive data production contract | | 3,152,256 | | | 3,152,256 |
| | <i>Shelikof Concurrent NWI/NHD</i> | 740,863 | | | |
| | <i>Kodiak Concurrent NWI/NHD</i> | 876,764 | | | |
| | <i>Lower Cooper River NWI</i> | 59,207 | | | |
| | <i>Lower Kenai Peninsula NWI</i> | 247,740 | | | |
| | <i>Tuxedni-Kamishak Bays</i> | 269,263 | | | |
| | <i>Prince William Sound</i> | 85,392 | | | |
| | <i>Upper Kenai Peninsula</i> | 200,097 | | | |
| | <i>Eastern Prince William Sound</i> | 418,934 | | | |
| | <i>Redoubt-Trading Bays</i> | 70,134 | | | |
| | <i>Cook Inlet</i> | 6,014 | | | |
| | <i>Resurrection River</i> | 177,848 | | | |
| | | | | | |

| | | | | |
|---|------------------|--------|--------|------------------|
| State of Alaska contract <i>NHD project management, data review and public data hosting</i> | 400,000 | | | 400,000 |
| | | | | |
| Commodities | | | | |
| Subtotal | 3,552,256 | | | 3,552,256 |
| <i>GA (9% of subtotal)</i> | 319,703 | | | 319,703 |
| Project Total | 3,871,959 | | | 3,871,959 |
| | | | | |
| <i>USFWS In-Kind</i> | 22,445 | 44,891 | 44,891 | 112,227 |
| <i>USGS In-Kind</i> | 23,806 | 23,806 | 23,806 | 71,419 |
| <i>State of Alaska In-Kind</i> | 9,395 | 9,395 | 9,395 | 28,185 |

B. Sources of Additional Funding

The USFWS will contribute to this project through in-kind contributions related to contract oversight, project coordination and conducting Quality Assurance and Quality Control (QA/QC). Project coordination includes contract administration and field work activities. Quality Assurance and Quality Control will be performed by regional and national staff.

The USGS will contribute to this project through in-kind contributions related to contract language, project outreach and coordination, and data review under the National Geospatial Program and oversight of the Alaska Mapping Executive Committee. The National Map Liaison will work closely with the USFWS to ensure the most recent NHD specifications are included in all contracting materials. They will also keep the AMEC and NGP program up to date on status of mapping activities.

The State of Alaska will contribute to this project through in-kind contributions related to the Geospatial Information Officer’s leadership and coordination for the Alaska Geospatial Council, Hydrography and Wetland Technical Working Groups.

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U.S. Geological Survey and U.S. Department of Agriculture, Natural Resources Conservation Service, 2009, Federal guidelines, requirements, and procedures for the national Watershed Boundary Dataset: U.S. Geological Survey Techniques and Methods 11–A3, 55 p.

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9. Project Support

Attached Letters of Support:

- State of Alaska, Department of Natural Resources
- Alaska Department of Environmental Conservation, Storm Water and Wetlands
- Chugach Regional Resources Commission
- National Park Service
- Natural Resources Conservation Service



THE STATE
of **ALASKA**
GOVERNOR MIKE DUNLEAVY

Department of Natural Resources

OFFICE OF THE COMMISSIONER

550 West 7th Avenue, Suite 1400
Anchorage, AK 99501-3561
Main: 907.269-8431
Fax: 907-269-8918

September 30, 2020

Exxon Valdez Oil Spill Trustee Council
4230 University Drive, Suite 220
Anchorage, AK 99508-4650

Dear Council Members:

Where they are available, State of Alaska, and local government agencies use National Wetlands Inventory (NWI) and National Hydrography Datasets (NHD) in land management, community development, and habitat management decisions. These datasets are currently not available in the Exxon Valdez Oil Spill (EVOS) region. Providing these datasets to decision makers will inform land management, community development, and habitat management decisions in the EVOS and adjacent regions.

The proposed project to concurrently map NWI and NHD in the EVOS region, is logical. It is more cost effective, and will result in higher quality, more seamless data than individual mapping efforts for the two datasets. The maps and data generated will be publicly available and integrated with other data products in the region and used for land and resource management decision making.

As Chair of the Alaska Geospatial Council, and Commissioner of the Department of Natural Resources I support the proposal.

Sincerely,

A handwritten signature in blue ink that reads "Corri A. Feige".

Corri A. Feige
Commissioner Department of Natural Resources
Chair, Alaska Geospatial Council

Thielke, Sydney L

From: Rypkema, James (DEC) <james.rypkema@alaska.gov>
Sent: Wednesday, September 30, 2020 5:30 PM
To: Thielke, Sydney L
Subject: [EXTERNAL] RE: EVSOTC Proposal Update

This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.

Sydney,

I would like to extend my support of your project proposal. The NWI and NHD is used by DEC to inform wastewater permitting decisions for State and Clean Water Act §401 and §402 permits that will support injured species recovery in the EVOS zone. Therefore, I support the proposed project to complete and/or update NWI and NHD across the waters that DEC is responsible for issuing wastewater discharge permits, authorizations, and state water quality certifications.

Jim Rypkema
Program Manager, Storm Water & Wetlands
Wastewater Discharge Authorization Program
Div of Water, Alaska Dept of Environmental Conservation
555 Cordova St; Anchorage, AK 99501-2617
(907) 334-2288 direct; (907) 301-1836 cell
james.rypkema@alaska.gov
<http://dec.alaska.gov/water/wastewater/stormwater>
<http://dec.alaska.gov/water/wastewater/wetlands>



Chugach Regional Resources Commission

Chenega
Eyak
Nanwalek
Port Graham
Qutekcaq
Native Tribe
Tatitlek
Valdez Native
Tribe

May it please the Board,

The **Chugach Regional Resources Commission** (CRRC) can use the NWI and NHD to inform planning decisions, community development and habitat protection activities that will support injured species recovery in the EVOS zone. Therefore, we support the proposed project to complete and/or update NWI and NHD across the lands we manage.

In 2019, CRRC was funded by the Environmental Protection Agency for a Wetland Program Development Grant. Under this award, CRRC will develop and implement a Wetland Program Plan (WPP) for seven Tribes in the Chugach regions who want to protect and restore wetland resources for their economic, environmental and human health benefits.

CRRC is actively working with its seven Member Tribes to gather information and feedback to guide the development of the WPP for land owned and managed by its federally recognized Tribes. This project would not be possible without Tribal involvement and the information they provide on location, health, and function of wetlands and their subsequent priorities for these wetlands. While information and data exist on wetlands in the region the NWI and NHD are outdated, making collaboration with each Tribe to understand their goals, concerns and action items for managing wetland resources in their region that much more crucial.

The Tribal land included in the WPP encompasses approximately 10,000 acres of land in Prince William Sound and Lower Cook Inlet. It is important to note that the Chugach Alaska Corporation is also a major land owner in Southcentral Alaska and would benefit from more complete and updated NWI and NHD.

Best Regards,

Willow Hetrick, Executive Director
Chugach Regional Resources Commission
willow@crrcalaska.org
(907) 330-9085



United States Department of the Interior

NATIONAL PARK SERVICE
Inventory & Monitoring Program - Southwest Alaska Network
240 West 5th Avenue
Anchorage, Alaska 99501

ATTN: Elise Hsieh, Executive Director
Exxon Valdez Oil Spill Trustee Council
430 University Drive; Suite 220
Anchorage, AK 99508-4650

Dear Ms. Hsieh:

I am writing in support of the proposed project titled '*Standardized High-Resolution Wetlands and Hydrography Data across the EVOS Region.*' The project includes watersheds managed by four National Park Service (NPS) park units that fall within the Southwest Alaska Network (SWAN), one of four NPS Inventory and Monitoring (I&M) networks in Alaska. Should this project be funded, it will directly benefit at least two ongoing I&M efforts, outlined below.

- 1) Coastal Marsh Monitoring – The SWAN monitors vegetation in coastal salt marshes and meadows in order to understand how they are changing through time and to inform management of these important areas. Salt marshes are among the most productive ecosystems in the world and provide nursery areas for larval and juvenile fish and shellfish, and stopover areas for migrating shorebirds and waterfowl. They also provide critical habitat for brown bears and are focal areas for bear viewing, and for the businesses that support bear viewing, in Lake Clark and Katmai national parks and preserves.
- 2) Marine Nearshore Monitoring – In collaboration with state and federal partners, the SWAN monitors a number of components of the nearshore environment through the Gulf Watch Alaska program, supported in large part by the *Exxon Valdez* Oil Spill (EVOS) Trustee Council. With this work we try to better understand what drives change in the nearshore ecosystems of Katmai and Kenai Fjords National Park, with an emphasis on key elements of the nearshore food web.

The geospatial datasets stemming from this project will help us to identify wetland and hydrographic features along our coastlines and to examine their connectivity within a watershed context. Completion of the NHD and NWI from headwater streams to the marine environment will enable us to better understand inputs and outputs through the entire hydrologic system, contributing greatly to our monitoring efforts and to our ability to evaluate, respond to, and manage future potential impacts to wetlands within our national parks.

Sincerely,

Amy E. Miller, PhD
Program Manager, Southwest Alaska Network
National Park Service, Inventory & Monitoring Program



October 1, 2020

Exxon Valdez Oil Spill Trustee Council
4230 University Drive, Suite 220
Anchorage, Alaska 99508-4650

Council Members:

The Natural Resources Conservation Service (NRCS) provides conservation technical assistance directly to private landowners across the nation. Our sustainable conservation efforts depend on detailed natural resources data and mapping. A combined National Wetlands Inventory (NWI) and National Hydrography Datasets (NHD) map across the entire EVOS region would result in high quality planning data that will benefit both Federal and private land managers seeking sustainable land use and habitat conservation. The maps and data generated will be valuable to conservation planners within NRCS as well as numerous other Federal, state and private conservation entities.

The NRCS in Alaska supports the NWI-NHD mapping project.

Sincerely,

ALAN MCBEE Digitally signed
by ALAN MCBEE
Date: 2020.10.01
10:43:47 -08'00'

Alan D. McBee
State Conservationist

Alaska
Natural Resources Conservation Service
800 East Palmer Wasilla Hwy, Suite 100, Palmer, Alaska 99645-6574
Voice: (907) 761-7760 Fax: (907) 761-7790

Leslie A. Jones
State of Alaska • Department of Natural Resources • Anchorage, AK
leslie.jones2@alaska.gov

EDUCATION

| | |
|---|-------------|
| Ph.D. Systems Ecology University of Montana, Missoula, MT <i>National Science Foundation Fellow and Montana Institute on Ecosystems Fellow</i> | 2016 |
| M.S. Land Resources and Environmental Science Montana State University, Bozeman, MT | 2012 |
| B.S. Statistics, B.S. Environmental Science, Minor Spanish North Carolina State University, Raleigh, NC | 1996 |

PROFESSIONAL EXPERIENCE

| | |
|--|----------------------|
| Department of Natural Resources - State of Alaska Geospatial Information Officer, Anchorage, AK | 2020- present |
| Alaska Center for Conservation Science – University of Alaska Anchorage Lead Aquatic Ecologist – Anchorage, AK | 2017 - 2020 |
| U.S. Geological Survey – Northern Rocky Mountain Science Center Research Scientist - West Glacier, MT | 2009 – 2017 |
| Trout Headwaters, Inc. Software Programmer/Geospatial Analyst - Livingston, MT | 2007 - 2009 |
| Yellowstone Ecological Research Center Ecological Statistician - Bozeman, MT | 2006 – 2007 |
| Montana State University Research Specialist - Bozeman, MT | 2001 – 2006 |

SELECTED FUNDED PROJECTS

| | |
|------------|--|
| 2019-2022 | Bristol Bay regional temperature sensitivity analysis, <i>Alaska Sustainable Salmon Fund</i> (\$139,005; PI) |
| 2019-2022 | Monitoring protocol development and vulnerability assessment framework for Elodea, <i>USDA Forest Service</i> (\$50,000; co-PI) |
| 2019-2021 | Linking temperature and streamflow to map habitat diversity in the Little Susitna watershed, <i>Matanuska-Susitna Fish Habitat Partnership</i> , (\$66,002; PI) |
| 2019-2021 | Implementing an intensive stream temperature monitoring network for the Lime Hills ecoregion of Bristol Bay, Alaska. <i>Southwest Fish Habitat Partnership</i> (\$79,770; co-PI) |
| 2019- 2022 | AKTEMP: Statewide portal of water temperature data for Alaska. <i>EPA Environmental Information Exchange Network</i> (\$198,545; PI) |
| 2019-2023 | Assessment of stream responses to climate change, wetland loss, and watershed development in Cook Inlet. <i>EPA Wetland Program Development Grant</i> . (\$312,770; co-PI) |
| 2019-2021 | Evaluation of baseline water chemistry from the Nushagak and Kvichak watersheds of Bristol Bay. <i>EPA: Association of Clean Water Administrators</i> (\$29,886; co-PI). |
| 2019–2023 | Scenarios of freshwater biodiversity and ecosystem services in a changing Arctic. <i>Belmont Arctic Biodiversity</i> (\$178,778; PI). |

| | |
|-----------|---|
| 2019-2021 | Assessing thermal sensitivities of salmon habitats in the Cook Inlet, Copper River, and Prince William Sound watersheds. <i>Alaska Sustainable Salmon Fund</i> (\$311,662; PI). |
| 2018-2020 | Bringing state of the art management tools to Alaska: mapping thermal networks using monitoring data. <i>U.S. Fish and Wildlife Service</i> (\$63,118; PI). |
| 2018-2020 | Modeling stream temperature and mapping thermal diversity in south-central Alaska. <i>U.S. Fish and Wildlife Service</i> (\$49,050; PI). |
| 2017-2020 | Coordination for Mapping Alaska's Water. <i>U.S. Fish and Wildlife Service</i> (\$456,778; PI). |
| 2018-2020 | State of Alaska - National Aquatic Resource Assessment. <i>Department of Environmental Conservation</i> (\$212,652; PI). |
| 2018-2019 | Copper River Region Hydrography Updates. <i>U.S. Geological Survey</i> (\$102,586; PI). |
| 2017-2019 | State of Alaska Salmon and People. <i>Gordon and Betty Moore Foundation</i> (\$70,000; collaborator). |
| 2017-2018 | Temperature and flooding as drivers of freshwater habitat suitability for Chinook salmon. <i>Pacific States Marine Fisheries Commission</i> (\$99,819; collaborator). |
| 2012-2016 | National Science Foundation Graduate Research Fellowship- Dissertation: Predicting climate-induced impacts on seasonal stream temperatures in the Crown of the Continent Ecosystem (\$130,000). |

SELECTED PUBLICATIONS

1. Heinle, K., Eby, L., Muhlfeld, C., Steed, A., **Jones, L.**, D'Angelo, V., Whiteley, A.R., Hebblewhite, M. 2020. Influence of water temperature and biotic interactions on the distribution of Westslope Cutthroat Trout (*Oncorhynchus clarkia lewisi*) under climate change. *Canadian Journal of Fisheries and Aquatic Science*.
2. **Jones, L.**, Schoen, E., Shaftel, R., Cunningham, C., Mauger, S., Rinella, D., St. Saviour, A. 2020. Regional and water-shed-scale climate drivers influence Chinook salmon productivity in southcentral Alaska. *Global Change Biology*.
3. Shaftel, R., Mauger, S., Falke, J., Rinella, D., Davis, J., and **Jones, L.** 2020. Thermal diversity of salmon streams in the Matanuska-Susitna Basin, Alaska. *Journal of American Water Resources Association*.
4. **Jones, L.**, Muhlfeld, C., Marshall, L. 2017. Projected warming portends seasonal shifts of stream temperatures in the northern Rocky Mountains, USA and Canada. *Climatic Change*. 144:4, 641-655.
5. Giersch, J., Hotaling, S., Kovach, R., **Jones, L.**, Muhlfeld, C. 2017. Climate-induced glacier and snow loss imperils alpine stream insects. *Global Change Biology*. 23:7, 2577-2589.
6. **Jones, L.**, Muhlfeld, C., Hauer, R. 2016. Chapter 6: Temperature. *Methods in stream ecology* (3rd Edition). Elsevier. Academic Press. New York.
7. Giersch, J., Jordan, S., Luikart, G., **Jones, L.**, Hauer, R., and Muhlfeld, C. 2015. Climate-induced range contraction of a rare alpine aquatic invertebrate. *Freshwater Science*. 34:1.
8. Pierce, R., Podner, C., and **Jones, L.** 2015. Long term increases in trout abundance following channel reconstruction, instream wood placement, and livestock removal from a spring creek in the Blackfoot Basin, Montana. *Transactions of the American Fisheries Society*. 144, 184-195.
9. Al-Chokhachy, R., Muhlfeld, C.C., Boyer, M.C., **Jones, L.A.**, Steed, A., and Kershner, J.L. 2014. Quantifying the effectiveness of conservation measures to control the spread of anthropogenic hybridization in stream salmonids: a climate adaptation case study. *North American Journal of Fisheries Management*. 34, 642-652.
10. **Jones, L.A.**, Muhlfeld, C.C., Marshall, L., McGlynn, B., and Kershner, J. Estimating thermal regimes of Bull Trout and assessing the potential effects of climate warming on critical habitats. 2014. *River Research and Applications*. 30, 204-216.
11. Landguth, E.L., Muhlfeld, C.C., Waples, R.S., **Jones, L.**, Lowe, W.H., Whited, D., Lucotch, J., Neville, H., and Luikart, G. 2014. Combining demographic and genetic factors to assess population vulnerability in stream species. *Ecological Applications*. 24:6, 1505-1524.
12. Muhlfeld, C.C., Kovach, R.P., **Jones, L.A.**, Al-Chokhachy, R., Boyer, M.C., Leary, R.F., Lowe, W.H., Luikart, G., and Allendorf, F.W. 2014. Invasive hybridization is accelerated by climate change in a threatened species. *Nature Climate Change*. 4, 620-624.

Sydney Thielke

1011 E. Tudor Rd MS-361, Anchorage, AK 66503 | 907-229-6308 | Sydney_thielke@fws.gov

Summary

- A federal employee involved in landscape scale inventory and mapping activities across Alaska.

Education

M.S. APPLIED GEOGRAPHIC INFORMATION SCIENCES | MAY 2008 | NORTHERN ARIZONA UNIVERSITY

- Thesis: Predicting Off Highway Vehicle Use areas in the Arizona Strip using GIS

B.S. LAND RESOURCE ANALYSIS AND MANAGEMENT | MAY 2005 | MONTANA STATE UNIVERSITY

Experience

REGIONAL WETLANDS COORDINATOR | DOI-USFWS | MAY 2019-CURRENT

- Location: Anchorage, AK
- Coordinate the National Wetlands Inventory (NWI) across the Alaska
- Serve as a technical representative to the Alaska Mapping Executive Committee

RESOURCE CONSERVATIONIST AND GIS COORDINATOR | USDA-NRCS | SEPTEMBER 2013-MAY 2019

- Location: Palmer, AK
- Coordinate geospatial data management and mapping activities for NRCS Alaska
- Serve as a technical representative to the Alaska Mapping Executive Committee

GIS SPECIALIST AND RECREATION TECHNICIAN | DOI-BLM | JUNE 2017-SEPTEMBER 2013

- Location: Lander, WY
- Coordinate geospatial data management and mapping activities for the Lander Field Office
- Perform complex geospatial analysis Project Oversight and Collaboration

NATIONAL WETLANDS INVENTORY PROJECTS

- Current FWS funded NWI projects with contracted work performed by
 - St. Mary's University of Minnesota (GeoSpatial Services)
 - Andy Robertson, aroberts@smumn.edu, 507-457-8746
 - SWCA
 - Tim Griffith O'Neill, TGriffith-Oneill@swca.com, 503-914-6056

NATIONAL HYDROGRAPHY DATASET PROJECTS

- Current FWS funded NHD projects with contracted work performed by
 - AKHydro (University of Alaska Anchorage)
 - Kacy Krieger, kekrieger2@alaska.edu, 208-801-9869

Brian Wright

4210 University Drive, Anchorage, AK 99508 | 907-201-0113| bwright@usgs.gov

Summary

- Geographer with a focus on federal interagency coordination of statewide mapping themes to produce topographic maps

Education

GEOGRAPHIC INFORMATION SCIENCES CERTIFICATE PROGRAM | MAY 2003 | NORTHERN ARIZONA UNIVERSITY

- Focus on remote sensing application within geospatial information systems

B.S. NATURAL RESOURCE MANAGEMENT - LAND USE PLANNING | DECEMBER 1997 | UNIVERSITY OF WISCONSIN - STEVENS POINT

Experience

NATIONAL MAP LIAISON | DOI-US GEOLOGICAL SURVEY | MARCH 2015-CURRENT

- Location: Anchorage, AK
- Coordinate the update of the statewide National Hydrography Dataset
- Serve as a technical representative to the Alaska Mapping Executive Committee

GIS SPECIALIST | DOD-US ARMY | FEBRUARY 2013-FEBRUARY 2015

- Location: Fort McCoy, Wisconsin
- Coordinate geospatial data management and mapping for long range sustainability of training lands

GIS ANALYST | DOD-NATIONAL GEOSPATIAL INTELLIGENCE AGENCY | JANUARY 2007-JANUARY 2013

- Location: Stuttgart Germany
- Geospatial Liaison to EUCOM and AFRICOM Theaters

NATIONAL HYDROGRAPHY DATASETS PROJECTS

- Utilize Alaska Mapping and Modernization funding for federal partnerships to update hydrography for federal lands.
 - St. Mary's University of Minnesota (GeoSpatial Services)
 - Andy Robertson, aroberts@smumn.edu, 507-457-8746
 - University of Alaska - Anchorage
 - Kacy Krieger, kekrieger2@alaska.edu, 208-801-9869