

Wetland Mapping Consortium Project Summary January 2012

At the end of 2011 Wetland Mapping Consortium participants were asked to share information about the projects they had underway and indicate whether they would be interested in giving a webinar presentation on their work to other members of the Wetland Mapping Consortium. Below is the information that was submitted. This is only a sampling of the work underway by WMC participants.

Project Title: Wetland Delineation Using High Resolution Aerial CIR Imagery for New Gas Pipeline Corridors in Alaska

Project Description: Detailed mapping of wetlands to be used for the Environmental Impact Statement of a new +/- 600 mile gas pipeline in Alaska. The mapping was completed using Cowardin classification and also used HGM attributes to provide some description of wetland function. The project crossed a range of landscape types including tundra, alpine, boreal and coastal areas.

Contact(s) for More Information – Andy Robertson 507-457-8746, aroberts@smumn.edu

Would you be interested in making a presentation on this project? Yes

Does it fit into one of the topics of webinars described for the coming months? NWI Mapping

Project Title: Identifying Restorable Wetland Opportunities in Wyoming

Project Description: Use of a variety of existing (SSURGO, NWI, DEM) and generated (filled DEMs, topographic basins, hydrologic flow networks) data sets to identify and restorable wetland opportunities across the state.

Contact(s) for More Information – Andy Robertson 507-457-8746, aroberts@smumn.edu

Would you be interested in making a presentation on this project? Yes

Does it fit into one of the topics of webinars described for the coming months? Restorable Wetlands Data

Project Title: Wetland Mapping and Classification for Northeastern New Mexico

Project Description: Remote data sources (NAIP, County based CIR, NMED collateral data) are being used to update wetland delineation and classification across a 6000 sq mi study area in NE NM. Wetlands are being classified using NWI, NM RAM and LLWW and will be assessed for functional characteristics.

Contact(s) for More Information – Andy Robertson 507-457-8746, aroberts@smumn.edu

Would you be interested in making a presentation on this project? Yes

Does it fit into one of the topics of webinars described for the coming months? NWI Mapping

Project Title: Scalable Wetland Mapping Techniques for Original NWI Map Development in Alaska – A Case Study from the Yukon River Delta

Project Description: Using traditional and automated wetland mapping techniques (including image segmentation using eCognition and regression tree analysis) to develop cost effective wetland mapping across large geographic areas. This project incorporates the use of a wide variety of collateral data at a range of scales to improve confidence in wetland delineation and classification.

Contact(s) for More Information – Andy Robertson 507-457-8746, aroberts@smumn.edu

Would you be interested in making a presentation on this project? Yes

Does it fit into one of the topics of webinars described for the coming months? Automation Techniques for Mapping Wetlands

Project Title: Wetland Update for the St. Croix Headwaters Watershed, WI – NWI, WWI LLWW and Functional Assessment

Project Description: Remote data sources (NAIP, County based CIR, WI DNR collateral data) were used to update wetland delineation and classification across a 300 sq mi study area in northern WI. Wetlands were classified using NWI, WWI and LLWW and were then assessed for functional characteristics and assigned to 11 function categories including: surface water detention, water maintenance; nutrient transformation; sediment retention, carbon sequestration; shoreline stabilization, fish habitat, waterfowl habitat, shorebird habitat, amphibian habitat and other wildlife habitat.

Website and/or links to more information (if available):

<http://www.mvp.usace.army.mil/environment/default.asp?pageid=1323>

Contact(s) for More Information – Andy Robertson 507-457-8746, aroberts@smumn.edu

Would you be interested in making a presentation on this project? Yes

Does it fit into one of the topics of webinars described for the coming months? Several, definitely.

Project Title: Topographic Metrics for Improved Mapping of Forested Wetlands

Project Description: We investigated the predictive strength of forested wetland maps produced using digital elevation models (DEMs) derived from Light Detection and Ranging (LiDAR) data and multiple topographic metrics, including multiple topographic wetness indices (TWIs), a TWI enhanced to incorporate information on water outlets, normalized relief, and hybrid TWI/relief in the Coastal Plain of Maryland. LiDAR based mapping products were compared to highly accurate maps of inundation and current wetland maps. Mapping methods based on topographic metrics contained fewer errors of omission than a currently available wetland map and included similar areas of flooded forest. These results indicate that LiDAR based topographic metrics have potential to improve accuracy and automation of wetland mapping.

Contact(s) for More Information – Megan.Lang@gmail.com, 301-504-5138

Would you be interested in making a presentation on this project? Sure.

Does it fit into one of the topics of webinars described for the coming months? I would suggest a new seminar on use of topographic indices to map wetlands.

Project Title: LiDAR Mapping of Wetland-Stream Connectivity

Project Description: The spatial relationship between wetlands and streams influences their structure and function, and is currently tied to the regulatory status of wetlands. Efforts have been made to assess connectivity between wetlands and streams and possible management implications by comparing existing wetland and stream maps (e.g., National Hydrography Dataset [NHD]) but the reliability of these assessments is affected by the accuracy and inherent nature of input datasets. Stream datasets derived using semi-automated and automated interpretation of LiDAR derived digital elevation models were found to be considerably more accurate than NHD High Resolution (12% less accurate than automatically generated streams) and Plus (29% less accurate than automatically generated streams) and in general use of LiDAR

derived datasets was found to significantly increase percent area and total number of wetlands that were considered connected at multiple buffer lengths ranging from 0 to 80 m. When wetland-stream connectivity as judged using NHD was compared to a semi-automatically generated highly accurate LiDAR derived stream dataset, the High Resolution NHD was found to underestimate semi-natural palustrine wetland area connected by 15% and number of wetlands connected by 13% on average while NHD Plus was found to underestimate semi-natural palustrine wetland area and number connected by 27% on average.

Contact(s) for More Information – Megan.Lang@gmail.com, 301-504-5138

Would you be interested in making a presentation on this project? Sure.

Does it fit into one of the topics of webinars described for the coming months? It somewhat fits into the LiDAR topic but I don't think that more speakers are needed for that seminar. Perhaps we could have an isolated wetlands seminar. It would fit there.

Project Title: SAR to map forested wetland hydrology

Project Description: We are using C-band SAR to map hydrology (inundation and soil moisture) at a 2,000 acre WRP site in Somerset County, Maryland where it has previously been very difficult to map wetlands using optical data. Maps of soil moisture and inundation compare well to ground data. This site has been mapped pre-restoration (2011) and will be mapped post restoration (2012). Quantifying acres restored will increase accountability, improve the effectiveness of management practices, and promote additional restorations in this environment.

Contact(s) for More Information – Megan.Lang@gmail.com, 301-504-5138

Would you be interested in making a presentation on this project? Sure

Does it fit into one of the topics of webinars described for the coming months? No

Project Title: Monitoring Wetland Changes Using Multitemporal Landsat Change Detection, Web Mapping Services, and Crowd Sourcing

Project Description: Despite various federal, state, and local wetland protection laws, both permitted and non-permitted wetland losses continue. Many change detection techniques using pairs of Landsat data can detect changes in wetlands. However, most of these techniques also have high commission errors preventing automation of the process without image analysts

reviewing and removing the commission errors. MDA's Correlated Land Change (CLC) process, which uses many Landsat scenes in a multitemporal change detection approach, was designed to eliminate commission errors. The CLC process begins with a multitemporal stack of coregistered Landsat multispectral scenes. Using MDA's patented CCA (Cross Correlation Analysis) change procedure, a change measure is calculated, on a pixel-by-pixel basis, between all possible 2-image-pair permutations within the multitemporal image stack. The CLC process then applies multitemporal templates to discern patterns of man-made change within this vast collection of pair-wise change analyses. This process has been shown to eliminate most commission errors created by clouds, seasonal changes in natural vegetation, and changes created under standard agricultural practices. Plans are to create a publicly available web mapping service that will allow the user to display the US Fish and Wildlife Service's National Wetland Inventory data, the CLC product identifying areas and dates of change, and will provide a user interface enabling users to describe the changes that have occurred to the wetland. It is anticipated that this crowd sourcing technique, by adding comments and photos of the change directly into the web mapping service, will prove to be another deterrent to wetland losses. The web mapping service will be demonstrated and will include crowd-sourced photos and comments posted describing the wetland changes in the Orlando, FL area.

Contact(s) for More Information: MDA Information Systems, Inc., Geospatial Division, 820 West Diamond Ave., Suite 300, Gaithersburg, Maryland 20878; 240-833-8200

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- 4 - Adam.Estrada@MDAUS.com
- 5 - Greg.Koeln@MDAUS.com (Presenter and Correspondence Author)

Project Title: Mapping and Classification for Wetlands Protection, Northeastern New Mexico Highlands and Plains

Project Description: As part of our landscape level 1 assessment strategy, NMED SWQB Wetlands Program is utilizing geospatial techniques and image interpretation processes to remotely map and classify wetlands and riparian areas of the Canadian River drainage in northeastern New Mexico (complying with FGDC Standards for inclusion in the National Wetlands Inventory). As a demonstration we are applying the LLWW mapping classification and descriptors for landscape level assessment tailored to arid region wetlands, and assigning subclasses to prepare for our RAM development in the Canadian River watershed. The project study area covers the Canadian River watershed from the Colorado/New Mexico border to the

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Conchas Reservoir and includes tributaries, playas and isolated wetlands. The area covers approximately 5,800 sq. miles (~100 quadrangles).

Contact(s) for More Information – Maryann McGraw, 505-827-0581, maryann.mcgraw@staten.nm.us; Shelly Barnes, 505-827-2827, michelle.barnes@state.nm.us

Would you be interested in making a presentation on this project? We are just beginning the project and may be interested in presenting in 2013.

Does it fit into one of the topics of webinars described for the coming months? Yes. We are not ready to present at this time.

Project Title: Mapping of Wetland and Floodplain Landscapes

Project Description: SSURGO soils data and High Resolution DED will be used to map wetland landscape positions. The spatial boundaries will be defined as HGM wetland classes. The spatial boundaries will also be coincident with Ecological Sites for Ecological Site Description (ESD) development. NRCS has a critical need for HGM models and has an ongoing ESD effort. An NRCS workshop is scheduled for January, 2012 to determine protocols. The workshop participants include biologists, soil scientists, GIS specialists, and Ecological Site Inventory specialists from Michigan, Indiana, Ohio, Wisconsin, and other states in the Great Lakes region.

Contact(s) for More Information – Richard A. Weber, Wetland Hydraulic Engineer, Wetland Team, NRCS-CNTSC, Fort Worth Texas. Richard.weber@ftw.usda.gov 817-509-3576

Would you be interested in making a presentation on this project? Yes

Does it fit into one of the topics of webinars described for the coming months? It has implications for several of the future discussion topics

Project Title: Remote Sensing of Woodland Vernal Pools in Massachusetts

Project Description: (short description of project including purpose, geographic extent, type of imagery used or planned, ancillary data, completion date, anything unique or unusual about the project.)

Isolated wetlands (IWs) are found throughout the U.S. (Tiner 2003), and while there are some data on the spatial extent of IWs in certain areas, identifying IWs can be an expensive and time consuming exercise, especially when ground-truth data are necessary. We have had success at using GIS and remote sensing data in previous studies (e.g., Reif et al. 2009, Frohn et al. 2009,

Frohn et al. accepted) to find IWs in Florida and NE Ohio more efficiently (i.e., less expensive and quicker) than with traditional methods. Our rates of user accuracy, which measures errors of commission, and producer accuracy, which measures errors of omission are from 93 to 100% and 86 to 95%, respectively (Reif et al. 2009, Frohn et al. in press). In this exploratory study, we seek to build on the Florida and Ohio studies and use additional data layers remotely identify a different class of wetlands in Massachusetts.

We have identified an area in central Massachusetts for inclusion in this study (Figure 1). This area was selected after acquiring GIS data from the Massachusetts Certified Vernal Pool program (see www.mass.gov/mgis/cvp.htm) that showed a high concentration of vernal pools in the selected area. We have acquired high-resolution leaf-off digital imagery (Quickbird, 60-cm resolution) as well as 30-m spatial resolution Landsat ETM+ data for the study area. We will develop models based on the spectral signature of vernal pools in the remotely sensed data. Possible sources of error include false positives (i.e., identifying a point as a vernal pool when it is not) and false negatives (i.e., not finding an existing vernal pool). While there are no established guidelines for an effective model, we are aiming for >80% in both user and producer accuracy.

We hope to complete this project by the end of calendar 2012.

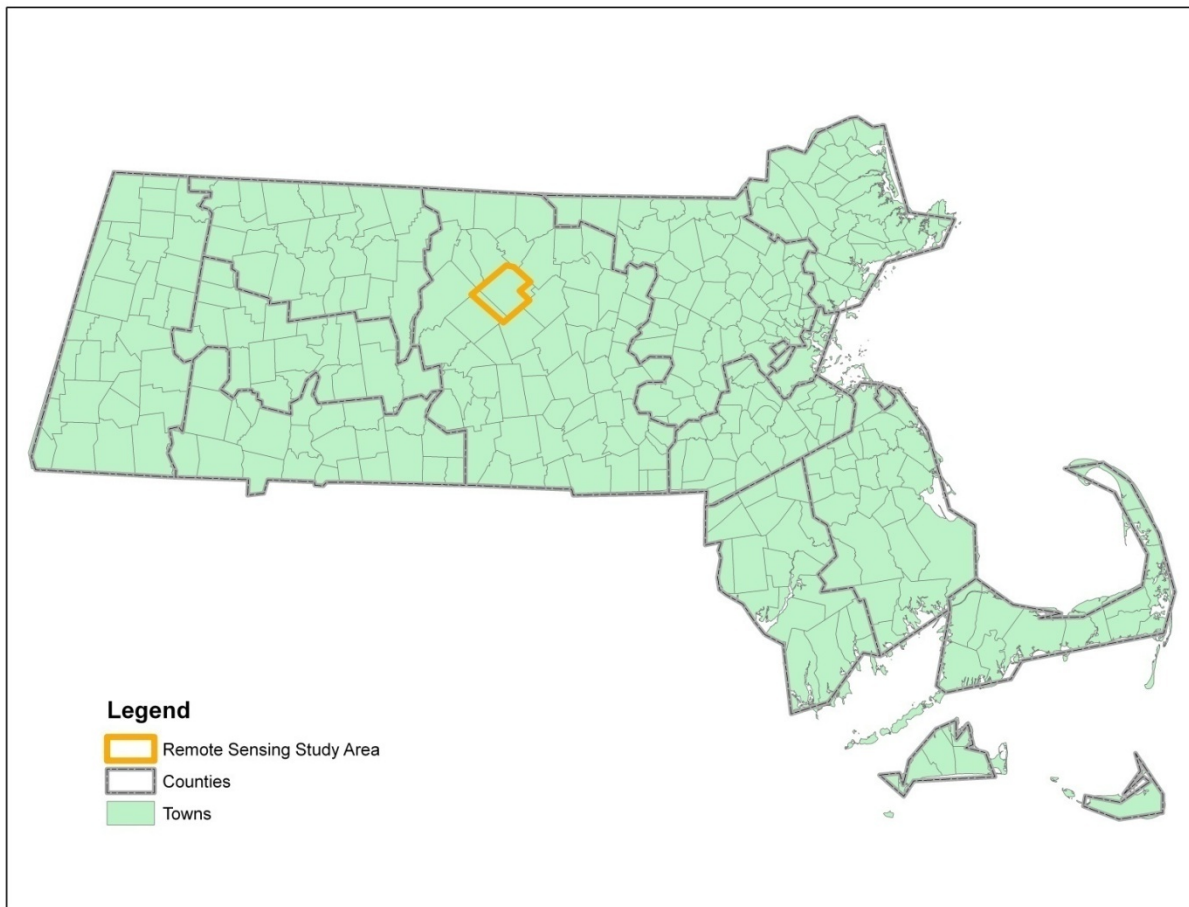


Figure 1. Selected study area in central Massachusetts.

References

Frohn, R.C., M. Reif, C.R. Lane, and B. Autrey. 2009. Satellite remote sensing of isolated wetlands using object-oriented classification of Landsat-7 data. *Wetlands* 29(3):931-941.

Frohn, R.C., E. D'Amico, C. R. Lane, B. Autrey, J. Rhodus, and H. Liu. Accepted. Multi-temporal sub-pixel Landsat ETM+ classification of isolated wetlands in Cuyahoga County, Ohio, USA. *Wetlands*.

Reif, M., R.C. Frohn, C.R. Lane, and B. Autrey. 2009. Mapping isolated wetlands in a karst landscape: GIS and remote sensing methods. *GIScience and Remote Sensing* 46(2):187-211.

Tiner, R.W. 2003. Estimated extent of isolated wetlands in selected areas of the United State. *Wetlands* 23(3):636-652.

Contact(s) for More Information – Charles Lane, US EPA Research Ecologist, 513-569-7854, lane.charles@epa.gov

Would you be interested in making a presentation on this project? – Yes, but not until we have results (!).

Does it fit into one of the topics of webinars described for the coming months? No

Project Title: Great Northern LCC and BLM Great Basin LLC, Region 1 FWS

Project Description: The Region is working with the Great Northern Landscape Conservation Cooperative and the Bureau of Land Management to convert scans into digital data, update maps and create new data for unmapped areas. The Service is interested in updating and modernizing 102 quads in the Coeur d'Alene River Basin to be used by the Natural Resource Damage Assessment (NRDA) and Restoration Trustees for wetland restoration planning. Additionally, inventory data was used to map feeding habitat for Tundra Swans in the Coeur d'Alene Basin. The map was then used in the calculation of the injury to this species from the release of lead into the feeding habitat and damages associated with a NRDA and Restoration case.

Contact(s) for More Information:

Would you be interested in making a presentation on this project?

Does it fit into one of the topics of webinars described for the coming months?

Project Title: FWS Projects, Region 1

Project Descriptions: Ridgefield and Willapa NWRs

The Region and Ducks Unlimited are interested in updating the channeled scablands of eastern Washington. The scablands were created by glaciers and cataclysmic floods, and provides extremely important waterfowl breeding habitat for species such as mallards, redhead, teal (blue wing, green wing, cinnamon), ruddy ducks and large Canada geese. The Service will continue ongoing mapping for the Ridgefield National Wildlife Refuge, and will likely start Willapa and Julia Hansen Butler refuges in 2011.

Maui and Adjacent Lands, Region 1 FWS

There are 410 species on the Federal Endangered species list for Hawaii and many are associated with stream and wetland habitats. The Region is working with the State and the Pacific Islands Fish and Wildlife Office on a funding strategy to update the remaining islands as this data will be needed to aid decision making on conservation actions to perpetuate the unique natural resources of the Pacific Islands.

With the completion of the update for Kauai, the Region is working with the Pacific Islands Fish and Wildlife Office and the state to have the Alikai Swamp, a high elevation wetland, designated as a World Wetland Ramsar Site.

Contact(s) for More Information: William Kirchner, 503-231-2050, Bill_Kirchner@fws.gov

Project Title: FWS Projects, Region 2

Project Description: Whooping Crane Pilot

Wetland update and new mapping/data collection are ongoing in the Great Plains LCC. TX Tech Univ. is completed a 4 county project area that will be a pilot study to determine if NWI data can be used to model Whooping crane stopover habitat. Region 2 has undertaken a small, in-house pilot project to help determine Whooping Crane stopover habitat through their migration corridor in Kansas (R6) and Oklahoma (R2), which is integral in the development of the Habitat Conservation Plan (HCP) for the Whooping Crane, currently underway by USFWS Regions 2, 6, States, and Energy Companies. Wind energy companies involved in this endeavor include; Horizon, Acciona, BP, NextEra, Iberdrola, as well as others. Additional partners in the development of the HCP include the states of Montana, North Dakota, South Dakota, Nebraska,

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Kansas, Oklahoma, Colorado, New Mexico, and Texas. This bi-regional HCP will be the first of its type in the country to involve alternative fuel sources and climate change issues while protecting imperiled species on a landscape level. This data will help guide Energy Companies currently planning wind energy projects, to avoid these important stopover habitats in their project planning. Cranes will only use wetlands which meet specific criteria, for stopovers. These criteria include proximity to human development, vegetation cover, and water depth. The Whooping Crane corridor almost bisects the Great Plains LCC, and ends in the Gulf Coast Plains and Ozarks LCC. Little work has been done on stopover habitats in Kansas, Oklahoma, and inland Texas due to the lack of current or digital NWI data. This project will start to fill those data gaps. Preliminary modeling should be completed early in FY 12.

Canadian Watershed

On the heels of the very successful New Mexico Wilderness mapping effort, which helped initiate Statewide wetlands protection legislation, the State's Surface Water Quality Bureau (SWQB) and NWI will continue efforts to map and gain protection for wetlands throughout the state. Work was completed in the La Cienega watershed, south of Santa Fe. This watershed harbors unique spring fed wetland/riparian complexes, due to the areas geologic structure. These wetland features have been a focal point of civilization in this part of New Mexico for many hundreds of years, providing a consistent water source for agriculture. Now this area faces development pressures as the Santa Fe area expands. Wells for housing developments are beginning to impact flow from some of these springs. The creation of this wetland data layer is the first step in a water quality monitoring program the SWQB is designing for this watershed.

Playa Lakes III New and Update, Region 2 FWS

Texas Tech contributed 15 more counties worth of wetlands data in the Texas panhandle/playa lakes region. This now completes update and new mapping for the entire playa lakes region in TX, opening the door for landscape level analysis for these threatened wetland habitats. If funding is available, Region 2 and Texas Tech will attempt to construct climate change models for the playa lakes region in TX.

Contact(s) for More Information: Jim Dick, 505-248-6660, jim_dick@fws.gov

Project Title: FWS Projects, Region 3

Project Description: MN Updates, Region 3 FWS

The wetland status and trends monitoring program is a random sample survey designed to provide an ongoing assessment of the gain and loss of wetland acres in Minnesota. Initiated in

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the spring of 2006, this project involves the periodic acquisition and interpretation of aerial photography on nearly 5,000 permanent sample plots scattered around the state. Wetland gain and loss is determined by comparing subsequent photos of each sample plot using GIS technology.

Wetland quantity measurements are made using photo-interpretation of high-resolution natural color stereo-imagery for randomly selected 1-square mile plots, known as primary sampling units (PSU). The survey uses a cyclical, interpenetrating panel structure based on the Generalized Random Tessellation Stratified (GRTS) design to ensure that random samples are spatially distributed across the state (Stevens and Olsen 2004). Imagery is acquired, and photo-interpretations are performed for 1830 PSUs each year. Of these, 1580 PSUs are assigned to one of three repeating panels and interpreted every third year and 250 PSUs are interpreted every year.

Website and/or links to more information (if available):

http://www.dnr.state.mn.us/eco/wetlands/nwi_proj.html

Contact(s) for More Information: Lian Rampi, Joe Knight, Bryan Tolcser; U of Minnesota; Brian Huberty, FWS, 612-713-5292, brian_huberty@fws.gov

Project Title: FWS Projects, Region 4

Project Description: FLUCCS: Florida Land Use Land Cover Classification System

NWI FLEX funding has been contracted to Virginia Tech through the CESU (Cooperative Ecosystems Studies Unit) agreement. This project will convert the Florida FLUCCS (Florida Land Use Land Cover Classification System) data to the NWI Cowardin classification standard. This project is in 2 phases. Phase 1 (FY12) will generate updated NWI for the southern half of the state (312 quads) and Phase 2 (FY13) will generate data to complete the Florida Peninsular LCC (320 quads).

Refuges Updates, Region 4 FWS

By the end of the calendar year, NWI maps will be updated for three FWS refuges within the Southeast Region with funds received from the Refuge Inventory & Monitoring Program (I&M). The following refuges: D'Arbonne, Black Bayou and Upper Ouchita will be updated for a total of nine topographic maps. Additional I & M funding was received in FY 11 for updated wetlands data for the Cache River Refuge. A total of 22 topographic maps will be updated.

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NWI Pilot, Region 4 FWS

A unique NWI project is currently underway at East Carolina University (ECU). This pilot study assesses the feasibility and accuracy potential for automating mapping for the National Wetland Inventory (NWI). The methodology will use an array of multidecade SAR imagery (ALOS PALSAR) and LiDAR-derived rasters (minimum elevation, vegetation canopy height, slope, and curvature) in combinations. Initial results illustrate strong potential for multidecade SAR imagery and enhanced accuracy achievable by integration of vegetation canopy LiDAR for broad-scale mapping of coastal wetland vegetation change.

Contact(s) for More Information: John Swords, 413-253-8623, john_swords@fws.gov

Project Title: FWS Projects, Region 5

Project Description: Region 5's NWI Program continues to work on updating and enhancing wetland maps and digital data and reporting the findings of these inventories and special projects. This year we produced updated digital data for central and western Massachusetts, Rhode Island, Delaware, and Cape May and Eastern Neck National Wildlife Refuges. We've also been working with our cooperator Virginia Tech on a number of other update projects that should be completed in FY 12. One of these projects is for updating and enhancing NWI data for the entire state of Connecticut – a project funded by the state.

Besides standard NWI mapping and digits, Region 5 is coordinating a national project focusing on updating and enhancing NWI data in priority areas along the Atlantic and Gulf Coasts. These protocols have been applied to large geographic areas in South Carolina, Mississippi, and Texas and the draft data were reviewed in FY11 and will be summarized in report form in FY12.

Contact(s) for More Information: Ralph Tiner, 413-253-8620, ralph_tiner@fws.gov

Project Title: FWS Projects, Region 6

Project Description: The Snake Valley hydrographic basin straddles the Utah-Nevada border from Fish Springs National Wildlife Refuge (NWR) in Utah to Great Basin National Park (NP) in Nevada. Spring water and groundwater have both been used historically to support local agricultural practices in this rural area. The Southern Nevada Water Authority (SNWA) developed and maintains a comprehensive Water Resource Plan, a part of which includes applying for water rights to pump groundwater from the basin to the Las Vegas metropolitan area. A baseline inventory of the physical habitat conditions of the wetlands in the valley has

been produced to show the location, extent, and type of locally occurring wetland habitats. A shallow groundwater monitoring network has also been installed to provide data on the contemporary hydrology supporting these wetland communities, and will be used to gain a greater understanding of the long-term behavior of the groundwater system and vegetation community response to fluctuations in the water table. This data will be used for making land-use management decisions.

The proposed groundwater depletions could negatively impact the water table and surface water flows, in turn impacting the habitat communities in the Refuge and Park. A variety of sensitive species, endemic snails and fish, and species of concern inhabit these areas and may also be negatively impacted.

Several federal and state agencies are actively involved in this issue including: the Fish and Wildlife Service (FWS), the Bureau of Land Management (BLM), the Utah Geological Survey, the Utah Division of Wildlife, and the Utah Division of Water Rights.

Contact(s) for More Information: Kevin Bon, 303-236-4263, kevin_bon@fws.gov

Project Title: FWS Projects, Region 7

Project Description: In FY 2011, NWI worked cooperatively with many other Service and Agency partners to provide a wide variety of valuable wetland and geospatial data products and services to assist in meeting National and Regional goals.

Six new projects were funded and completed in support of strategic wetlands mapping with LCCs and climate change- and energy-related applications. Five projects provided for the scanning and attributing of existing NWI hard-copy separates to expand the digital data coverage for the Arctic, Northwestern Interior Forests, Western Alaska and North Pacific LCCs:

Arctic Coastal Plain, Southern Foothills and Gasline Corridor quads of the Arctic LCC;

Tran Alaska Pipeline (TAPs) and Haul Road Corridor quads of the Northwestern Interior Forests LCC;

Interior, Copper River Basin, and South Central Alaska quads of the Northwestern Interior Forests and Western Alaska LCCs;

Lower Cook Inlet, South Central Alaska and Bristol Bay Coastal Watershed quads of the Northwestern Interior Forests and Western Alaska LCCs; and

Southeast Alaska wetlands data layer of remaining nondigital NWI quads of the Tongass National Forest and North Pacific LCC.

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These projects together covered 140.5 1:63,360-scale quads (562.1 quarter quads) representing 19.79 mil acres, and are intended to support change analysis, and further the study of wetland gains or losses and migratory bird habitat changes related to climate change. Those quads covering the TAPs corridor, Haul Road, Arctic Coastal Plain and coastal Bristol Bay and Cook Inlet are anticipated to be used by the Service and its Partners for energy-related project reviews in coastal areas and along proposed gas and oil pipeline routes.

The sixth project completed in 2011 was a pilot study that extended new NWI mapping along the southern border of previously mapped North Slope areas in the Brooks Range Foothills of the Arctic LCC (approximately 606,423 mil acres). The ability to implement these new mapping techniques is intended to provide one means of reconnaissance-level mapping for remote areas at a cost savings to the NWI program.

Contact(s) for More Information: Jerry Tande, 907-786-3488, jerry_tande@fws.gov

Project Title: FWS Projects, Region 8

Project Description: Refuge Strategic Initiative for Sacramento NWR Complex

The purpose of this initiative was to produce contemporary digital data that will allow for more efficient project evaluation and assessment of impacts to the species of concern at each refuge. The digital data will be extremely valuable for refuge planning efforts (e.g., Comprehensive Conservation Plans, CCP). Each refuge has its own unique purpose and separate challenges that need to be addressed in the framework of the CCP. In continuation of this strategic initiative, Refuges provided 2010 funding to complete updates on Sacramento NWR Complex and the work was completed in FY 2011. Refuges has also provided 2011 funding to complete updating of full USGS topographic quadrangles for lands surrounding the refuge complex. This will provide current wetlands data for easement properties important to the refuge.

Salinas Valley, California

The Salinas River is the principal river system on the central coast of California, flowing northward approximately 170 miles and emptying into Monterey Bay. The primary use of the Salinas River Valley has been agriculture. Steelhead fisheries within the Salinas River and its tributaries have declined over the years and water quality has degraded. Recent years have seen an increase in vineyards requiring irrigation water that has further degraded the river system. In 2009 California State University Monterey Bay (CSUMB) was tasked through a CESU Agreement to map 18 quads in the Salinas Valley River Basin. This was the third Salinas Valley project; previously 41 quads were completed by CSUMB. In FY 2010 five additional quads were

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added to the contract because funds remained in the contract, these data were completed in 2011. These new and updated wetlands data are available on the Central Coast Wetlands Group at Moss Landing Marine Laboratories website at <http://ccwg.mlml.calstate.edu/resources/data-center/mapping-tools/central-coast-wetland-mapper>.

NWI/State of California Wetlands Inventory Partnership

This is a continuation of the 2003 partnership with the Southern California Coastal Wetland Research Program (SCCWRP) to produce digital wetland data in many priority areas on the South Coast of California. We continue to work with California State University Northridge and completed an additional 30 quads (1 million acres) of new and updated mapping this in FY2011. This partnership will continue with four priority areas to be completed in 2012 and three in 2013.

Bay Area Aquatic Resources Inventory

(BAARI) data crosswalk **BAARI**, a project of the San Francisco Estuary Institute (SFEI), is a highly detailed base map of the Bay Area's aquatic features that includes all wetlands, open water, streams, ditches, tidal marshes and flats, and riparian areas. BAARI will be used to track changes in the extent and condition of aquatic habitat, aid in ecological sample drawing, and ultimately will be featured on the [California Wetlands Portal](#), where users can browse the area's aquatic features and restoration projects on an interactive map. The Pacific Southwest NWI provided FY2011 funding and will be working with SFEI and a contractor to establish a GIS model for the conversion of BAARI data to NWI map standards. This cooperative project, starting with 35 USGS quads, will ultimately set guidance for the conversion of 106 USGS quads included in the BAARI project watersheds.

Developing Partnerships with the State of Nevada

Nevada is currently 79 percent digital at a scale of 1:250K; this scale does not meet current FGDC data standards for wetlands mapping. There has been little coordination done with Nevada in recent years and 2011 will see an effort to develop contacts and partnerships, through outreach efforts, with State, County, Tribal, and local agencies.

The most recent mapping done in Nevada was Pahrangat NWR with Refuges I&M funding. Before that, the Reno/Carson Springs area was updated in 1999. There is a huge need for updated and standard compliant data in Nevada due to the large number of renewable energy projects that are occurring in the state.

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The Pacific Southwest NWI attended the Nevada Geographical Information Society's Annual Conference with a display in the Exhibition Hall and as a speaker, getting involved in the Data Working Group of the Desert LCC. No mapping was funded in 2011 related to renewable energy projects; partnership development is a crucial step in increasing funding for this effort.

Fallon NV and the Stillwater NWR

One project under consideration is Stillwater NWR and the surrounding area. 2011 Lidar data and .5 meter resolution imagery became available in mid-summer; this was partially funded by the NWR. Stillwater has been on the Refuge I&M funding proposal list for the past several years. In addition the region has been contacted by the Fallon-Paiute-Shoshone Tribe to assist with development of wetlands data. They plan to apply for an EPA Wetlands Program Development Grant in 2012.

Stillwater geothermal field is located near the small community of Stillwater, Nevada, approximately 20 km east of Fallon and just south of the Stillwater National Wildlife Refuge. The community of Stillwater is near the center of a thermal groundwater anomaly covering 52-65 km².

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