GeoSpatial Services

• An Integration of Academic Apprenticeship and Professional Services (supports an M.S. of GIS program)

• Offices in Winona & Minneapolis, MN

• Focus in GIS & Wetlands:
  • Landscape-scale Wetland Mapping (NWI)
  • Functional Assessment
  • Wetlands in Watershed Planning/Decision-Support
Guiding Principles

Audience Awareness

1. Find Common Ground (literally and figuratively)
2. Use Local Knowledge
3. Show Respect for Knowledge and Profession
4. Beware of Jargon
5. Give A Voice, Check-in Often, Listen
6. Recognize the Their Challenges
Treat People Respectfully
Treat People Respectfully

Community of Practice

- Common Theme/Purpose (Joint Enterprise)
- Trust Among Members
- Share Tacit Knowledge
- Shared Practice
- Collective Intelligence
- Implicitly held Knowledge

Spontaneously come together under a
within each

which becomes
which creates

thereby developing

in order to

they build

GeoSpatial Services
Saint Mary's University of Minnesota

United States Department of Agriculture
Natural Resources Conservation Service
Beware of Jargon

Hungry Bacteria Magically Remove Nitrates

Water with dissolved nitrates flows into a wood chip pit. The wood chips serve as a home and food for bacteria in the low-oxygen environment. Bacteria convert nitrates into dinitrogen gas, and water flows from the output minus nitrates.
Beware of Jargon

“You know what we do with Potholes…”

Figure 2. Aerial view of glacially formed, depressional wetlands of the Prairie Pothole Region. Credit: J. Ringleman, Ducks Unlimited, OCP07-Fig37 PPR, www.usgcrp.gov
Give Everyone A Voice
Use Understandable Graphics
Project Example
What are Wetland Jewels?

• Comprised of either a single wetland or a complex of several wetlands occurring in a discrete geographic area.

• Provide several important ecological functions to the terrestrial and aquatic landscape as well as to downstream communities.

• A tool to build ecological and community resilience in the face of climate change.
Why Protect Wetland Jewels?

Wetland Jewels are a keystone element of action to foster resilient, interconnected, landscape-scale ecological and community systems.

- Maintain stream flow essential for irrigation and wildlife
- Create habitat for wildlife
- Provide clean water for downstream communities
- Mitigate the risk of flooding
- Reduce climate impacts – drought, earlier runoff, wildfire
Identifying Wetland Jewels

- First Step: setting the project area.
  - Carson and Santa Fe National Forests undergoing Forest Plan Revisions - only happens every 30 years.
  - Project area – lands within the two National Forests.

- Second Step: stakeholder engagement to determine priority ecological wetland functions.
Facilitated stakeholder engagement meetings and outreach:

- Discussions and educational materials used to ensure understanding
- A Dot-Voting approach was used to gain consensus
- Online Survey Monkey was shared over social media
- Results were tallied and presented for final consensus
Stakeholder Engagement

Final Priority Functions Included:

- Contributes to Streamflow
- Groundwater Recharge
- Fish and Aquatic Invertebrate Habitat
- Threatened and Endangered Species
- Surface Water Detention
- Waterfowl Habitat
- Beaver Habitat Headwater
- Restoration Potential
- Carbon Sequestration
- Headwater
Communication Tools

Carson National Forest Wetland Jewels

Take some time to click through the pages on the left (scroll down to see all 17 pages) and learn about the Wetland Jewels inside the Carson National Forest. Absorb the landscape through photos, explore the wetlands using interactive maps, and learn about why the Carson National Forest wetlands are a vital component to the surrounding ecosystems.

1 What are Wetland Jewels?

Wetland jewels can be comprised of either a single wetland or a complex of several wetlands occurring in a discrete geographic area of national forest lands. These wetlands provide several important ecological functions to the terrestrial and aquatic landscapes.

Due to their critically important ecological and community role, we have identified Wetland Jewels in the Carson National Forest to not only bring attention to their importance, but to secure their long-term protection and restoration.

Ultimately, Wetland jewels can be used as a tool to build ecological and community resilience in the face of climate change.

2 Why Protect Wetland Jewels?

3 New Mexico’s Completed Wetland Mapping

4 What are Priority Wetland Functions?

5 How Were Wetland Jewels Identified?

6 The Carson National Forest Wetland Jewels

7 Valle Vidal

GeoSpatialServices
Saint Mary’s University of Minnesota
Identifying New Mexico ‘Wetland Gems’

What? and Why?
Amigos Bravos and Western Environmental Law Center worked with GeoSpatial Services at Saint Mary’s University to identify important wetlands in the Carson National Forest. These important wetlands were called “Wetland Gems”, and were defined using recently mapped wetland data. A process to identify and map Wetland Gems on the Santa Fe National Forest is now underway. Wetland Gems are intended to inform local, state, and federal land and water planning efforts.

NWI+ data (Enhanced Wetland Data)
Many wetlands in New Mexico have been mapped using contemporary aerial photography and other GIS data. Along with National Wetland Inventory (NWI) vegetation and water persistence codes, additional descriptive information was used to enhance the wetland information. This data is referred to as NWI+ data. Additional information included each wetland’s landscape position (e.g., river, stream, terrace), landform (basin, sloped, fringe), and surface water flow-path (e.g., throughflow, outflow).

Which Wetlands are Gem Wetlands?
Wetland data is queried to identify:
1) specific wetlands types
2) wetlands predicted to be significant for specific functions
3) wetlands meeting certain locational criteria.

Examples of wetland data queries
- Basin or saturated slope wetlands;
- Headwater wetlands;
- Headwater wetlands with discharge to stream;
- Spring-fed wetlands;
- Headwater wetlands that are connected to known cold water fish bearing streams;
- Wetlands that are connected to streams that are listed as impaired;
- Wetlands that perform surface water detention and/or streamflow maintenance;
- Wetlands (complexes) that are considered to be important for general wildlife habitat.

Wetland Gems are those wetlands that meet multiple criteria.

[Images and logos of Saint Mary’s University, Western Environmental Law Center, and AMIGOS BRAVOS]
Restoration/Stakeholder Engagement

• The Wetland Jewels Project has provided a good framework for obtaining restoration funding.
• Numerous volunteer restoration projects have already occurred.
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