



NEVADA
DIVISION OF
NATURAL HERITAGE



Nevada Wetland Program Development - Inventory, Mapping and Data Management Tools, and Partner Engagement

*Kristin Szabo, Administrator
Nevada Division of Natural Heritage
November 18, 2020*

EPA Region 9 Wetland Program Development Grant 2020 Virtual Conference



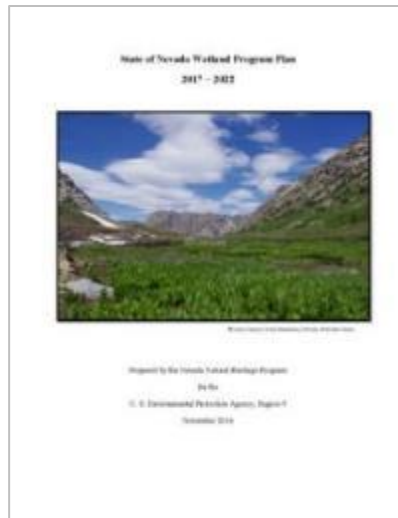
Kristin Szabo
Administrator

Nevada Wetland Program Development

- Collaborative Project



- Nevada Wetland Program Plan 2017-2022



- Core Elements

- Monitoring and Assessment
- Voluntary Restoration and Protection
- Sustainable Financing

<http://heritage.nv.gov/wetlands>

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Director



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Administrator

Nevada Wetland Program Development

- **Tasks**
 1. Compile existing data and collect new data on Nevada springs and springs- and wetland-dependent species (NDNH, SSI, TNC)
 2. Improve Springs Online and springs-dependent species documentation (SSI)
 3. Conduct outreach through a symposium, webinars, and on-the-ground training (SSI)
 4. Increase functionality and analysis tools within the WetBar Level 1 wetland analysis toolbar (DRI)



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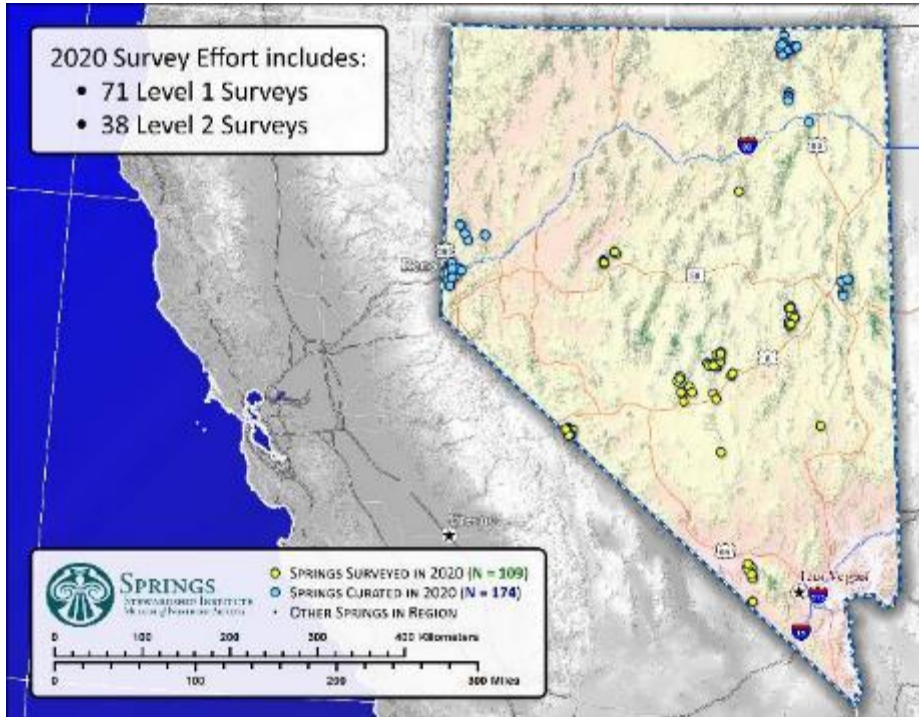


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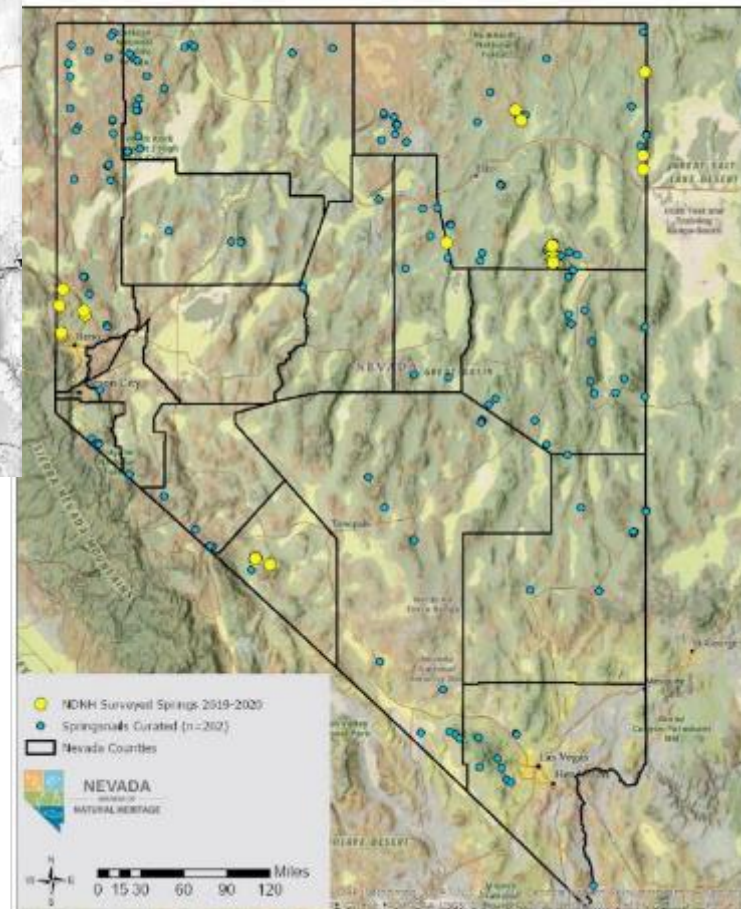


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Nevada Division of Natural Heritage, 68 springs surveyed: Nov 2019-Nov 2020



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Nevada Wetland Program Development

- **Partner Engagement**
 - 2020 and 2021 Nevada Water Resources Association Conferences (<https://www.nvwra.org>)
 - ‘Nevada Wetlands Collaborative’ Google Group
 - Nevada Division of Natural Heritage website (heritage.nv.gov/wetlands)
 - Nevada/Utah Springsnail Conservation Team





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Nevada Wetland Program Development

- Springs Stewardship Institute
 - Springs Online, Jeff Jenness, GIS Analyst

Springs Online

<http://springsdata.org/>

SPRINGS ONLINE
SPRINGS STEWARDSHIP INSTITUTE of the MUSEUM of NORTHERN ARIZONA

Home Search Springs Management Menu Reports User Permissions Taxonomy Citation Welcome Jeff [logged in]

Springs Online: The Springs and Springs-Dependent Species Database

The collaborative database is developed and maintained by Jeff Ledbetter, Jeff Stewer, and the Board of the Springs Stewardship Institute (SSI), an initiative of the non-profit Museum of Northern Arizona in Flagstaff. Toward the goal of improving the global health of springs, SSI has created public links to inventory and assess the ecological health and functioning of these fragile, biologically rich, and highly threatened ecosystems. Springs data are complex, with many interrelated ecosystem characteristics and processes. This requires a flexible, extensible, and freely relational framework into which information was or compiled, archived, analyzed, and reported upon. Access to data requires an account and permission of the springs owner or manager, although published information is available to all users.

Springs Online is a hard-earned program that is continually being improved, and is freely available for non-commercial research, conservation, and planning purposes. Contact SSI (springsdata@mnsnaz.org) about consulting or other commercial uses of Springs Online.

Click here to view the tutorial for using the site.

Click here to learn more about SSI.

Presently used by nearly 1,000 organizations, agencies, and researchers, funding for development of Springs Online was provided by the Sky Island Alliance, the Bureau of Reclamation's Watersheds program, the US Forest Service, and the Bureau of Land Management. Your tax-deductible donation will help support the cost of improving additional data, testing, and improving Springs Online.

Support Springs Online with a tax-deductible contribution.

SSI - Other Sites:
A-21-87 PARK, FLAG, 0482 2033581133
SSI's features:

Springs Stewardship Institute Flagstaff, Arizona
contact Jeff Ledbetter at jeff@springstewardship.org

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Defining Sub-units with Nevada Priority Wetlands and Integrating Species Data into Level 1 Analyses

Task IV of CD-99T93201-0

Kenneth McGwire
Associate Research Professor

Desert Research Institute
Reno, Nevada

11/18/2020

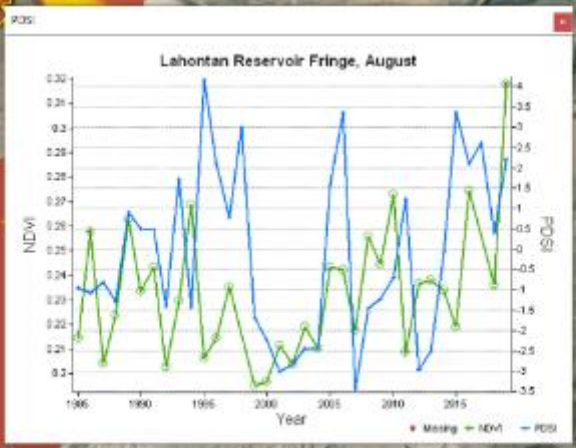
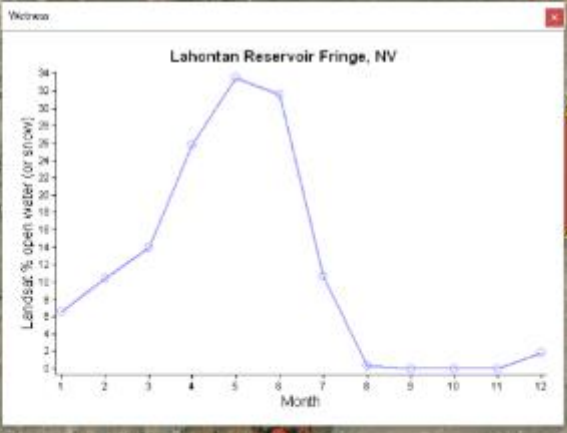
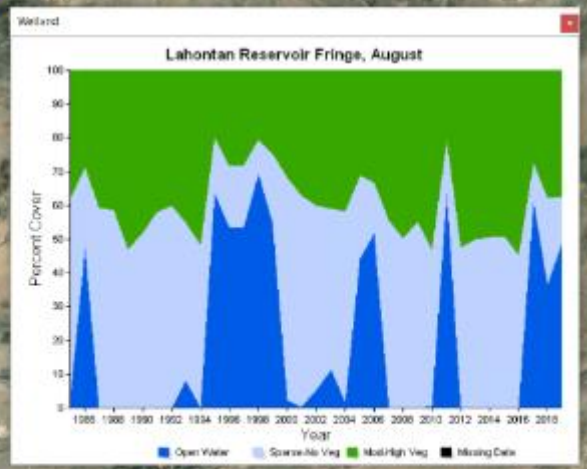
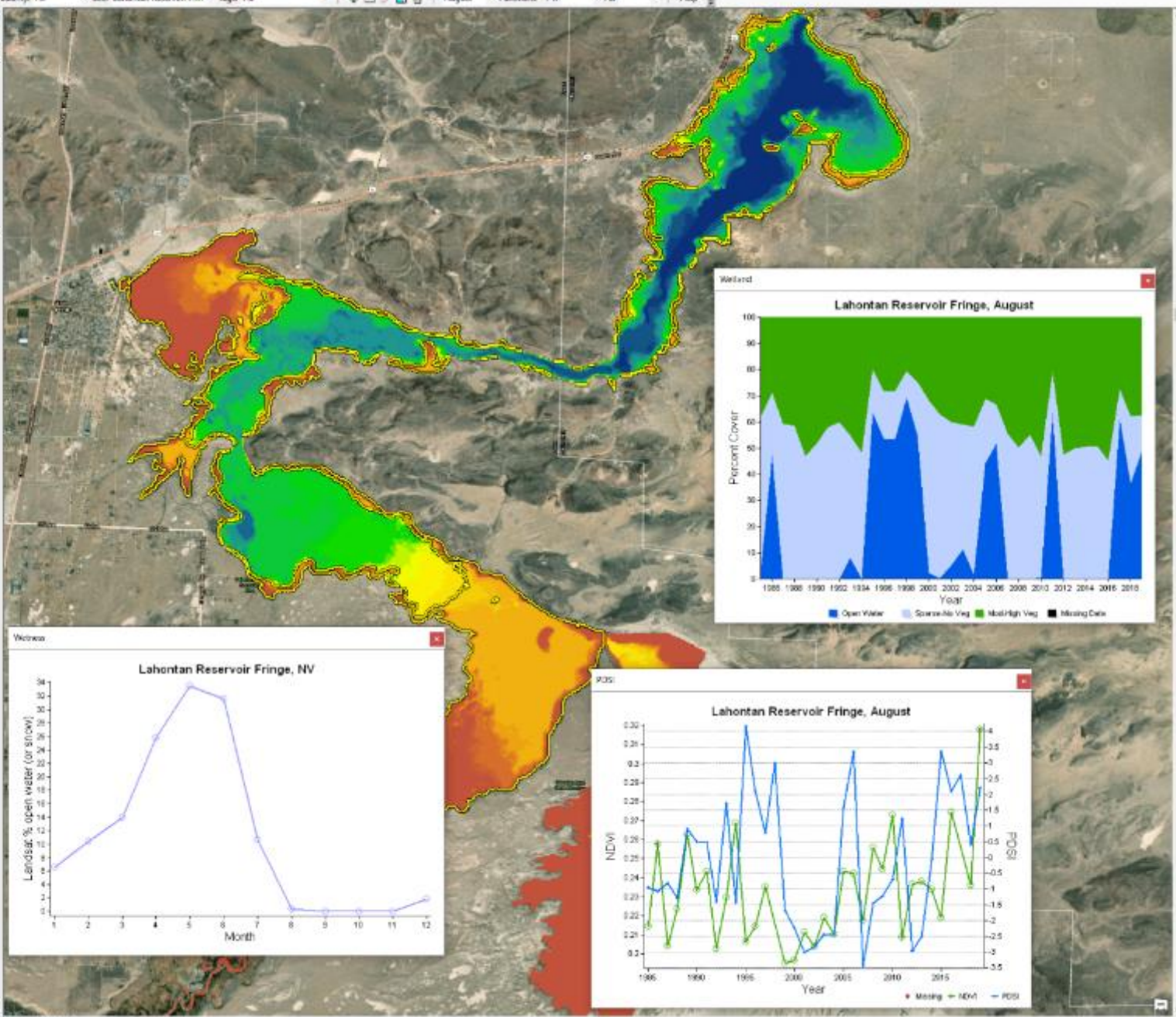


The Level 1 Wetland Analysis Toolbar (WetBar)

- An analysis tool for investigating trends and drought sensitivity of vegetation and hydrology in wetland environments of Nevada
- Integrates Landsat, Sentinel-2, and climate data from Earth Engine directly into ArcMap Desktop (not ArcMap Pro yet)
- Automated calculation and organization of satellite time series data for user-defined sites
- Sites can be tagged with multiple attributes (e.g. ownership, wetland type), grouped, and sorted based on trend statistics

Table Of Contents

- Layers
 - D:\Users\Documents\ArcGIS
 - RT1_srf
 - RT1_floodedmp
 - RT1_sbfNDVI
 - RT1_sbfNDVI
 - D:\Projects\WebBar\Datasets
 - Years Flooded
 - Value
 - High: 30
 - Low: 1
 - D:\Projects\WebBar\WebBar
 - siteReports
 - Boundaries and Places
 - Transportation
 - Imagery



Nevada Priority Wetlands Inventory 2007

Addendum to Nevada's 2003 Statewide Comprehensive Outdoor Recreation Plan



Task IV-A: Mapping
localized variability
within complex wetland
units

NPWI has 234 wetland sites

Widely varying scales

Developing approaches to
disaggregate large complex
units

Prepared For



Prepared By



In Cooperation With





148.5 KM

Site Name: 161 Schell Creek Range - stream riparian (Riparian Marsh)
 Ownership: Steptoe Valley Wildlife Management Area, NDOW; BLM; Humboldt National Forest, FS; High Schells Wilderness, FS; 3 others

County: Lincoln; White Pine
 Location: -114.64022; 39.407473 Lon/Lat WGS-84
 703165; 4364560 UTM Zone 11 NAD83
 Area: 10892.27 acres
 Perimeter: 802.55 miles
 Updated: 2020-04-10

HUC10: 1606000903; 1606000902; 1606000901; 1606000818; 1606000817; 13 others
 S.E. Area: Steptoe Valley; Cave Valley; Lake Valley; Spring Valley

Environmental Conditions	Average	Range
Elevation (m):	2261.0	1790 to 3180
Slope (%):	24.3	0 to 154
Dominant aspect(s):	Mixed	
Annual precipitation (mm)	751	
Monthly precipitation (mm):	32	11 to 97
Monthly Minimum temperature (C):	0	-13 to 14
Monthly Mean temperature (C):	6	-8 to 21
Monthly Maximum temperature (C):	13	-3 to 32

Number of known springs: 570

Soils: Devilsgait-Duffer-Kunzler association (6.0%);
 Devilsgait-Cassiro association (7.3%);
 Tulase-Pern association (1.9%); Amelar-Bobs association (1.7%);
 additional small components (20.7%); missing data (61.1%)

Wetland classes: Palustrine shoreline (0.2%); Palustrine emergent (11.2%);
 Palustrine flooded (0.1%); Palustrine shrub (13.1%);
 Palustrine meadow (4.8%); Palustrine forest (0.3%);
 Littoral emergent (0.1%); Riparian (70.2%)

NWI classes: PEM1/SS1C; R4SBCx; R4SBax; PSS1Ch; L2UBFh; L1UBHh;
 R4SBJ; R4SBC; R4SBA; R3UBF; PUSCh; PUSAx; PUSAh; PUBHx;
 PUBHh; PUBFx; PSS1J; PSS1D; PSS1C; PSS1B; PSS1A; PFO2A; 15 others

Tags: NV Wildlife Management Area; National Wilderness Area;
 Humboldt National Forest; NPW2007 Draft 1; Palustrine;
 Riparian; Littoral; Springs; NDOW; Lake; BLM; FS

Classifying Riparian Dynamics from NDVI

Classify Reaches from DEM

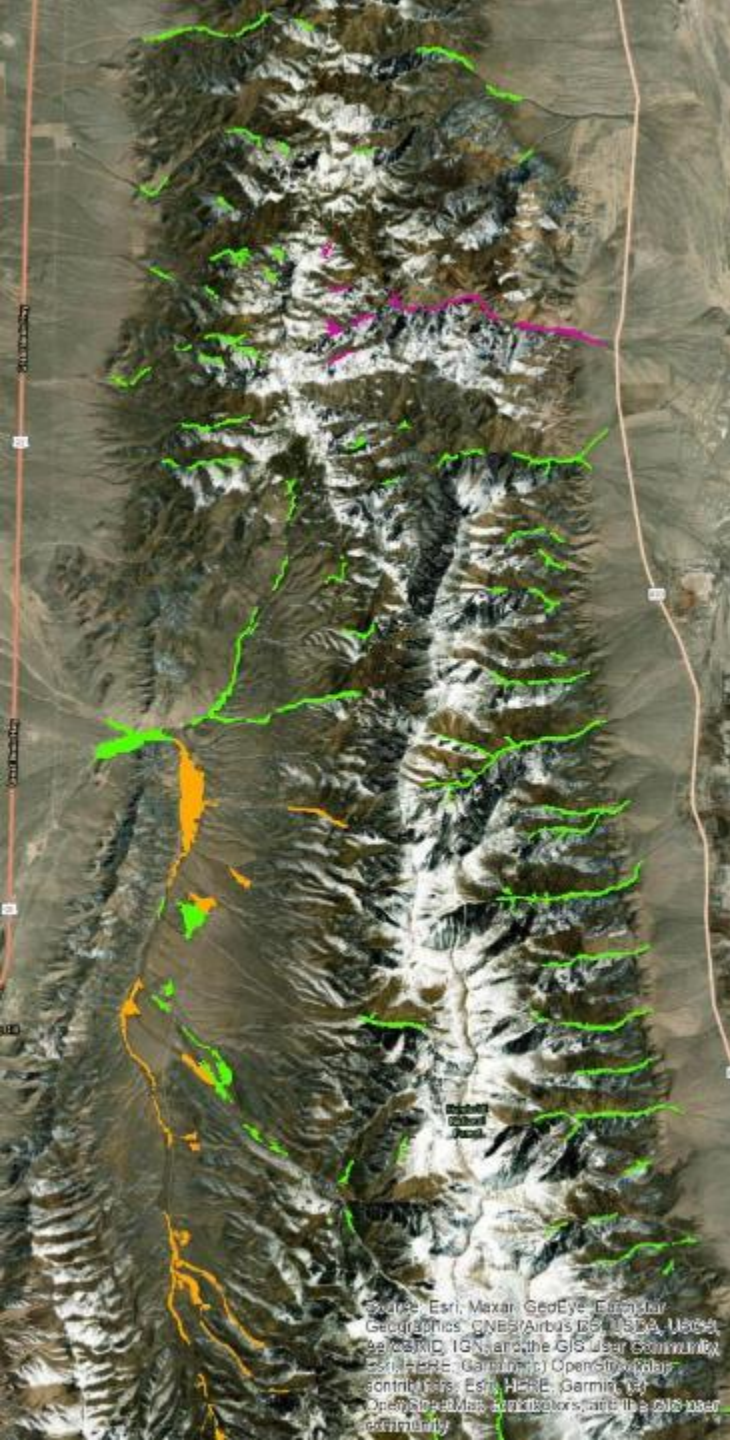
Principal Components Analysis

- Amount
- Interannual variability
- Trends

Isodata Clustering

- Different regimes by reach
- Compare based on proportions of Isodata classes by reach





Classifying Riparian Dynamics from NDVI

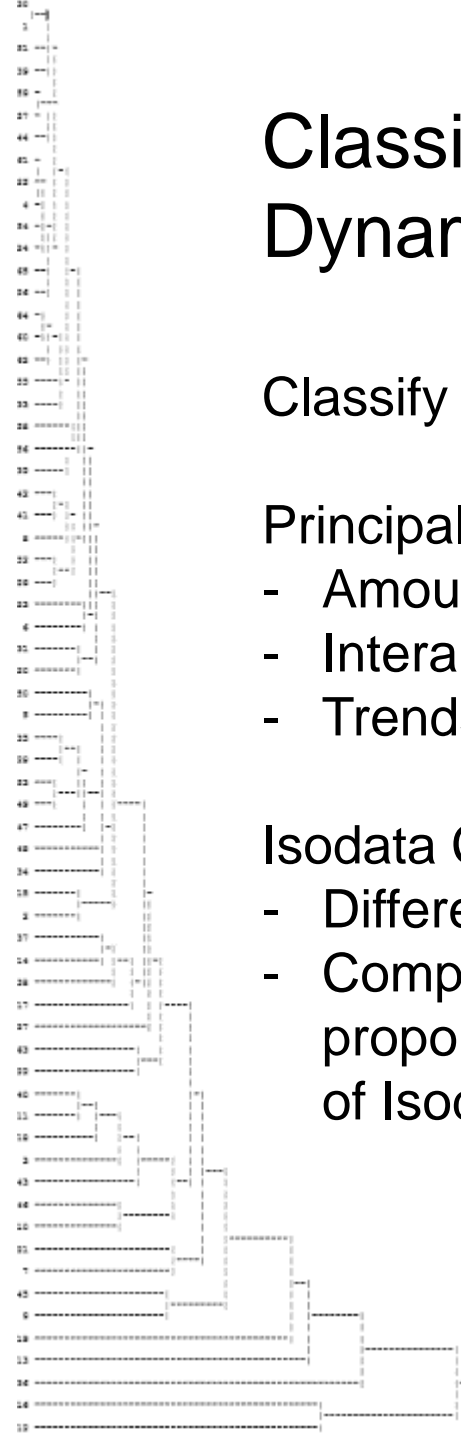
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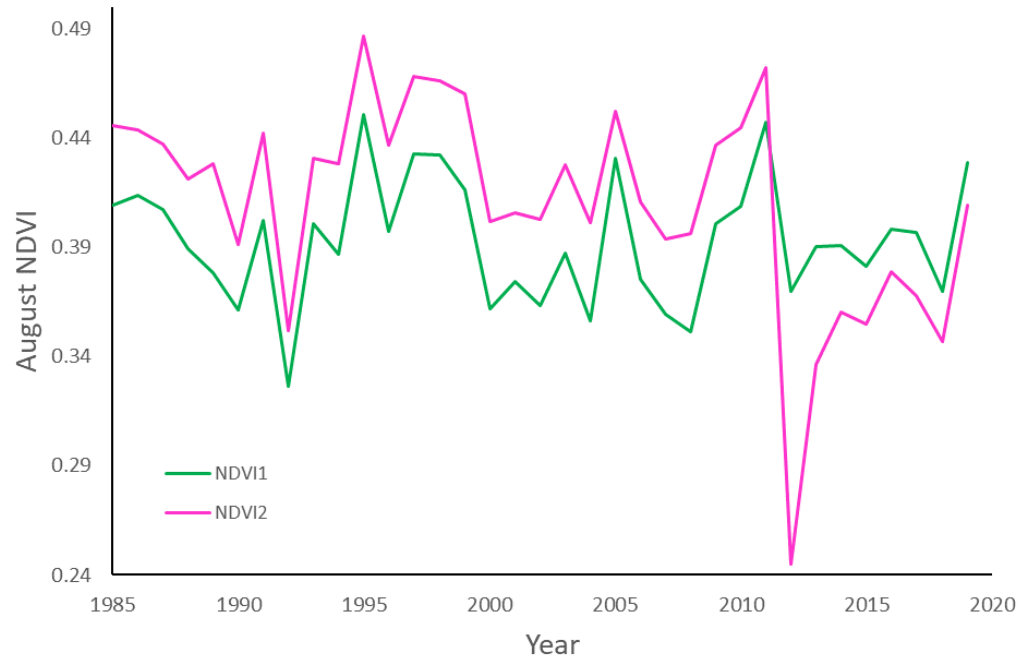
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Classifying Riparian Dynamics from NDVI



Source: Esri, Maxar, GeoEye, Earthstar
Geographics, CNES/Airbus DS, USDA, USGS,
Swire, IGN, and the GIS User Community
Contributors: Esri, HERE, Garmin, (c)
OpenStreetMap contributors, and the GIS User
Community

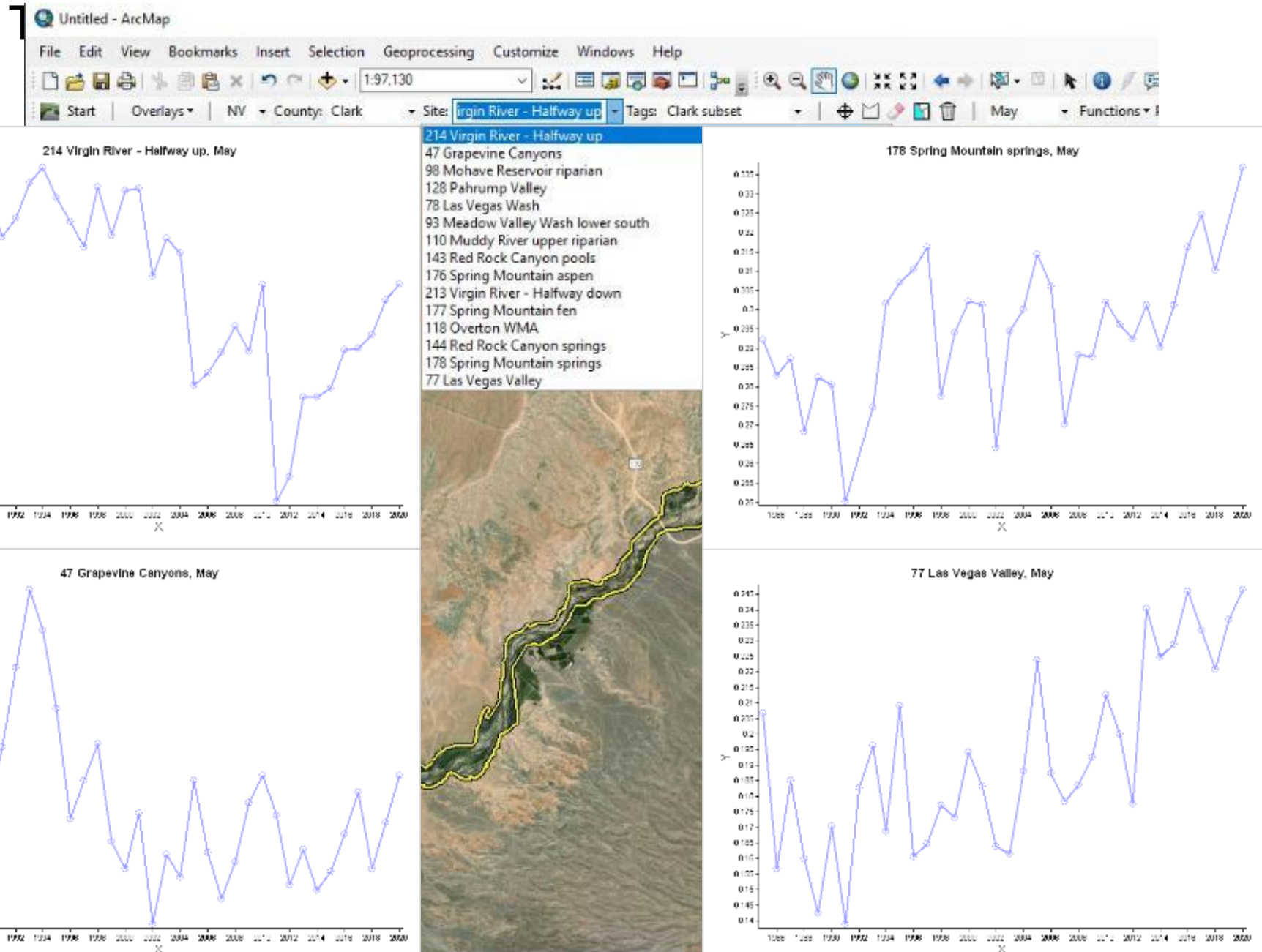
Classifying Riparian Dynamics from NDVI



Source: Carl Minter, Google, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community, Earth, HERE, Garmin, (c) OpenStreetMap contributors, Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community



Task IV-B: Statewide Classification and Prioritization



Task IV-C: Integrating Species Data

Task IV-D: Stakeholder Engagement

Online presentations

- TNC
- BLM
- NWRA
- Utah DCNR

Site visits

- USFWS

New application of WetBar

- Lahontan cutthroat trout recovery



Lahontan cutthroat trout from Currant Creek, a tributary of Marys River in northeastern Nevada. Photo courtesy of Nevada Department of Wildlife.



Healthy riparian habitat in northeastern Nevada. USFWS photo.

Lahontan Cutthroat Trout Interagency Recovery Partners

Collaborative research with Utah
DCNR

WetBar

- Trends in riparian vegetation
- Stream/floodplain connection



Kristin Szabo
Administrator

Thank You

Contact:

Kristin Szabo Administrator
Nevada Division of Natural Heritage
775-684-2901 | kszabo@heritage.nv.gov
heritage.nv.gov

Jeff Jenness, GIS Analyst
Springs Stewardship Institute
jeff@springstewardship.org
springstewardshipinstitute.org

Ken McGwire, Associate Research Professor
Desert Research Institute
kenm@dri.edu
www.dri.edu



Bradley Crowell
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