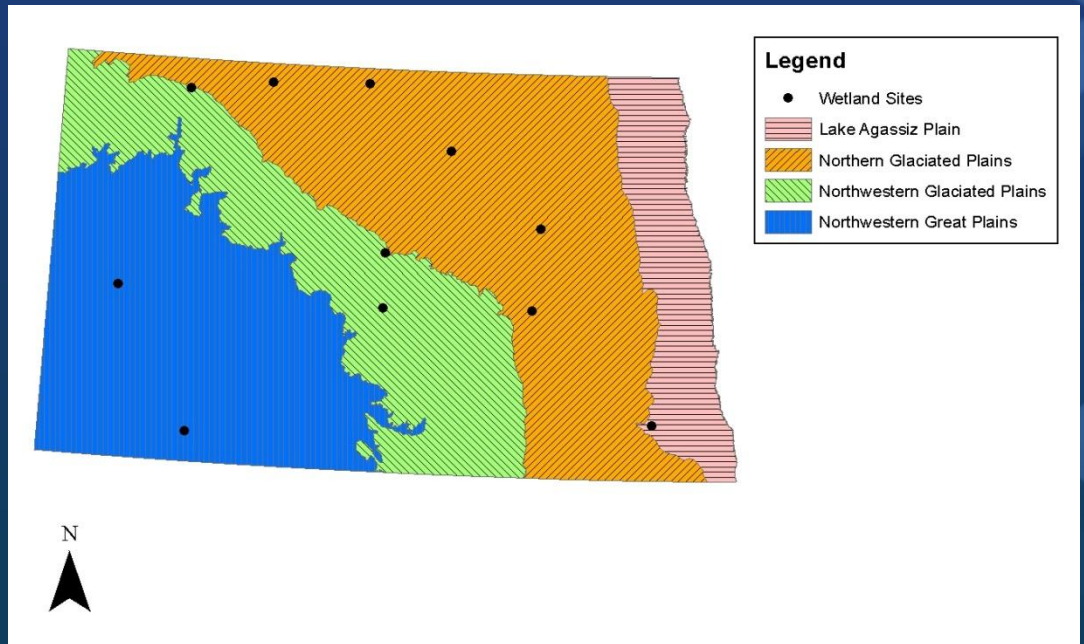
# The North Dakota Intensification of the NWCA: An Endeavor in Collaboration

Christina Hargiss, Shawn DeKeyser, Jack Norland, Tom DeSutter, Lindsey Meyers, Mike Ell

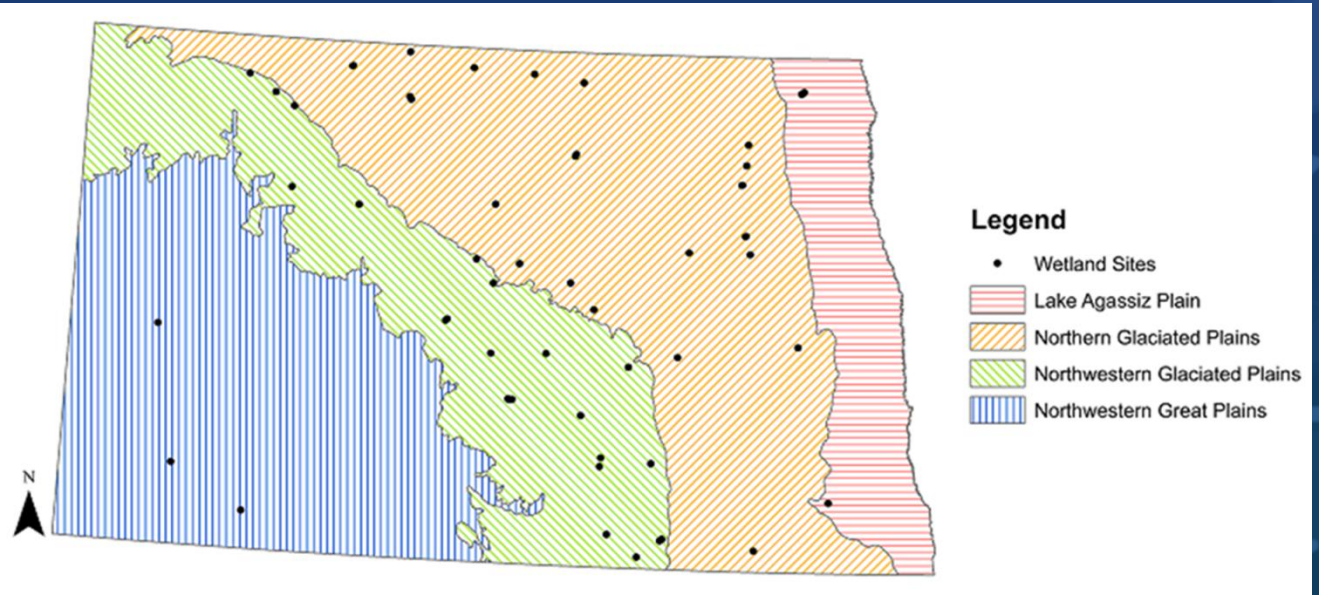
# NWCA in North Dakota

- 11 Wetlands
- 2 revisits
- All NWCA methods completed



# ND Intensification

- Additional 42 wetlands
  - Regional methods on 2 ND reference sites
  - 55 wetlands total with NWCA sites
- NWCA methods
- Region specific methods
- Additional research



# Collaboration

- North Dakota Team Development
  - Botanist
  - Soil Scientist
  - Water quality specialist
  - Statistical and modeling expertise
  - Organizer

# Obtaining Permission

- Summer/Fall 2010
- Contacted 111 landowners/managers
  - 64 yes responses
  - 34 no responses
  - 13 through repeated contact received no response
  - Hard to get yes response in "oil country"

# Collaboration

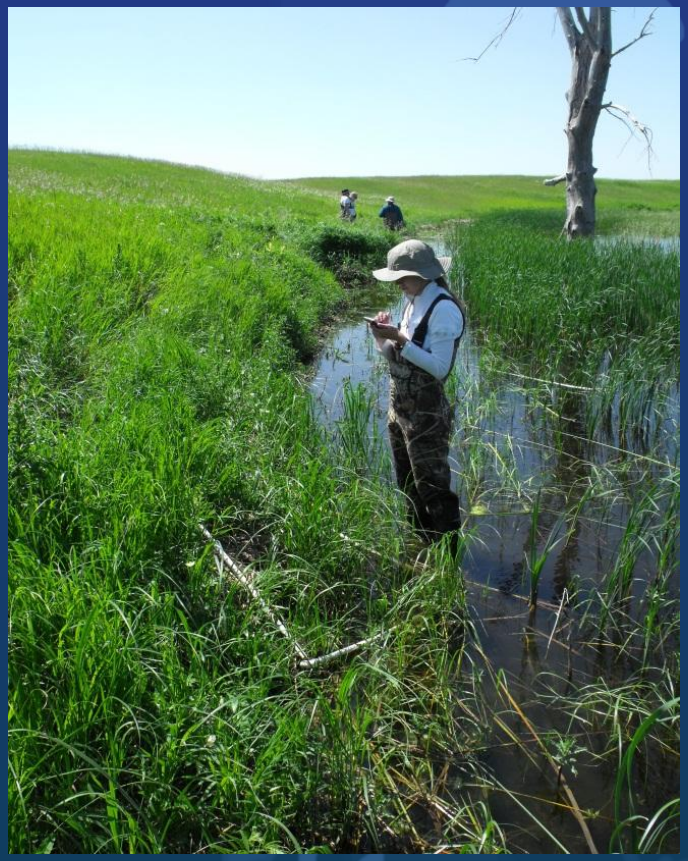
- Two field teams assessed all wetlands
  - Average of 7 people each team (rotating)
- Each team consisted of
  - Botanist
  - Soil scientists
    - NRCS and NDSU
  - Water quality
  - Regional methods
  - Graduate projects
  - Multi-purpose workers

# Data taken at each site:

- NWCA Methods
  - Vegetation
  - Soils
  - Hydrology
  - Water quality
  - Algae
  - USRAM
  - Buffer
- Additional Information
  - Site description
  - Pictures
  - GPS
- Regional Methods
  - IPCI
  - HGM
  - NDRAM
- Additional research
  - Soil
  - Plants
  - Pesticides

# Index of Plant Community Integrity (IPCI): a form of IBI

- Developed on temporary, seasonal and semi-permanent wetlands within ND, SD, and MT (DeKeyser et al. 2003, Hargiss et al. 2008)
- Evaluates health of Prairie Pothole Region wetlands based on plant community
- Uses multi-metric system to evaluate condition
- Final scores on a scale of 0-99
- Groups wetlands based on final score



# North Dakota Rapid Assessment Model (NDRAM)

- Rapidly assesses wetlands based on plant and landscape characteristics
- Approximately 20 minutes to conduct survey
- Uses 3 metric system
- Final scores on a scale of 0-100
- Groups wetlands based on final score
- Results intended to be similar to the IPCI

# Hydrogeomorphic (HGM) Model

- Assesses the physical attributes and functional characteristics of each wetland
  - Synthesized physical characteristics, land-use information, biological data, soil data, and GPS and GIS information
  - Calculated six Functional Capacity Indices (FCI) for each wetland

  (Gilbert et al. 2006)

# Additional Research and Analysis

- NDSU Research Interests
  - Regionally developed methods versus national methods
  - Statewide assessment method (tool)
  - Many wetland chosen were not "typical" ND wetlands
    - Forest
    - Part of larger lake ecosystem
    - Part of riverine ecosystem
  - Regional methods were not created for these ecosystems
    - Able to test portions of methods that may apply on a statewide scale

# Statewide Methods Assessment

- Determine metrics most useful to assess wetlands statewide
  - Nonmetric multidimensional scaling (NMS)
  - Pearson correlation coefficient
- HGM and NDRAM
  - Found metrics related to buffer width and plant community had strongest correlations
- IPCI – Plant based assessment
    - Introduced, annual, and biennial species
    - Richness of native perennials

# Additional Research and Analysis

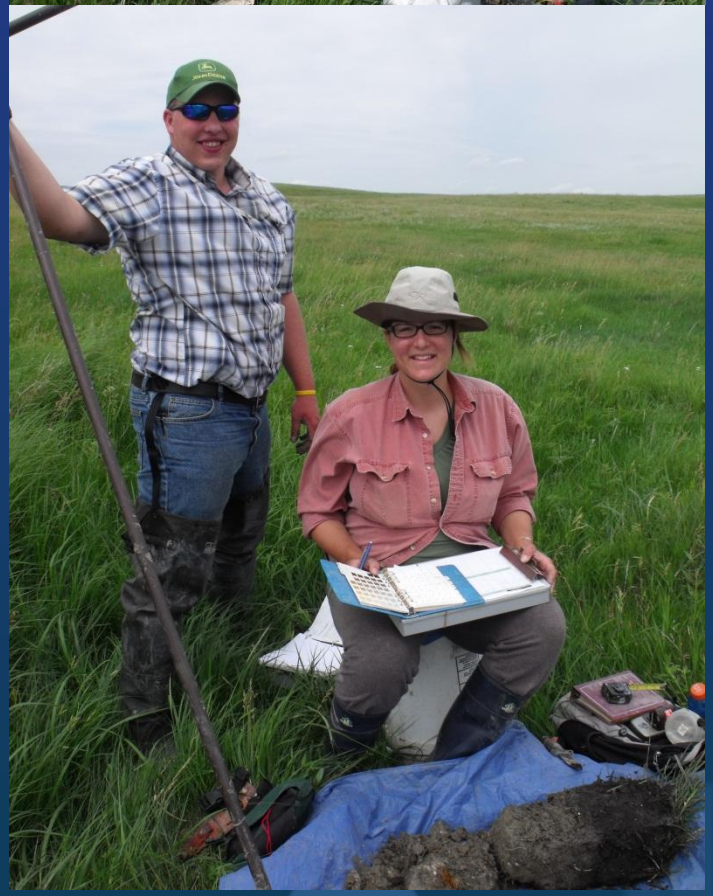
- NDSU Research Interests
  - Mercury sampling
  - Ecosystem services and Nutrient Cycling
    - Landscape Position
    - Plants – Phosphorus, Nitrogen, and Carbon
    - Soil – Phosphorus, $N_{15}$ isotopes
  - Soil multi-elemental fingerprinting
- ND Department of Agriculture
  - Pesticide sampling

# Collaboration

- In North Dakota 40+ people helped in the field
  - More in lab
  - Nationally?
- North Dakota State University
  - Lead the effort
  - 4 different departments/programs
  - 20 faculty, staff, and students
    - 3 masters and 2 Ph.D. projects from data
- North Dakota Department of Health
  - 6 people in field + lab personnel
    - Water quality/chemistry sampling
    - Algae samples

# Collaboration

- Natural Resource Conservation Service
  - Described wetland soils at every site visited
  - Senior personnel trained junior personnel
  - Reviewed, tested, and validated hydric soil indicators for our region
  - 13 people in field
- EPA Western Ecology Division
  - $N_{15}$ research – nitrogen cycling
  - Ecosystem services
- North Dakota Department of Agriculture – Water Quality Advisory Committee
  - Pesticide sampling
  - 1 person



# What is going on now?

- Learned a lot about organization
  - Key to our success!
- We still have a long road ahead
  - Lots of data
  - A lot of analysis
  - Results in the next year+

# Thanks!

EPA Region 8
EPA Office of Water
EPA Western Ecology Division
ND Dept. of Health
ND Dept. of Ag
NRCS

Amanda Nahlik
Larry Swenson
Mike Scozzafava
Jessica Johnson
Kevin Horsager
Eva Sebesta
Karl Hermann
Gregg Serenbetz
Marinus Otte
Alex Yellick

Matt Stasica
Skye Gabel
Christina Hargiss
Mike Ell
Grant Neuharth
Paul Olson
Levi Sheff
Patrick Corrigan
Wade Shaver
Brandon Montgomery
Kristen Newman
Keith Jacobson
Mike Hargiss
Pete Wax
Natalie Allen
Donna Jacob

Alan Gulsvig
Lance Duey
Brandon DeFoe
Perry Sullivan
Kristin Brennan
Kyle Thomson
David Zimmerman
Jerome Schaar
Michael Ulmer
Dennis Whitted
Shawn DeKeyser
Jessica Meissner
Jack Norland
Tom DeSutter
Jeanne Heilig
John Kempenich


Questions?