

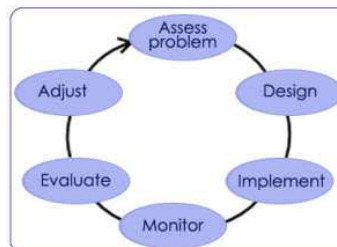
Professional Stewards Hike 2016 Kick-off: How can student research more effectively meet practitioners' needs?

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College Conservation Collaborative

- Practitioners have **site-specific research and monitoring needs** for *adaptive management*
- BUT limited time and funding to do it



College Conservation Collaborative

- Students regularly collect data as part of educational goals of their courses or degrees



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- Practitioners have **site-specific research and monitoring needs** for *adaptive management*, BUT limited time and funding to do it
- Students regularly collect data as part of educational goals of their courses or degrees
- Let's collaborate!
- CCC started in 2014 by Jacqueline Courteau
- Led to **Professional Stewards Hikes** – learn from each other and discuss potential collaboration in a field setting

College Conservation Collaborative

What did we do and what have we learned?

- Met with practitioners to determine needs
- Several course labs and/or projects directed to meet general or specific needs
 - Field research
 - Restoration management plans
 - Could add: Lit reviews, Stats analysis!

Examples

- NRE 509 Ecology labs and student projects (over 80)

Ref #	Area	Site	Jurisdiction	Title
1423	Edge effect	Scio Woods	NAPP	Roads and the Edge Effect in Scio Woods Preserve, a hardwood forest in SE Michigan
1512	Edge effect	Arboretum	UM	The effect of forest edge (shading) on the structure of the Nichols Arboretum Prairie
1412	Fire	Arboretum	UM	Does The Early Burn Get The Worm?: Earthworm densities in various burn regimes of the Dow Prairie
1424	Fire	Arboretum	UM	Plants, Worms and Burns in Furstenburg Nature Area
1528	Fire	Black Pond Woods	AAP	The effect of prescribed burns on earthworm and soil biota richness and abundance in Black Pond Woods Nature Area
1521	Fire	Black Pond Woods	AAP	Is controlled burning an effective method to manage invasive species at Black Wood Pond Nature Area in Ann Arbor?
1411	Fire	Arboretum	UM	To Burn or Not To Burn? Burn Frequency Influences on Plant Biodiversity in Nichols Arboretum
1508	Fire	Furstenburg	AAP	Playing with Fire: The effect of prescribed burns on plant composition and abundance in oak savannas in Furstenburg Park
1421	Fire	Arboretum	UM	The impact of Prescribed Burns on Soil Quality and Vegetation in Midwestern Prairies of Nichols Arboretum
1404	Forest composition	North Campus woods	UM	Forest succession: Canopy vs. understory tree composition in forests of different age in Scio Woods Preserve and North Campus woods

Examples

- **Restoration Ecology labs & management plans**
 - Arb, Dow Prairie: Effect of growing vs. dormant season burns on forb abundance
 - Campus Farm: Insect diversity and crop bed size
 - Parker Mill: Forest invasive shrubs in areas with different management
 - Arb, Huron River landing, shrub species composition, abundance along restored riverbank
- Senna Prairie Farm
 - Integrating ecological and agricultural restoration on 40-acre farm
- Campus Gardens
 - Plan for native plant and pollinator gardens

Challenge 1: Finding & framing the questions that meet Research, Education, & Practice Needs

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Solutions:

- Practitioners provide site-specific questions
- Adjust for feasibility

- How does the frequency of prescribed burning relate to forb vs. grass cover or the number of earthworms?
- Is soil compaction less under mulched vs. un-mulched trails in the Arboretum?
- How does forest age (from 1940s aerial maps) relate to amount of carbon storage in North Campus Woods?
- How does forest composition relate to proximity to the old road cut in Scio Woods?

Challenge 2: Student Data Quality Varies

- Ph.D. Dissertation
- M.S. Thesis
- M.S. Project
- Undergraduate Research Project (UROP)
- **Advanced Course Lab or Independent Project**
- **Beginning Course Lab (repeated)**
- **Beginning Course Independent Project**

Challenge 2: Student Data Quality Varies

Solutions:

- Adjust question for level of students
- Submit M.S. project ideas
- Recruit more advanced courses to participate (Soil ecology, Forest ecology, Statistics)
- Ask the same question every year (~Citizen Science)

Challenge 3: Access to adequate baseline data or site background

- E.g. Burn history maps – which are the best sites to compare?
- E.g. Invasive species management history – what has happened here previously that might affect current density?

Solutions:

- Share management history in key topics
- Start baseline data
- Establish deer exclosures
- Permanent Forest Plots

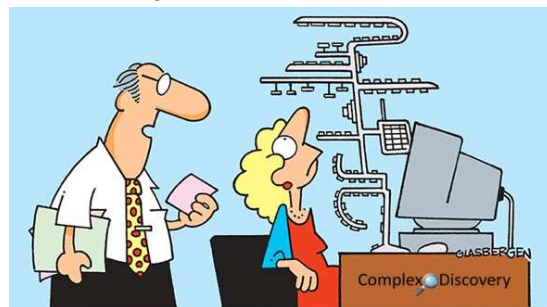
Challenge 4: Sharing data

- Across courses, sites, institutions!
- Close the adaptive management loop
- Need for a centralized system to *contribute to and draw from*
 - *Did try SEAD and pdf on TSN site*

Solutions:

- Develop a sharing system that works and...

...is easy!



"It's an ergonomic keyboard. Once you learn how to use it, it will increase your speed by six percent!"

OR... just share some KEY data

- What 3-5 measures could we collect across University, NAPP, NAPP, and even private land to allow for comparative and long-term study of our natural areas?

Natural Area Quality Index (NAQI) idea presented at TSN conference

Where and when to restore?

Developing a practical rapid assessment method to prioritize areas for ecological management



January 16, 2016
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Land Conservancy of West Michigan
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Assessment Methods

- Floristic Quality Assessment (FQA)
- Michigan Rapid Assessment Method for Wetlands (MIRAM)
- TNC course-level metrics for fens and oak barrens/sand prairies
- HRWC Bioreserve Rapid Assessment Method
- HCMA Prioritization Tool



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Natural Areas Quality Index (NAQI)

Exotic Species % Cover	Value	Score	Weight
76-100		1	0.5
51-75		2	
26-50		3	
6-25		4	
0-5		5	

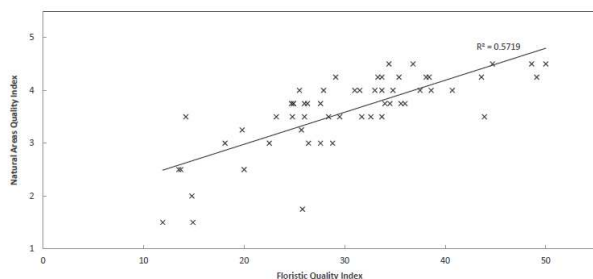
Plant Species Richness	Value	Score	Weight
0-25		1	0.25
26-50		2	
51-75		3	
76-100		4	
>100		5	

Number of Strata (>5% cover)	Strata	Weight
Total Present:	Submergent	0.25
	Emergent	
	Herbaceous	
	Shrub	
	Tree	

- Sum of weighted scores = NAQI value
- Values range from 1 to 5

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NAQI may be just as informative as FQI



Which 3-5 measures

could we collect across University, NAPP, NAPP, and even private land to allow for comparative and long-term study of our natural areas?

- % cover exotic species
- Plant species richness
- Number of strata (vegetation layers)
- ?...