MID-ATLANTIC REGION
FLORISTIC QUALITY
ASSESSMENT PROJECT

Riparia at
Penn State

mid-atlantic wetland workgroup
Regional Floristic Quality Assessment Project Objectives

- Assign coefficients to 4 main ecoregions in the Mid-Atlantic
  - Create regional plant list by ecoregion
  - Assemble botanical panel
- State involvement through MAWWG
  - Identify potential botanists
  - Identify existing sources of information
- User-friendly database with FQAI calculator (www.mawwg.psu.edu)
Assigning C Values

- USDA PLANTS database for initial list
- 13 botanists from 4 Mid-Atlantic states
- Meeting in Davis, WV November 13-16, 2009
- Follow-up via email
4 Main Ecoregions

- GP
- AP
- RV
- PD

- Appalachian Plateaus - Glaciated
- Appalachian Plateaus - Non-Glaciated
- Valley and Ridge
- Piedmont
- Coastal Plain
Project Overview

- Identified 4208 unique taxa
- Assigned C Values to 2822
- 1386 non-native
- Assigned by ecoregion
  - Most given single value across region
  - More than one value to account for ecoregional differences
- Did not assign C values to most hybrid taxa – only those that behave like true taxa
Chenopodium berlandieri

Conyza canadensis

Erigeron annuus

Oxalis corniculata

C Value = 0
Carex intumescens

Asclepias incarnata

Botrychium virginianum

Arisaema triphyllum

C Value = 5
Goodyera repens
Mitella nuda
Solidago simplex
Agalinis paupercula
Thuja occidentalis
Ammophila breviligulata

C Value = 10
Distribution of primary growth habit for MAR

Number of plant taxa

Primary Growth Habit

Forb/herb: 2390
Graminoid: 829
Shrub: 463
Tree: 352
Vine: 174
Distribution of plant taxa based on growth habit and nativity

**Growth habit**
- Forb/herb
- Graminoid
- Shrub
- Tree
- Vine

**Number of plant taxa**
- Native
- Non-native

<table>
<thead>
<tr>
<th>Growth habit</th>
<th>Native</th>
<th>Non-native</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forb/herb</td>
<td>1534</td>
<td>856</td>
</tr>
<tr>
<td>Graminoid</td>
<td>644</td>
<td>185</td>
</tr>
<tr>
<td>Shrub</td>
<td>303</td>
<td>160</td>
</tr>
<tr>
<td>Tree</td>
<td>247</td>
<td>105</td>
</tr>
<tr>
<td>Vine</td>
<td>94</td>
<td>80</td>
</tr>
</tbody>
</table>
Distribution of Coefficient of Conservatism (C) Values

- 0 to 1 plant taxa: 14%
- 2 plant taxa: 123
- 3 plant taxa: 135
- 4 plant taxa: 225
- 5 plant taxa: 317
- 6 plant taxa: 341
- 7 plant taxa: 420
- 8 plant taxa: 435
- 9 plant taxa: 295
- 10 plant taxa: 406

Number of plant taxa vs. Coefficient of conservatism (C) value
Percent of flora in each coefficient category

<table>
<thead>
<tr>
<th>condition category</th>
<th>0-3</th>
<th>4-6</th>
<th>7-8</th>
<th>9-10</th>
</tr>
</thead>
<tbody>
<tr>
<td>low</td>
<td>32</td>
<td>47</td>
<td>18</td>
<td>3</td>
</tr>
<tr>
<td>mod</td>
<td>27</td>
<td>48</td>
<td>20</td>
<td>5</td>
</tr>
<tr>
<td>high</td>
<td>22</td>
<td>46</td>
<td>23</td>
<td>9</td>
</tr>
<tr>
<td>highest</td>
<td>18</td>
<td>45</td>
<td>25</td>
<td>12</td>
</tr>
</tbody>
</table>
## Exclusivity

<table>
<thead>
<tr>
<th>% of flora found exclusively in respective disturbance category</th>
<th>% flora found in all disturbance categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>low</td>
<td>&lt; 1</td>
</tr>
<tr>
<td>moderate</td>
<td>3</td>
</tr>
<tr>
<td>high</td>
<td>13</td>
</tr>
<tr>
<td>highest</td>
<td>34</td>
</tr>
</tbody>
</table>
Using FQA in the Mid-Atlantic Region

- Monitoring and Assessment
  - Dose-response curves (Condition Assessment, Identifying Reference Sites, Prioritizing Wetlands For Protection)
  - IBI (Condition Assessment)
- Wetland Water Quality Standards (TALUs)
- Design and Performance Criteria (Database)
- Other (Penn’s Creek Study)
Monitoring and Assessment

(Rapid Assessment Score)

(Miller and Wardrop 2006)
Monitoring and Assessment

- Plant-based IBI
  - FQI
  - % annuals
  - % non-natives
  - % invasives
  - % trees
  - % cryptogams
  - % cover tolerant plants
  - % cover (Phalaris arundinacea)

(Miller et al. 2006)
Tier 1 wetlands are those that are capable of supporting and maintaining a high quality plant community in terms of species composition, diversity, and functional organization. Although not pristine, wetlands in this category are typically thought of as reference wetlands and can be used to establish performance criteria for mitigation sites.

- Annuals, non-native, and invasive sp typically < 10%
- FQAI score ≥ 40
- Predominately forested/Forest setting
- Tolerant cover < 30%
- Diverse assemblage of vascular cryptogams with high (≥ 6) coefficients
- No *Phalaris arundinacea*
Restoration Performance and Design Standards
Restoration Performance and Design Standards

Mean 36 sd 11

Min 21 Max 51
Other: Upper Penns Creek Study

\[ r = 0.80, \quad P = 0.002 \]  

(Miller, et al. 2009)
Thanks!

- Mid-Atlantic Wetland Workgroup Members:
  - Amy Jacobs and Alison Rogerson, Delaware Department of Natural Resources and Environmental Control
  - Walt Kordek, West Virginia DNR
  - Walter Veselka, West Virginia University
  - Kirk Havens, Virginia Institute of Marine Science

- EPA Region 3 – Regina Poeske

- Bowman’s Hill Wildflower Preserve – Jeannine Vannais, Tama Matsuoka, Linda Kelly