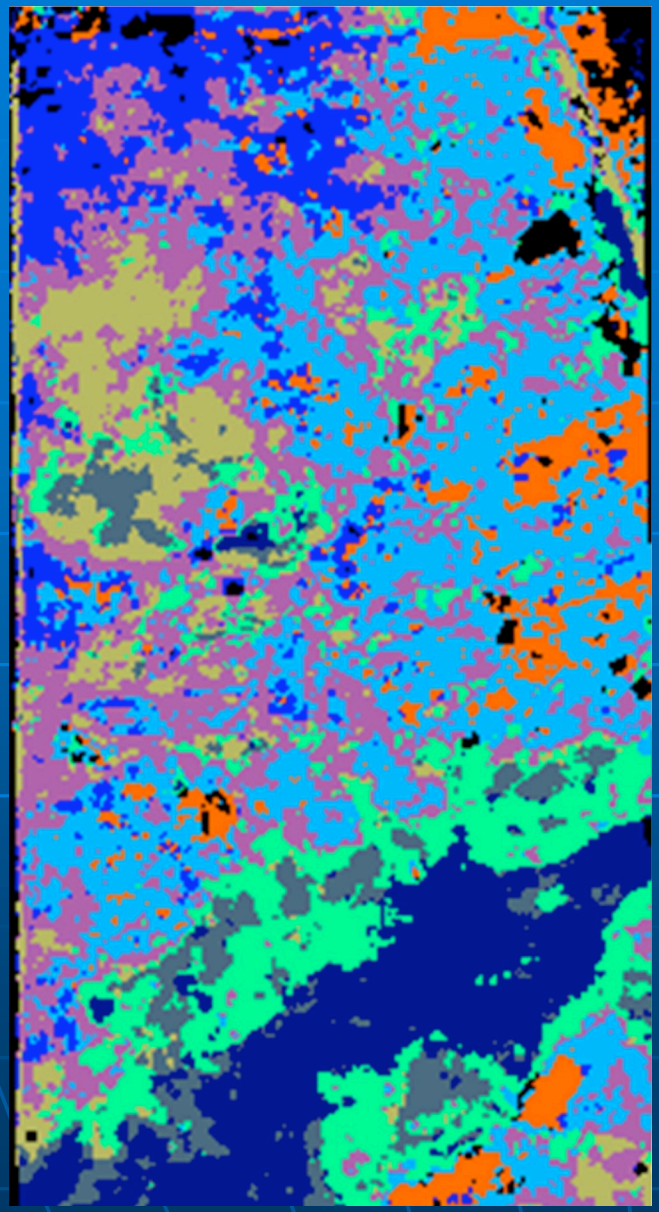
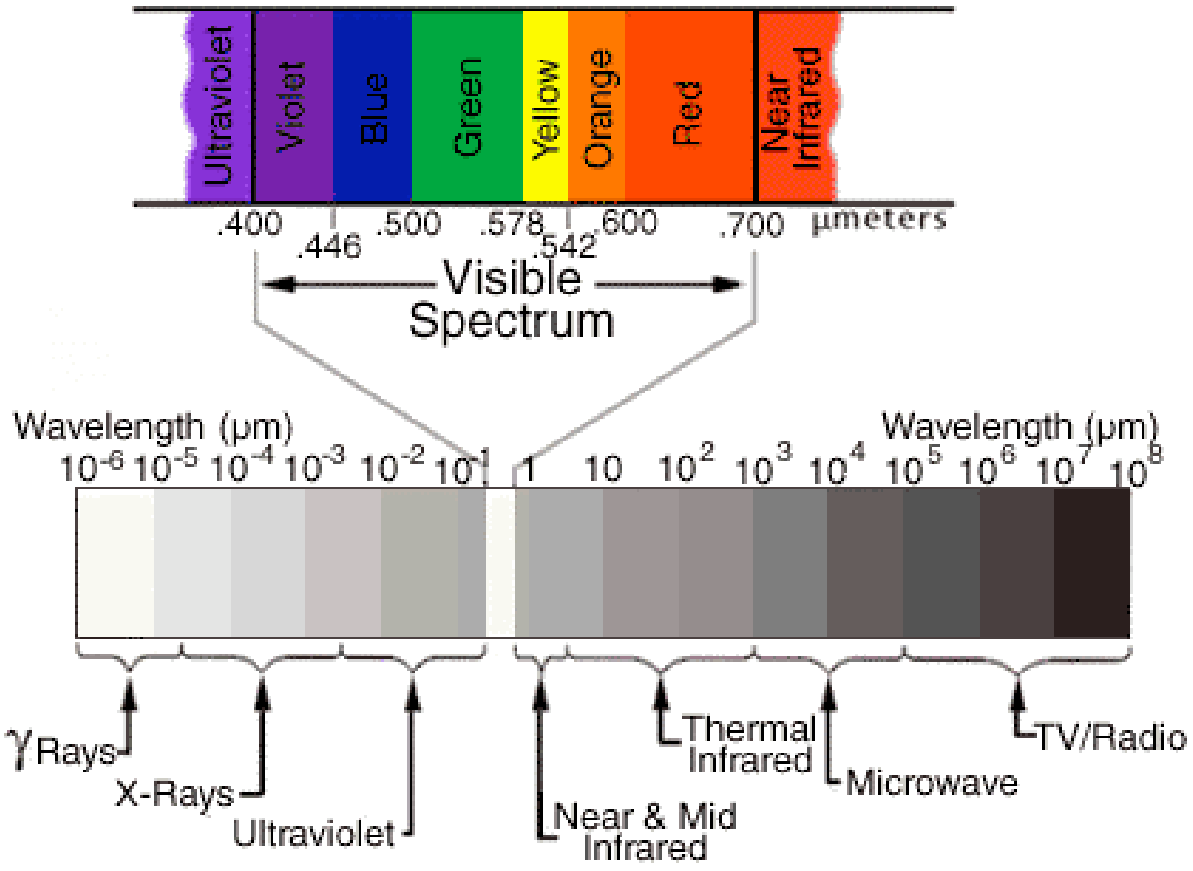


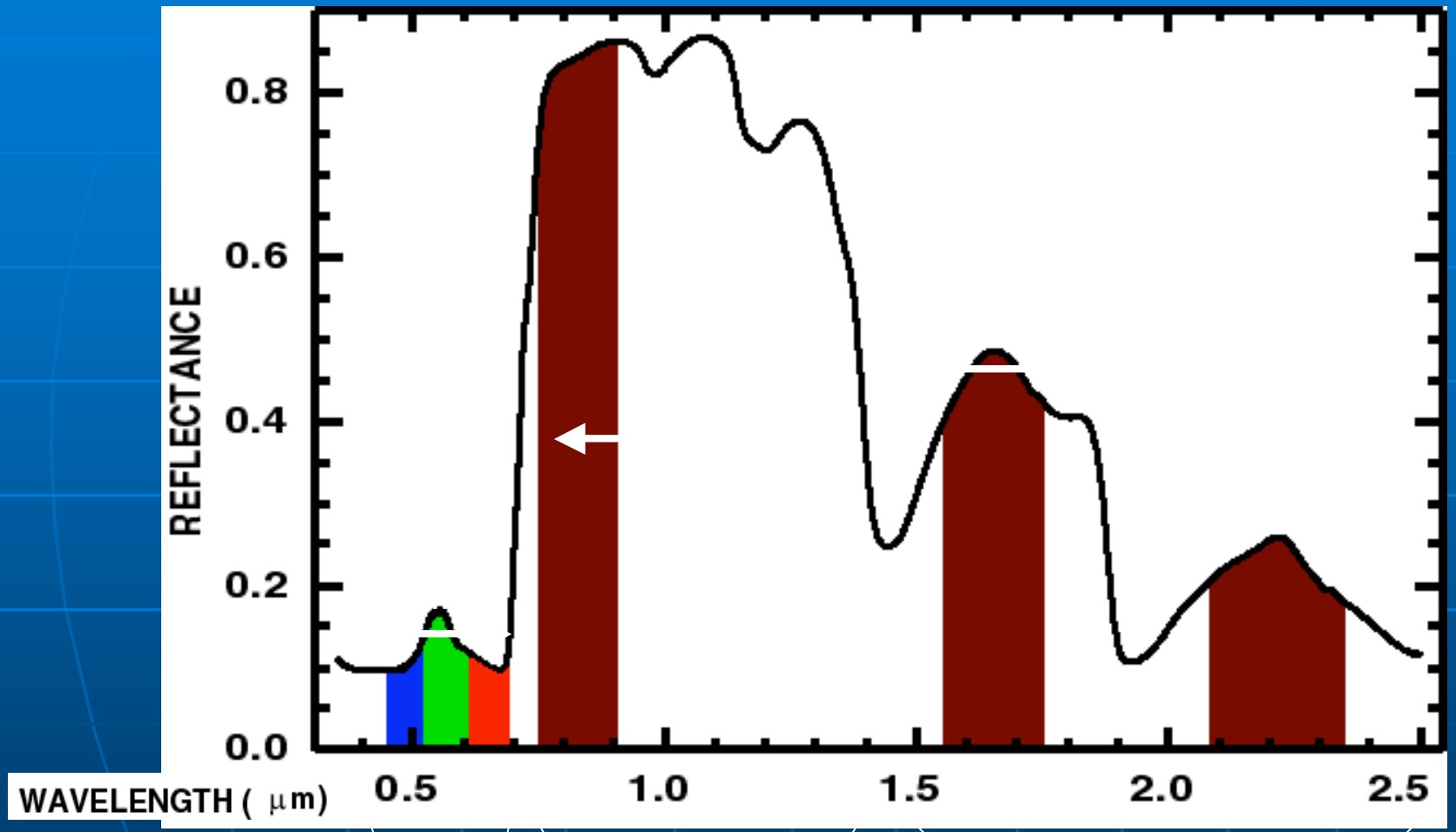
# Hyperspectral Remote Sensing Applications to the Study of Native Prairie Vegetation

John P. Tandarich, William J. Sluis, Chris J. Johannsen, Larry Biehl and Paul Carter

**Figure 1. The Electromagnetic Spectrum**



# Figure 2. Plant Canopy Reflectance



# Figure 3. Hyper-spectral Study Sites

- Reference Sites
  - Drummond Area
  - Blodgett Road West
  - Grant Creek
- Restoration Site
  - Blodgett Road

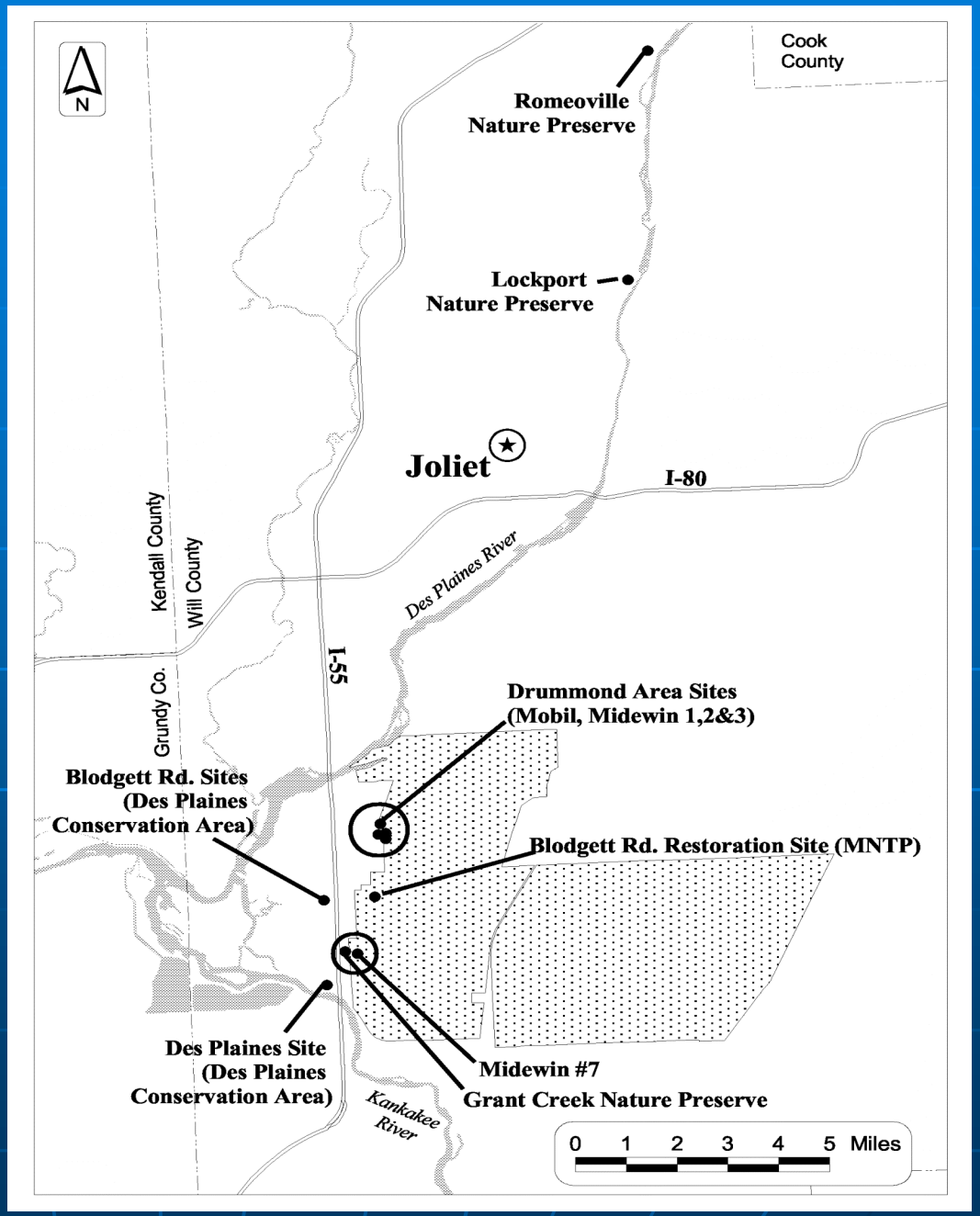


**Table 1. Grassland soils of the Dolomite Straths.**

| Bedrock Depth (cm) and Depth Classes | Soil Drainage Class | | | |
|---|---|---|---|---|
| | Poor | | Well | |
| | Soil Particle Size Class (clay %) | | | |
| | <35 | >35 | <35 | >35 |
| < 25 Very Shallow | Romeo | | Marblehead | |
| 25 – 50 Shallow | Joliet | | Channahon | Edmund |
| 51 – 101 Moderately Deep | Faxon | Millsdale† | Rockton, Ripon | |
| 102 – 152 Deep | Drummer, Selma§ | Peotone§ | Plattville, Ashdale | |
| > 152 Very Deep | Drummer, Selma | Peotone† | Jasper, Proctor | |

† Includes soils with mollic epipedons to bedrock depth.

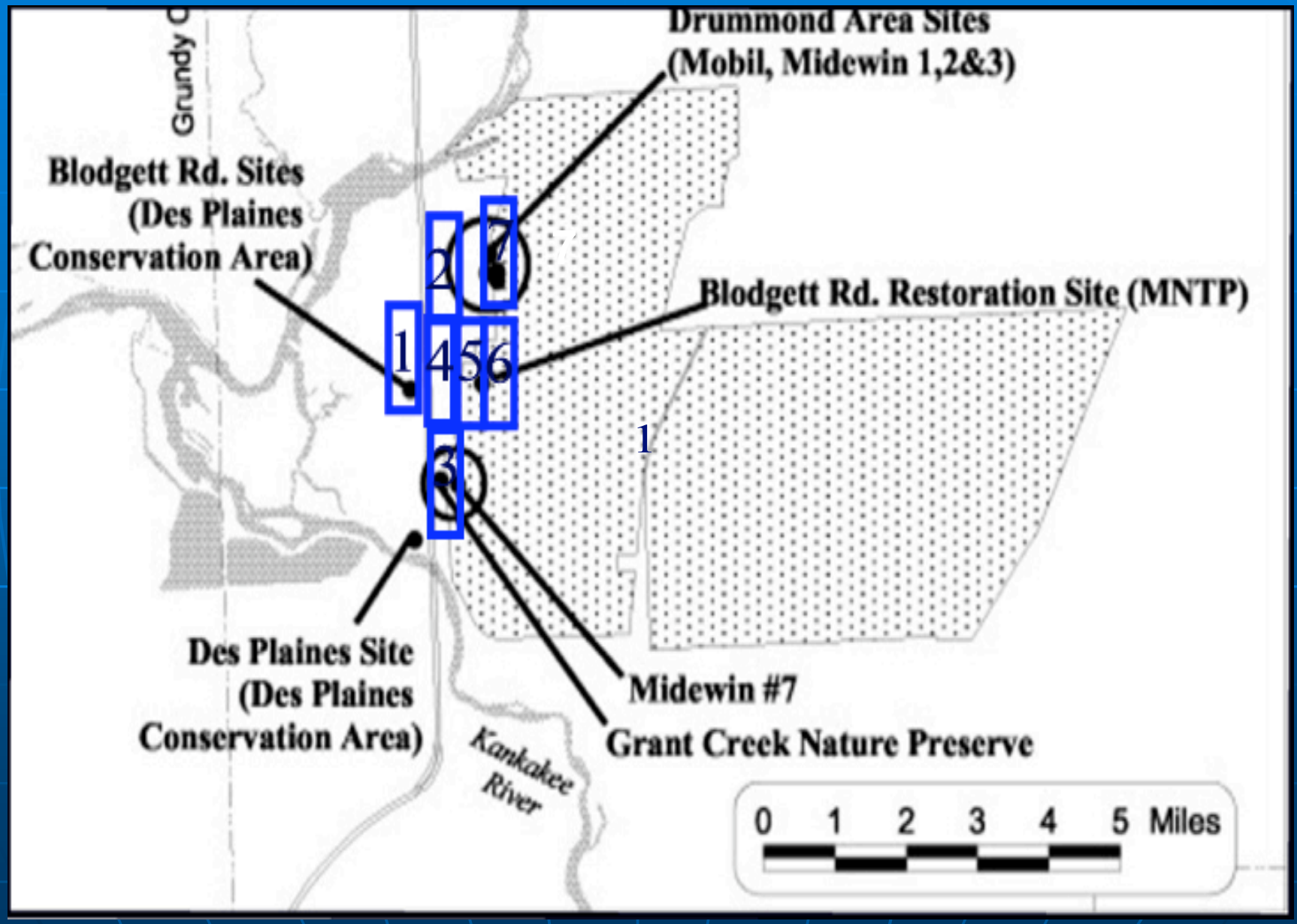
§ Bedrock substratum phase.

**Table 2. Twinspan Dolomite Strath Grassland Plant Communities.**

| No. | Soil Depth | Dominant Vegetation | Moisture |
|---|---|---|---|
| 1 | Very shallow | Upland annuals | Dry |
| 2 | Very shallow | Upland perennials | Dry |
| 3 | Shallow | Wetland perennials | Wet |
| 4 | Shallow | Upland perennials | Dry mesic |
| 5 | Moderately deep | Upland-wetland perennials | Wet mesic to wet |
| 6 | Moderately deep | Wetland | Wet |

| Table 3. Midewin Region Edaphic Analogues | |
|---|---|
| Soil Series or Phase | TWINSPAN (TC) Community |
| | |
| Channahon | 4 |
| Drummer, bedrock substratum | 3 |
| Faxon | 6 |
| Joliet | 3 |
| Marblehead | 2 |
| Millsdale | 3 |
| Millsdale, deep | 3 |
| Peotone | 3 |
| Peotone, bedrock substratum | 3 |
| Plattville | 4 |
| Romeo | 3 |
| Rockton | 4 |
| Selma, bedrock substratum | 5 |

# Figure 4. Image Locations



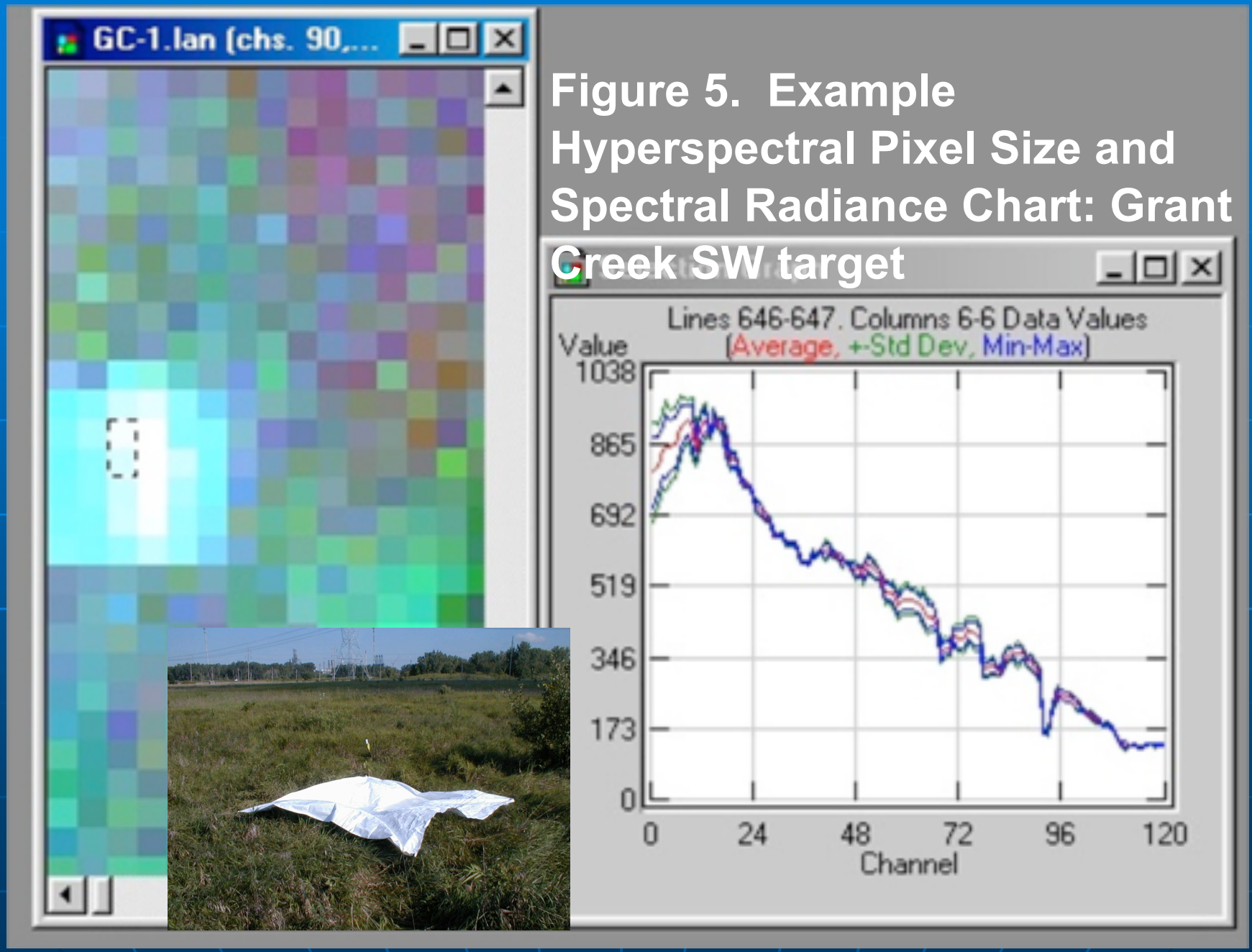
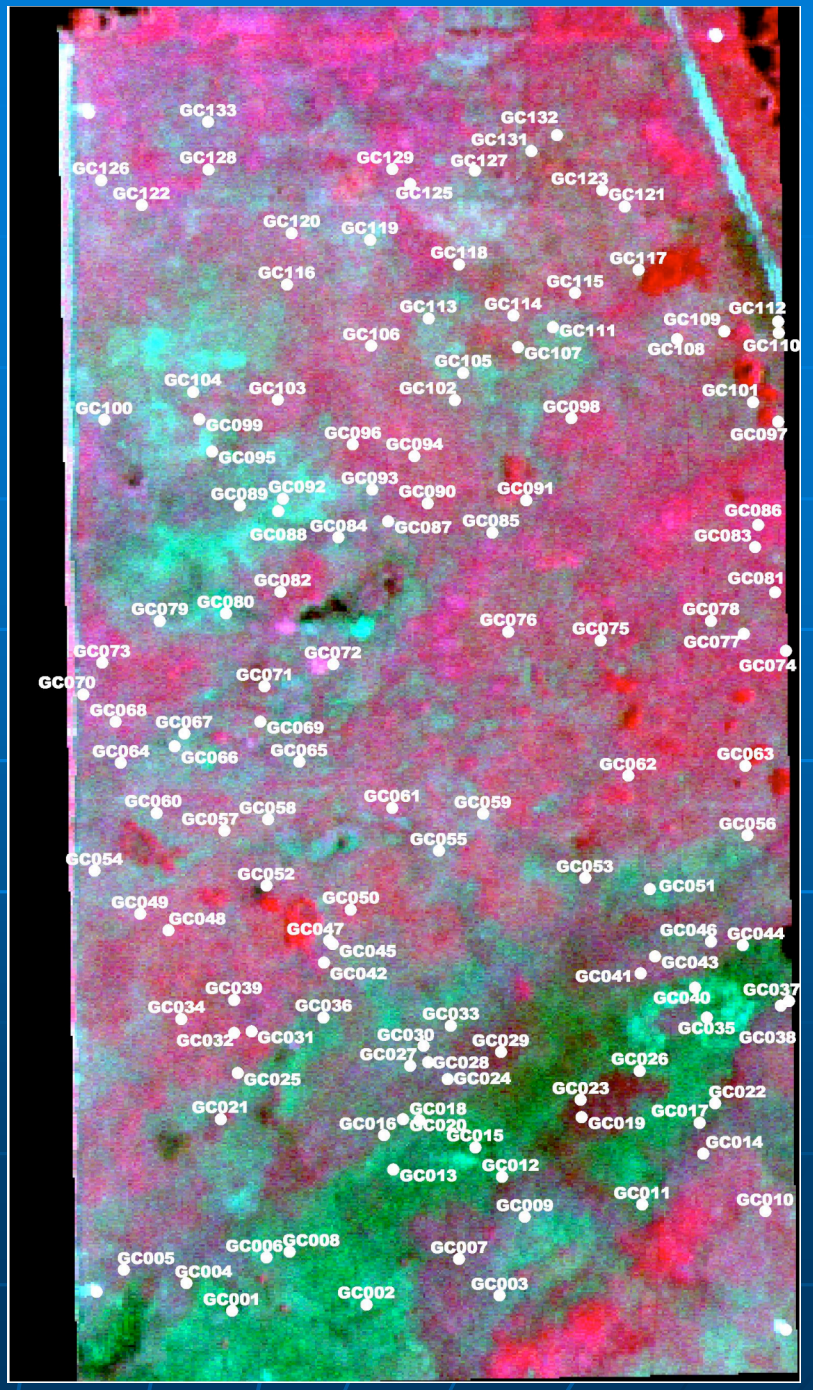



**Figure 5. Example Hyperspectral Pixel Size and Spectral Radiance Chart: Grant Creek SW target**

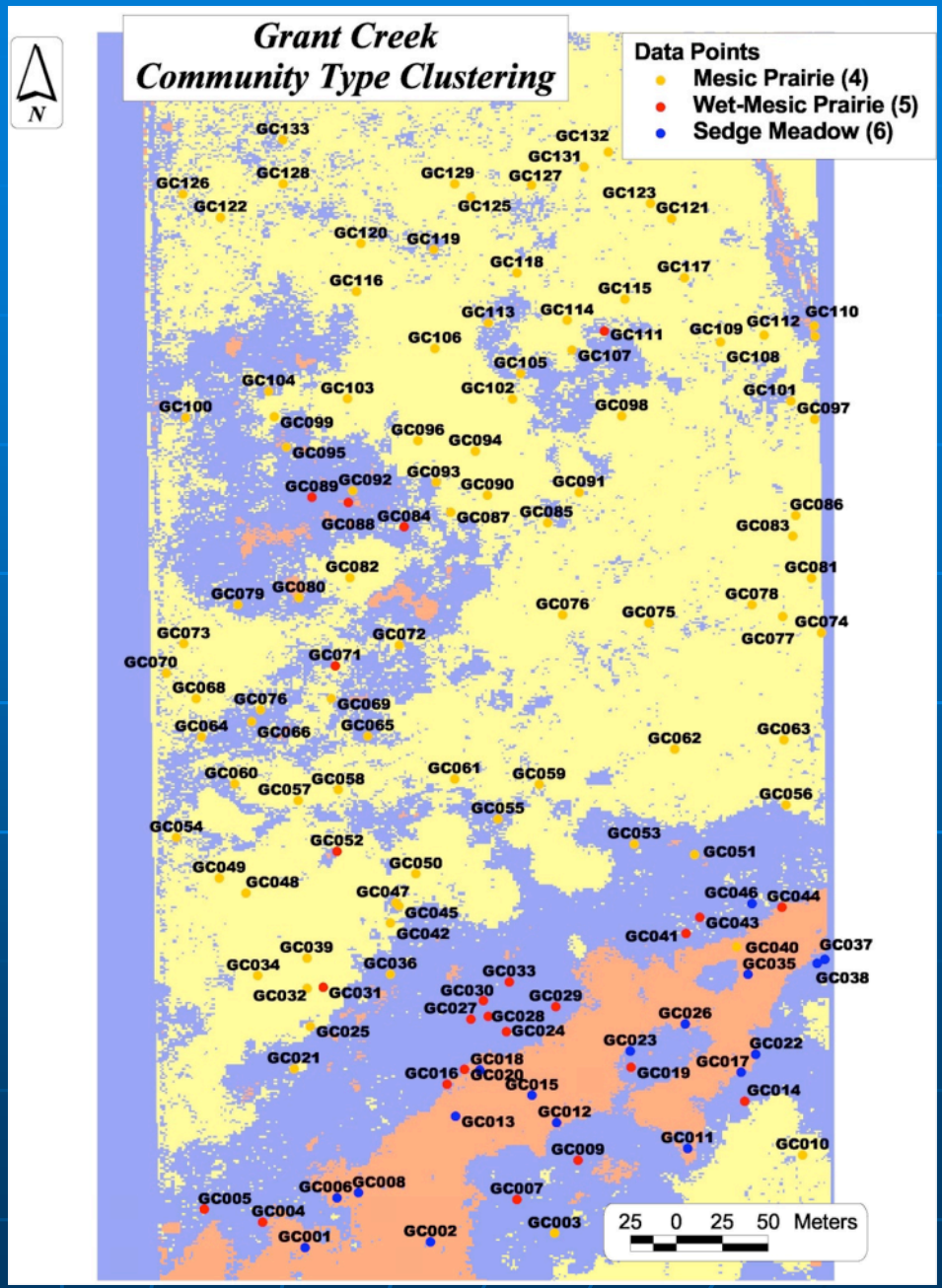
# Figure 6. Grant Creek Prairie State Nature Preserve

• Data Point

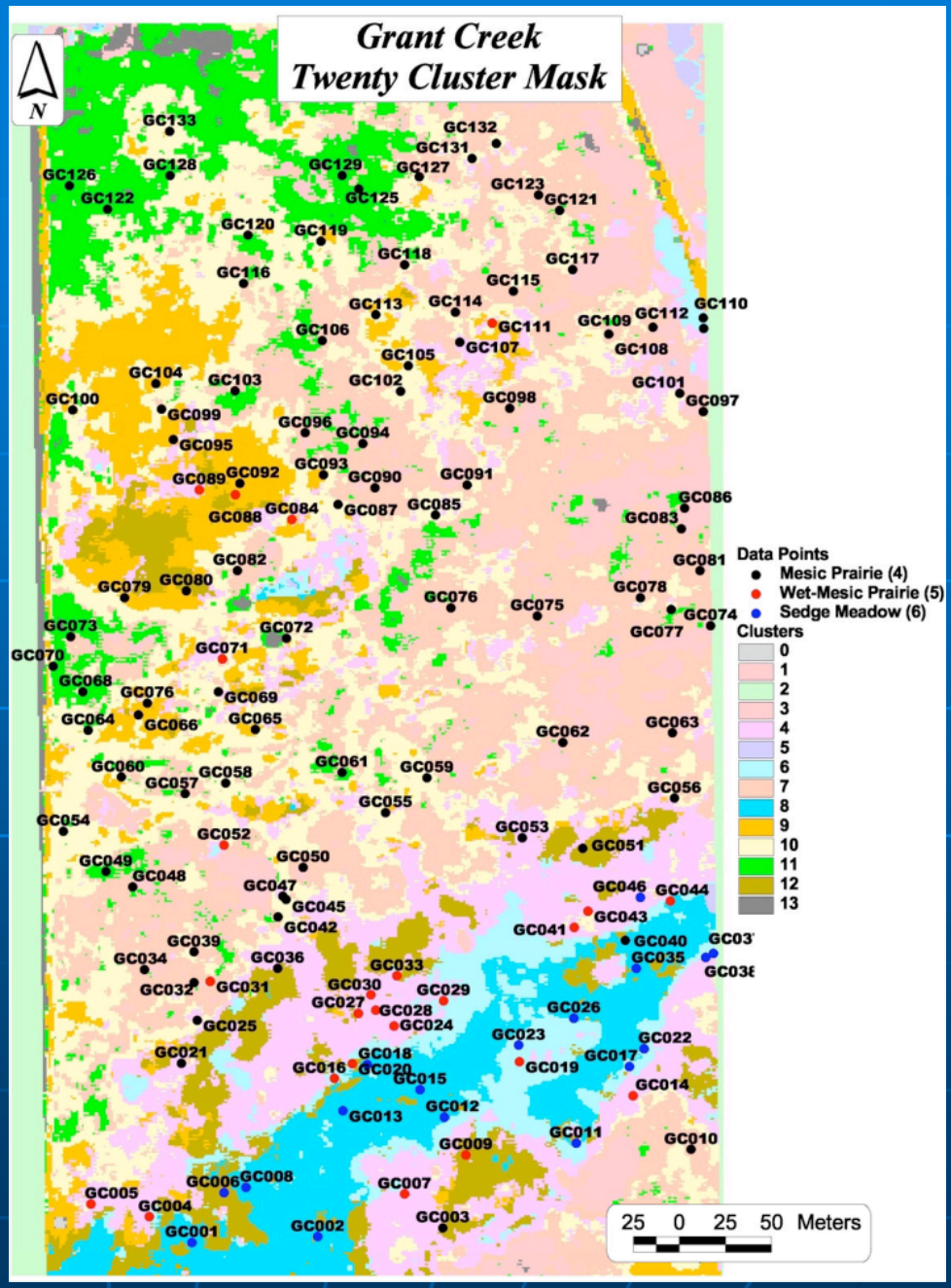
N



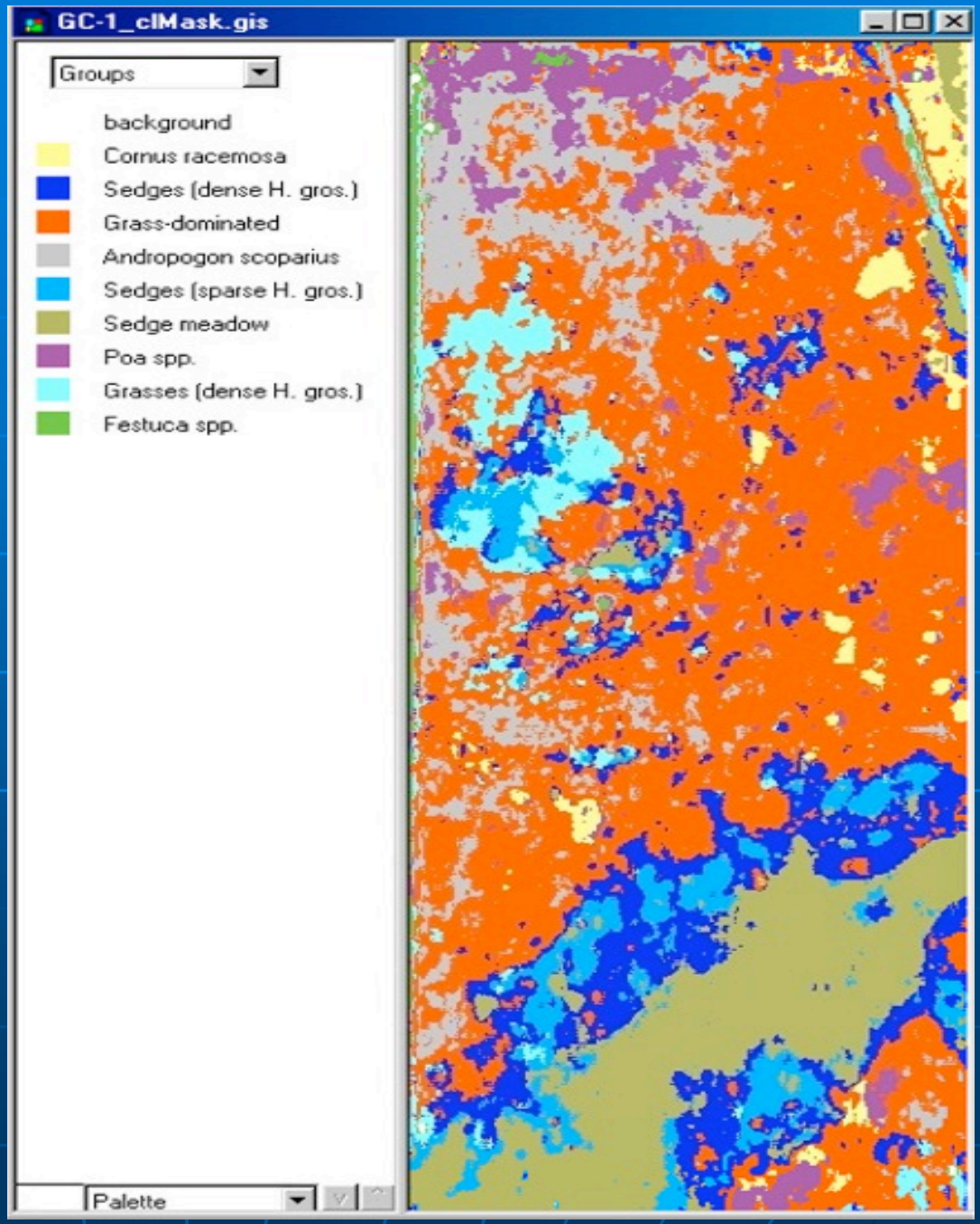
# Figure 7. Grant Creek Twinspan Communities



# Figure 8. Grant Creek MultiSpec Clustering



# Figure 9. Grant Creek: Spectrally Derived and Field Verified Plant Assemblages



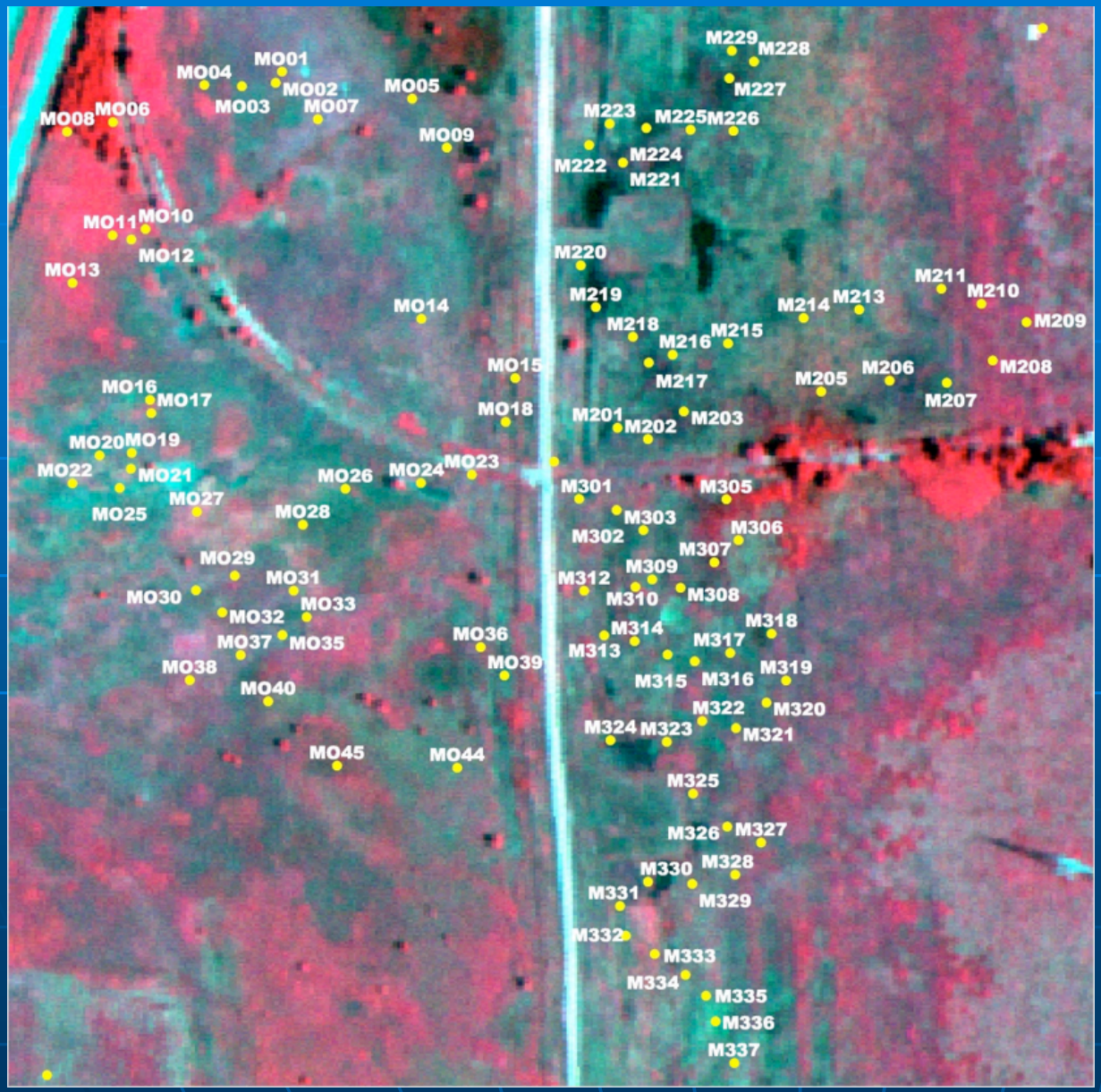
| Table 4. Grant Creek: Spectrally-derived and field verified plant assemblages | |
|---|---|
| No. | Name |
| 1 | Poa, dense grasses |
| 2 | Andropogon spoparius |
| 3 | Sedges (dense Helianthus grossesseratus) |
| 4 | Sedges, Calamagrostis Canadensis, standing water |
| 5 | Poa, Solidago altissima |
| 6 | Sedges, Calamagrostis Canadensis, no standing water |
| 7 | Sedges (sparse Helianthus grossesseratus) |
| 8 | Sparse grass (dense Helianthus grossesseratus) |

# Figure 10. Grant Creek: Ground Reference Photographs of Three of the Eight Spectrally-Derived Assemblages

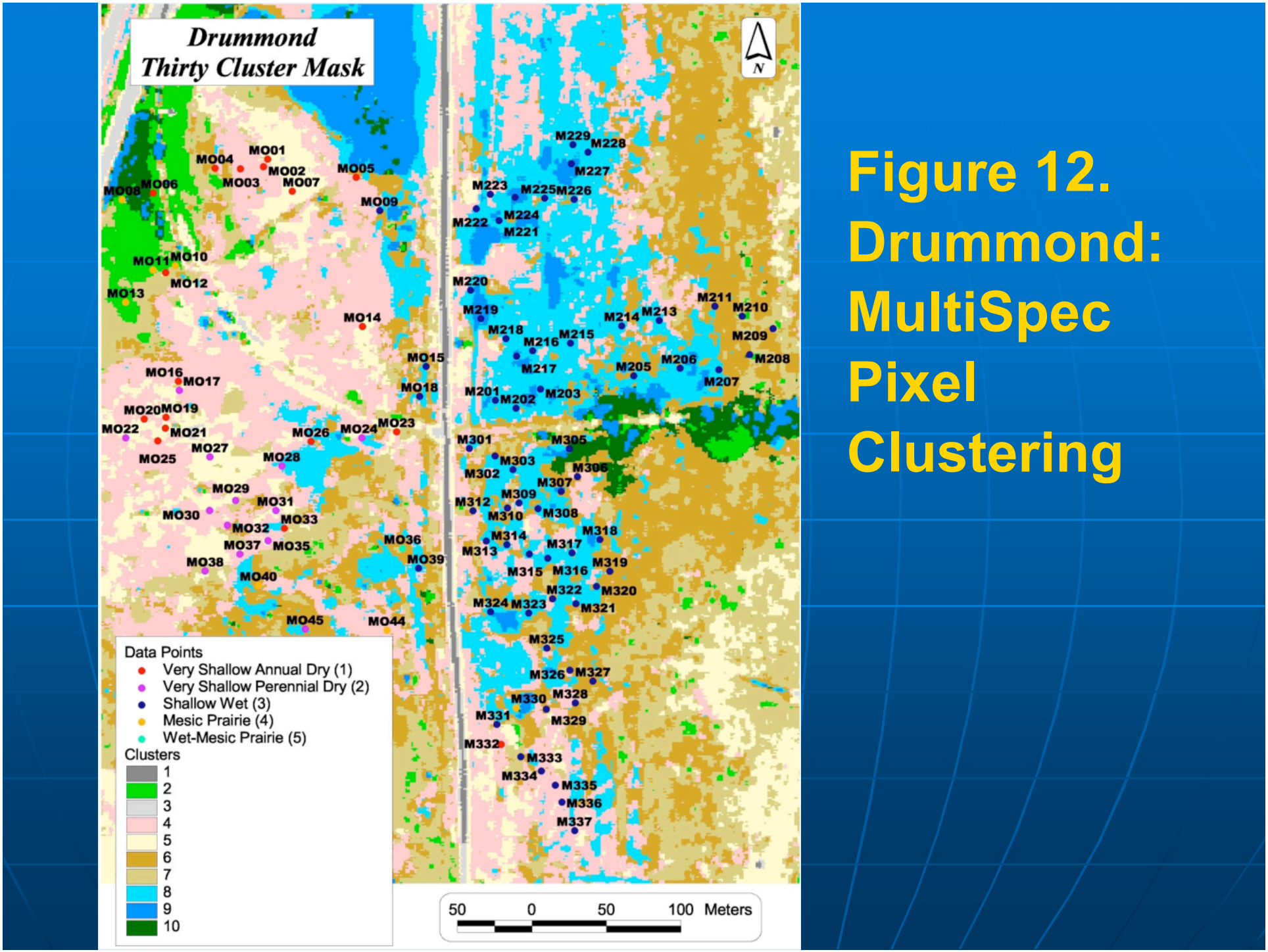
Community 2: Andropogon scoparius

Community 3: Sedges, dense H. grossesseratus

Community 4: Sedges (C. canadensis), standing water




# Figure 11. Drummond Prairie Sites




# Figure 12. Drummond: MultiSpec Pixel Clustering

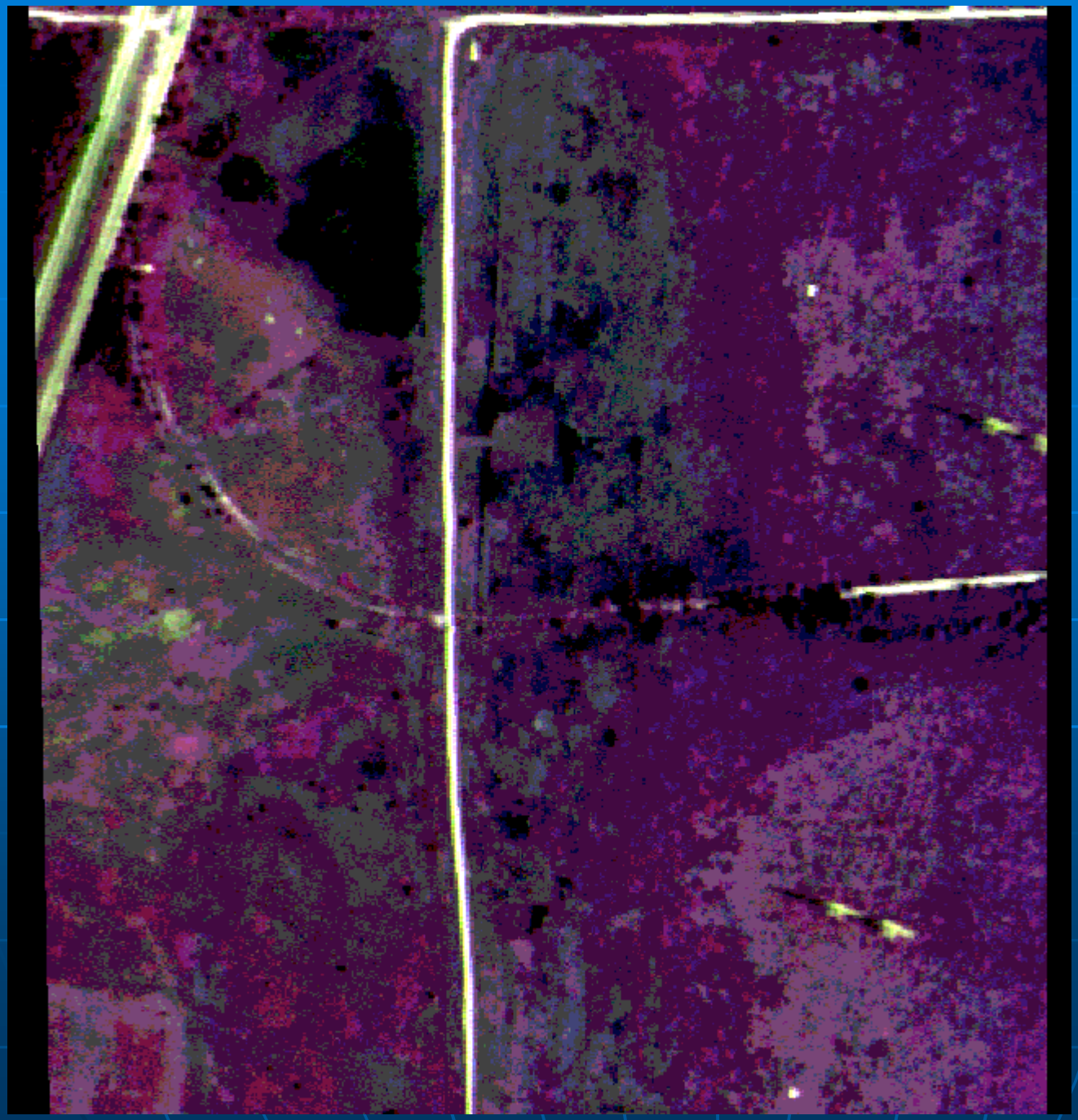


**Figure 13. Drummond: chs. 25, 4, 73**