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RFC 202

Selecting Reference Sites In Agricultural Areas — A South Dakota Case Study

Presented by

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In cooperation with

THE U.S. ENVIRONMENTAL PROTECTION AGENCY

And the

SOUTH DAKOTA DEPARTMENT OF GAME, FISH and PARKS

And the

U.S. GEOLOGICAL SURVEY -- WATER and BIOLOGICAL RESOURCES DIVISIONS

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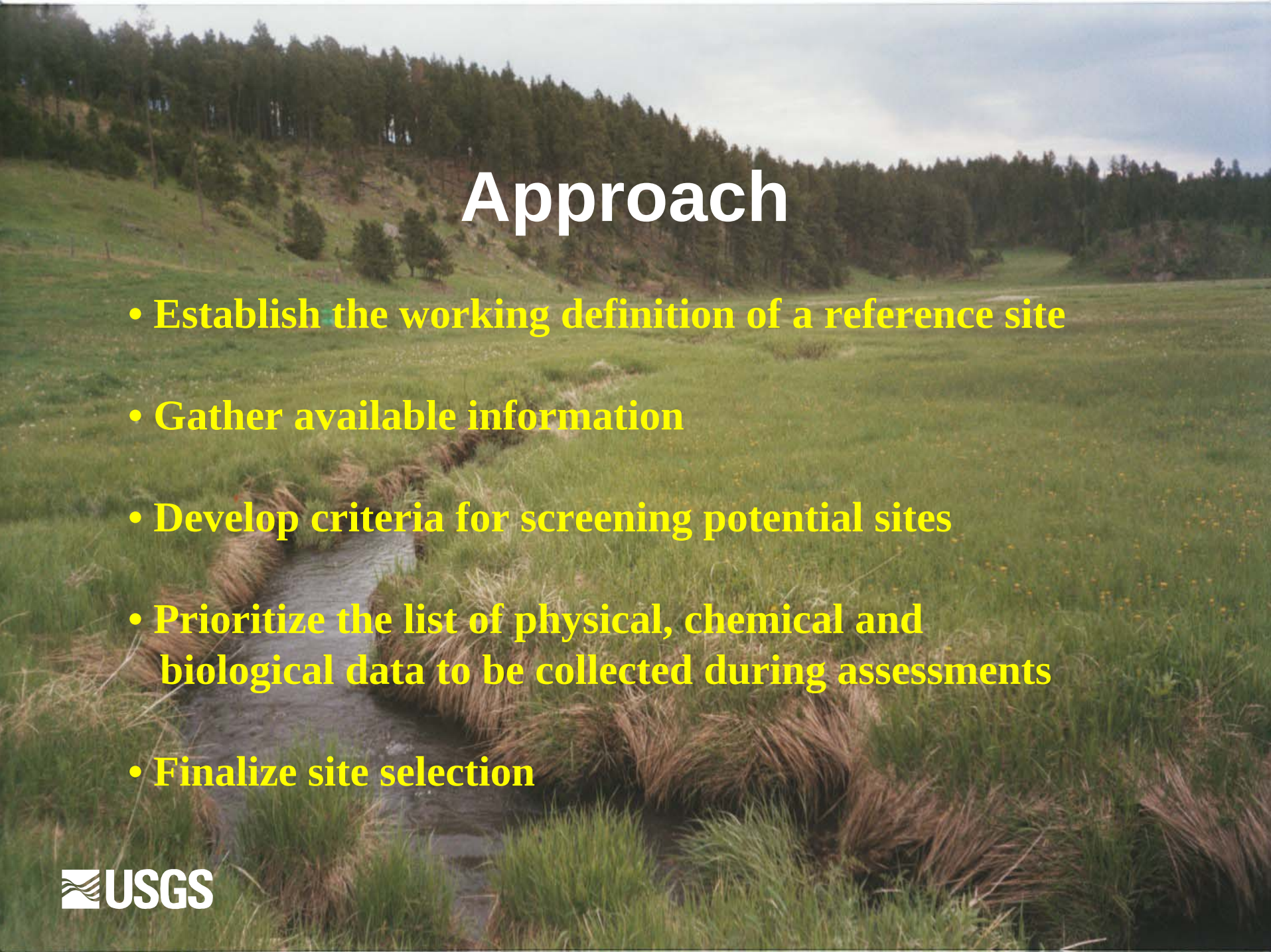

Approach

- Establish the working definition of a reference site
- Gather available information
- Develop criteria for screening potential sites
- Prioritize the list of physical, chemical and biological data to be collected during assessments
- Finalize site selection

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Establish the Working Definition of A Reference Site

- Meetings with cooperators to reach a consensus
- Develop criteria/guidelines for selecting reference sites

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South Dakota's Criteria/Guidelines

1. General flow characteristics:

   a. Sufficiently perennial to maintain viable aquatic communities during most years.

   b. Usually can be waded in all but the deepest holes.

   c. General guideline that tributaries near confluences with larger streams make good candidate sites.

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South Dakota's Criteria/Guidelines, Continued

2. **Geographic distribution and representative characteristics:**

   a. Wide geographic distribution preferred.

   b. Represents the best attainable aquatic conditions within designated area.

   c. Good representation of the four major Omernik Level III Ecoregions in the State (N. Great Plains, NW Glaciated Plains, NW Great Plains, and Middle Rockies.

   d. Represents a wide variety of different hydrogeological/land-use/landscape settings.

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Guidelines/Criteria, Continued

3. **Long-term viability/security/accessibility:**

   a. Potential for long-term maintenance in a minimal influence condition. Best prospects might include public ownership and permanent conservation easements.

   b. Physical and long-term accessibility also is a consideration.

4. **Parallelism with other programs**

   - Parallelism with other environmental monitoring programs (SDDENR, NRCS, Tribal).

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Guidelines/Criteria, Continued

5. **Multiple recommendations:**

   - **Recommendations from several sources (Conservation Districts with overlapping areas, interested agencies, Tribes, cooperators) would be indicative of high potential for candidate sites.**

6. **Best professional judgment:**

   - **Input from multiple sources.**

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Information Gathering

1. **Meetings with various State, Tribal and federal agencies and other interested stakeholders to obtain their input.**

   a. **DENR—Knowledge of point and non-point sources of pollution such as confined feeding operations, sewage treatment plants, lagoons, stock dams and impoundments and to obtain any existing monitoring data.**

   b. **Game, Fish and Parks —Knowledge of threatened or endangered species and scientific collection permits.**

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Information Gathering, Continued

c. Natural Resource Conservation Service—Conservation Districts and District Conservationists are a great source of useful information related to status of riparian areas and landowners that employ Best Management Practices.

d. USGS (WRD and BRD)—Previous investigations.

e. Tribes—Target areas of interest, obtain existing data and secure access permission.

f. Historical information—numerous sources.

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Information Gathering, Continued

g. Agricultural Extension Agency—Information on invasive species of plants, crops and pesticide applications.

h. Local government agencies and water development groups—existing data and potential development or study plans such as Total Maximum Daily Loads.

2. Form letter to various other groups or agency heads explaining the program and soliciting input for selecting candidate sites.

- Correspondence via e-mail—reach target groups quickly.

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Tools for Limiting the Number of Potential Reference Sites

- Topographic maps—Site location and accessibility issues
- Satellite and aerial photography—Land-use/land-cover and road density information
- Existing data—Physical, chemical and biological
- Conservation easements—Natural Resource Conservation Service or Game, Fish and Parks
- State and Federal Parks, National Grasslands—Public lands
- Private land ownership—County Registrar of Deeds

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Prioritize List of Physical, Chemical and Biological Data to Be Collected During Assessments

- Address specific issues?
- Data consistent with other studies?
- Budget limitations

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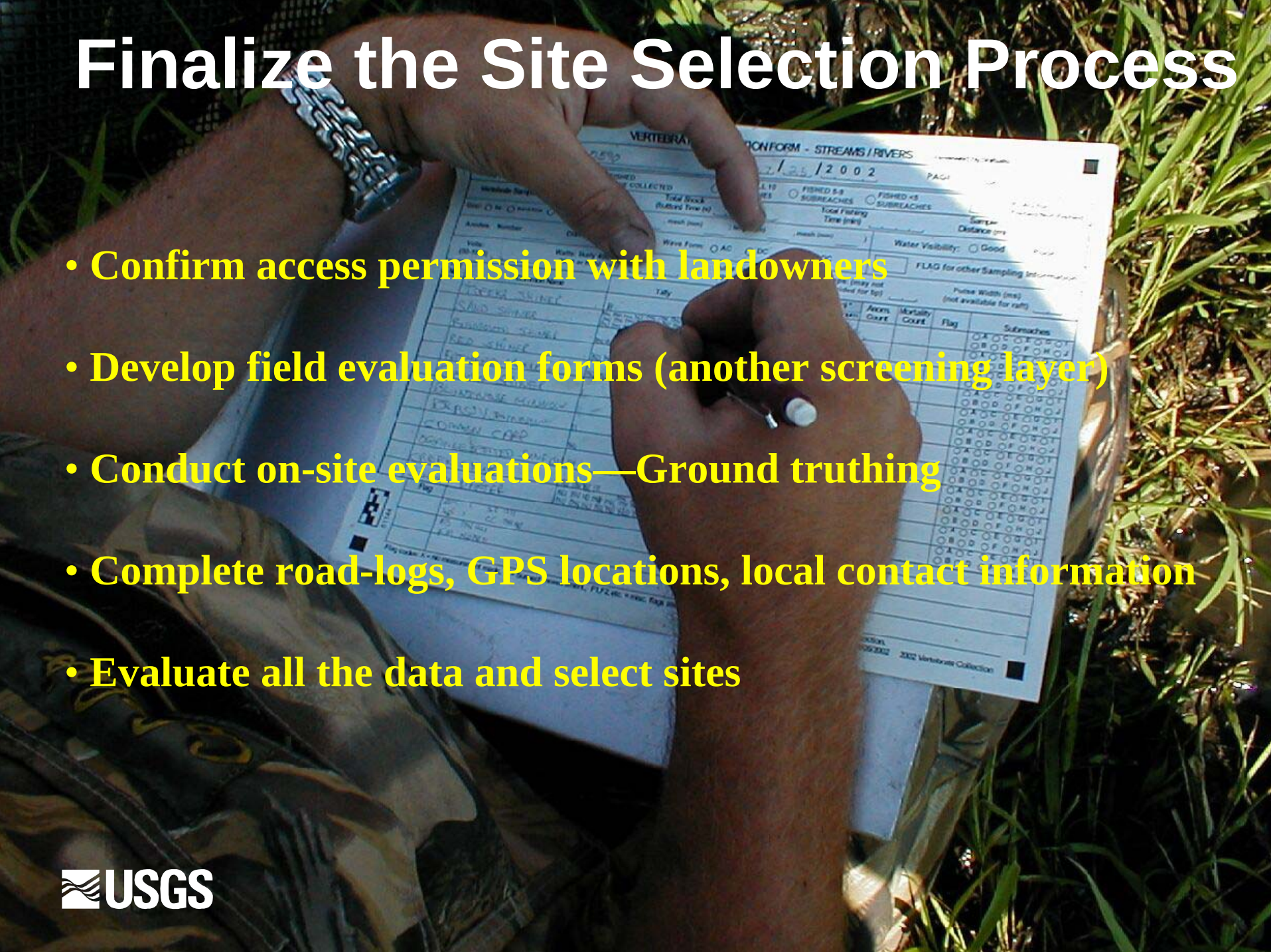
Finalize the Site Selection Process



- Confirm access permission with landowners
- Develop field evaluation forms (another screening layer)
- Conduct on-site evaluations—Ground truthing
- Complete road-logs, GPS locations, local contact information
- Evaluate all the data and select sites

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On-Site Evaluations

- Point sources of pollution within 1 mile upstream of site?
- Is animal density high, medium or low along the reach?
- To what extent is the stream embedded along the reach?
- Is rip-rap present in the reach?
- Are unnatural substrates present in the reach?
- To what extent are row crops present and is there a buffer zone (10-15 meters) between the crops and the stream?

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On-Site Evaluations, Continued

- To what extent has the riparian area been disturbed?
- What is the predominant land-use/cover within the basin?
- What is the degree of channelization?
- Are dams present within 1 mile upstream of the site?
- What is the extent of human influence within 1 mile?
- Are culverts, crossings, roads or bridges present within 1 mile upstream of the site?

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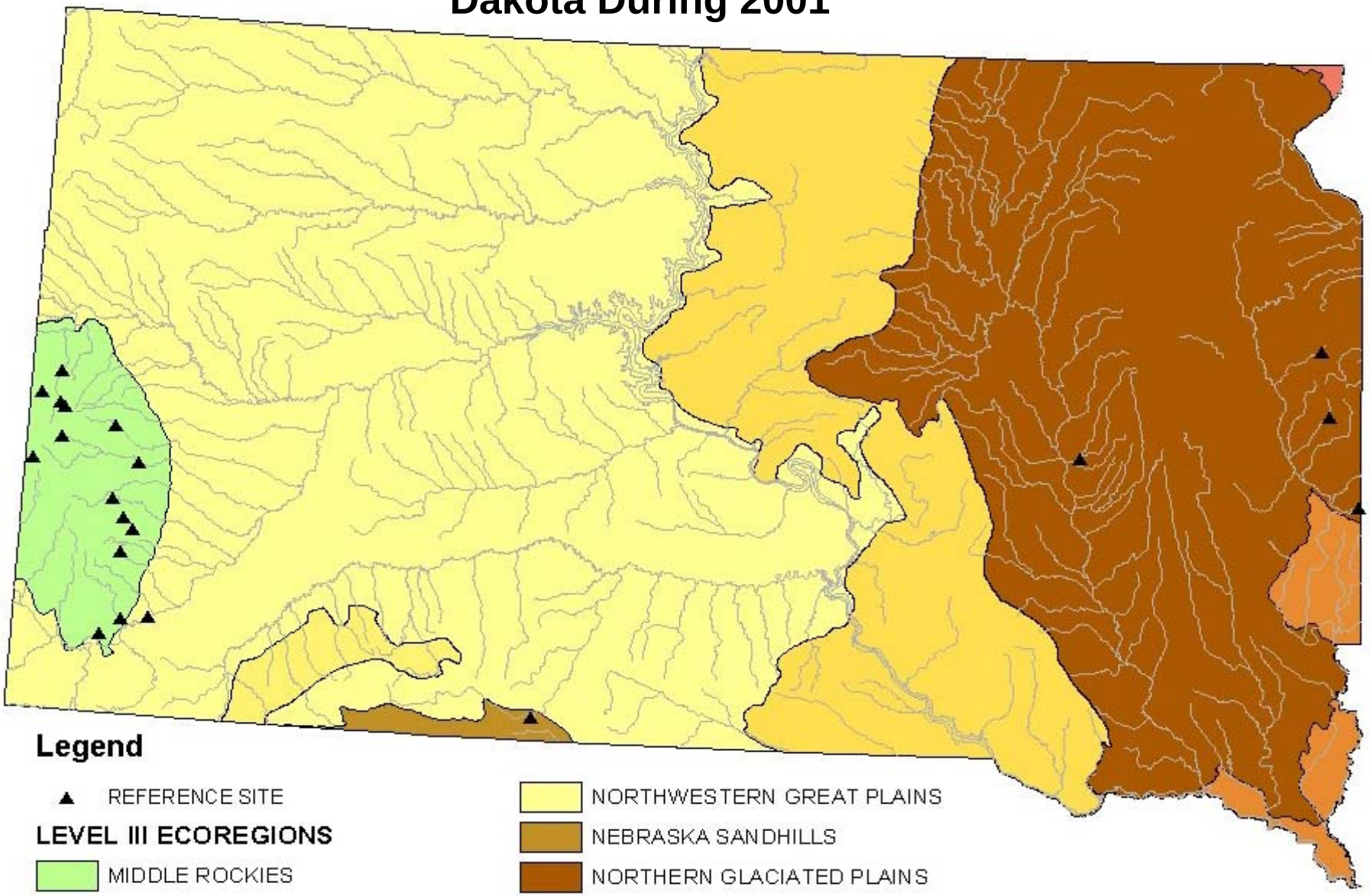
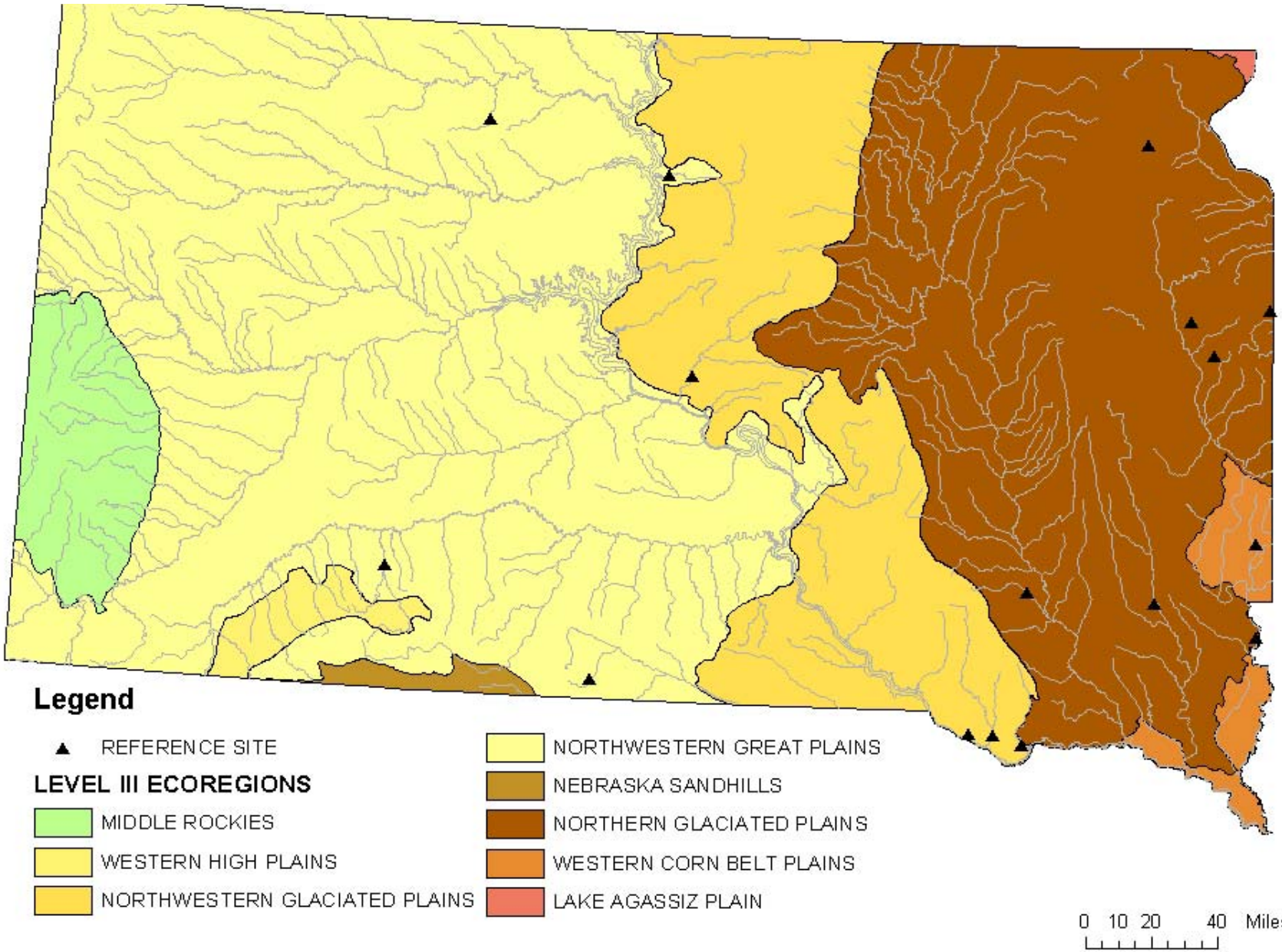
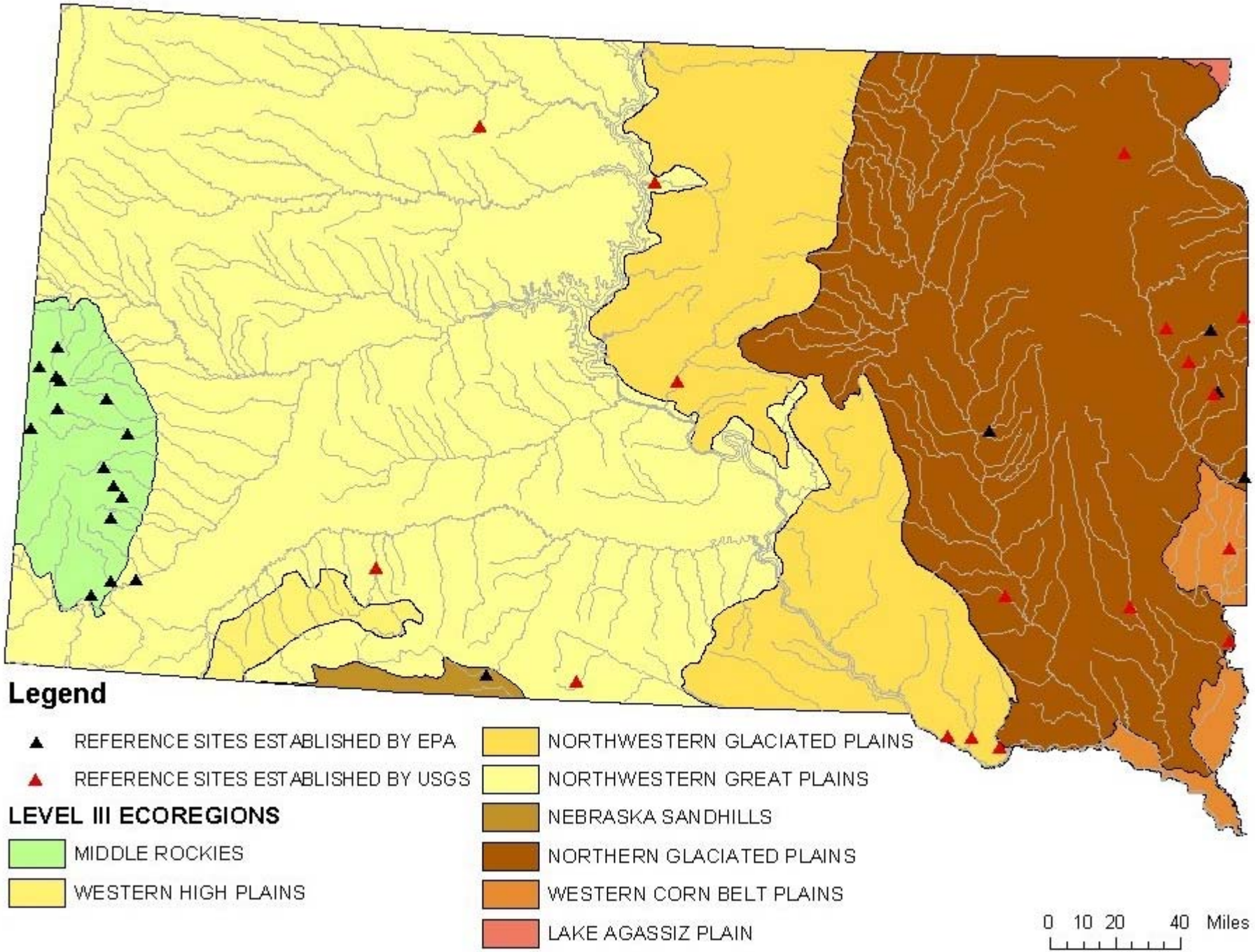
Distribution of Reference Sites Established by EPA in South Dakota During 2001



Distribution of Reference Sites Established by USGS in South Dakota During 2002



Current Reference Site Network in South Dakota



Closing Comments……

- Some number of reference sites in the network will be revisited on a rotational basis (every 2-3 years) in order to monitor natural variability (depending on available funding)

- Continued status as a reference site is dependant upon several factors:

  1. The biological, chemical and physical data from the previous assessment(s)

  2. The results of the pre-assessment field visit

  3. Comparative ranking with other sites in the area

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Questions?
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