Advisory Board Meeting - Fall 2001
Strategic Directions and Activities

October 24, 2001
NCRST-E Mission

The National Consortium for Remote Sensing in Transportation -- Environmental Assessment will develop and promote the use of remote sensing and geospatial technologies to measure, monitor, and assess environmental conditions in relation to transportation infrastructure.
Strategic Research Directions and Strategic Consortium Activities

During the first and second years of work, NCRST-E has increased its focus on developing efforts to meet a defined set of –

- Strategic Research Directions
- Strategic Consortium Activities
Strategic Research Directions

Through needs assessment, NCRST-E has developed a set of strategic research directions. Many of the strategic directions relate to streamlining of the NEPA assessment process. Wetlands Identification, Habitat Assessment, Environmental Screening, Land Cover Change Assessment, and Digital Spatial Data Libraries have been identified as specific priority areas where strategic research is needed.
Strategic Research Efforts

Through the assessment of research needs, new collaborative efforts have been developed. These new efforts will leverage end-user involvement because NCRST-E has identified partnering opportunities with transportation agencies and companies that have current “on-the-ground” projects that contain activities that match NCRST-E strategic research directions.
### Strategic Research Directions

**New Research Efforts and Partners**

<table>
<thead>
<tr>
<th>NEPA Streamlining, Wetlands Identification, and Data Fusion</th>
<th>North Carolina DOT and EarthData</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wetlands Mapping and Assessment</td>
<td>Iowa DOT and ITRES</td>
</tr>
<tr>
<td>Habitat Assessment and Characterization</td>
<td>Washington DOT</td>
</tr>
<tr>
<td>Environmental Screening and Characterization</td>
<td>Florida DOT and Washington DOT</td>
</tr>
<tr>
<td>LC/LUC and Baseline Characterization</td>
<td>Mississippi DOT</td>
</tr>
<tr>
<td>Digital Spatial Data Library</td>
<td>Veridian and MS DOT</td>
</tr>
</tbody>
</table>
For a NEPA streamlining project area in Randolph County, NC, MSU, EarthData, and NC DOT are partnering and MSU will be involved to accomplish the following tasks:

- Evaluate new hydrologic data
- Develop enhancements for wetland identification methods
- Evaluate the differences between traditional wetland mapping techniques for assessment
NEPA Streamlining
Randolph County, North Carolina

High Resolution Image Products
- CASI – II Data
NEPA Streamlining
Randolph County, North Carolina

High Resolution Elevation Data

LIDAR surface with vertical exaggeration of bare earth data
NEPA Streamlining
Randolph County, North Carolina

3-D View of Data
- CASI Draped On Elevation
- Bare Earth LIDAR
- Surface TIN
Wetland Mapping and Assessment
Eddyville, Iowa

Dune Features and
Topographic Depressions

Area of Interest
- Dune Environment
- Wetlands Features
- Rare Plants and Animals
For a new bypass project, the Iowa DOT determined that there were landscape features that gave rise to wetlands in an area where they have planned an alignment. With involvement of NCRST-E high spatial resolution hyperspectral image data will be used to identify areas where wetland vegetation occurs.
A new study is being developed to assess regional habitats in areas within Washington State.

Connections between habitat areas will be studied with respect to roads to assess habitat connectivity and provide early indication to planners that there may be habitat issues for a given route.
A new effort is underway to develop improved tools for using geospatial data for environmental screening of planned transportation projects. This effort will be conducted with transportation agencies and will build upon existing approaches and applications.
NCRST-E is conducting an assessment of land cover and land use change in the Mississippi coastal corridor with the purpose of identifying changes due to transportation and land development. A full presentation of this effort has been provided for the Fall 2001 NCRST-E meeting.
A new effort is underway to develop Digital Spatial Data Libraries (GeoLibrary) for transportation planning and environmental assessment. The effort will result in a report that provides case studies about the current use of GeoLibraries in transportation agencies and guidelines for developing and using such capabilities.
The effective use of remotely sensed data requires large data storage and distribution capabilities within a system that maintains the data and makes it available to users and their applications. GeoLibraries provide such capabilities.
Geospatial Library
Prototype Architecture (from ESRI)
Y1 Strategic Consortium Activities

As the lead university in the environmental assessment consortium, MSU was responsible for several strategic first year activities:

- Project Development
- Consortium Management
- Acquisition of Data Products for Projects
- Outreach Activities
Y2 Strategic Activities

The responsibilities for the second year include the following activities:

- Project Development
- Consortium Management and Increased TAP Involvement
- Acquisition of Data Products for Projects
- Outreach Activities
- International Projects Development
- Application and Cookbooks Development
- Development of a Center of Excellence
Y2 New Strategic Activities

For the second year of the consortia, the new strategic activities for NCRST-E are identified as follows:

- Increased Technical Outreach
- Increased TAP Involvement
- International Programs
- Technical Guidelines (Cookbooks)
- Development of Center of Excellence
The NCRST-E has developed new research efforts that align with the results of ongoing needs assessments. As previously discussed, the new efforts target research through technical outreach with partners that have relevant on-the-ground projects.
Y2 Strategic Activities
Consortium Management

NCRST-E consortium management activities have included providing guidance to partnering projects, developing the consortium budget and research plans for years two and three, providing reporting and invoicing to RSPA, conducting consortium meetings, attending planning meetings, conducting outreach and briefing functions, developing publications and outreach materials, and supporting the development of advanced research capabilities.
Y2 Strategic Activities
Increased TAP Involvement

The first round of TAPs required that NCRST-E work with and assist in the coordination of research for selected demonstration projects. For the newly selected TAPs, NCRST-E will be coordinating with the following groups:

- Virginia DOT
- Washington DOT
- Mississippi DOT and Veridian
Y2 Strategic Activities
Acquisition of Data Products

New data products have been acquired including hyperspectral image data, elevation data, multispectral image data, and other types of GIS and RS data. Additionally, other types of data are being evaluated for use in environmental assessment including:

- LIDAR data
- IFSAR data
- New satellite image data products
NCRST-E outreach activities include the following areas:

- Presentations and briefing
- Technical outreach projects
- Attending and presenting at conferences
- Attending planning meetings
- International outreach
- Development of technology notes, briefs, and guidelines
- Development of a Center of Excellence
Y2 Strategic Activities
International Outreach

NCRST-E has identified an international outreach partnering opportunity with the Institute for Environment and Sustainability at European Commission DG Joint Research Centre (JRC). Three possible projects were considered including:

- Corridor study between Prague and Dresden
- Regional area study in Estonia
- Regional area study in Northern Ireland

The corridor study between Prague and Dresden was selected for NCRST-E collaboration.
Y2 Strategic Activities
Cookbook Development and Publication

Current list of NCRST-E Technology Guidelines planned or in development:

- LC/LU Change Detection and Characterization
- High-Resolution Elevation and Image Data for Streamlining Environmental Assessment
- Remote Sensing and Geospatial Technologies for Wetland Mapping
- GeoLibraries for Transportation Planning and Environmental Assessment
- Assessing the Need for Remotely Sensed Data for Environmental Assessment in Transportation Projects
Y2 Strategic Activities
Development of Center of Excellence

For the NCRST-E to succeed in the task of developing a world-class center of excellence for the consortium’s specific area of responsibility, certain fundamental core functions are being developed and fostered.

- Advanced Curriculum Development
- Graduate Student Research Support
- Advanced Data Management
- RS/GIS-T Computational Lab
- Web Server Development & Support Resources
NCRST-E Strategic Keys to Success

- Identify stakeholders and their information needs.
- Understand which information needs (i.e. products) can be met with remote sensing and geospatial technologies.
- Understand accuracy or variance permitted in EIS process.
- Successful technical outreach that enables us to match real needs with relevant research.
- Effective communication of developed remote sensing technology and methods for use and application in the environmental assessment of transportation projects.