

# Southern Appalachian Regional Information System SARIS

## Progress Report, January–April 2000

### Summary

The SARIS project is progressing rapidly toward implementation of initial core capabilities and the prototyping of web mapping applications. The exploratory phase and first part of the user-needs assessment found that most SAMAB member agencies have made little progress implementing National Spatial Data Infrastructure (NSDI) standards and technologies at the regional level. We formed a partnership with ESRI, Microsoft, RTSe USA, USGS, TVA, and several units of the University of Tennessee to apply for a Web Mapping Testbed grant from the Federal Geographic Data Committee (FGDC). The grant would supplement our funding for SARIS development and enable SAMAB to spearhead NSDI implementation in the region.

### Background — System Components

SARIS will have three principal components:

- 1) A data warehouse for the SAA data, plus new and enhanced data sets;
- 2) Communications services and tools integrated with a knowledge base about regional data sources, data sets, and their use; and
- 3) A web mapping interface that will let anyone generate custom thematic maps within a standard web browser.

### Background — SARIS Development Schedule

• Exploratory phase	Jan/Feb 2000
• User-needs assessment	Mar/Apr 2000
• Technology evaluation and system design	Apr/May 2000
• Rapid prototyping and implementation	starting May 2000
• SARIS operation and maintenance	starting May 2000

### Exploratory Phase

The Southern Appalachian Assessment (SAA) necessitated a tedious process of gathering spatial data sets from participating agencies and other sources, converting the data to a standard projection, translating them to a common file formats, and extracting the data for the needed area, before the needed data could readily be used in a Geographic Information System (GIS).

Most potential users of geospatial data lack the money, time, and perseverance to do such arduous data preparation on their own. The overwhelming demand for the CD-ROM edition of the SAA database and the large number of downloads of SAA data sets from the SAMAB website, illustrated that fact very clearly.

Fortunately, the National Spatial Data Infrastructure (NSDI) provides interoperability and telecommunications standards that have the potential to eliminate the need for much of the rote data-preparation work that consumed a substantial amount of SAA funding. Being able to use the NSDI, therefore is an important design goal for SARIS.

The primary objective of the exploratory phase was to determine opportunities for leveraging NSDI capabilities in the design and implementation of SARIS. During January and February, we solicited input from the SAMAB GIS committee and other member-agency contacts about the status of work in each agency to implement Executive Order 12906, of April 13, 1994, which directs Federal agencies to make their datasets accessible through the National Geospatial Data Clearinghouse.

We soon discovered that implementation of NSDI technologies and sharing of data sets through the Clearinghouse are progressing much more slowly than we had anticipated. While several agencies have implemented a Clearinghouse node at the national level, few data sets have been contributed that cover the Southern Appalachians at a level of detail suitable for regional assessment. A variety of technical, staffing, and funding problems have prevented regional offices from starting to routinely document even their new data sets with standard-compliant metadata, which is a

prerequisite for registering data sets with the Clearinghouse. Internet security concerns also seem to be an important obstacle to regional offices establishing their own Clearinghouse nodes.

Apparently, many of the creators and users of geospatial data are unaware of what other agencies or even other groups within their own agencies are doing in this field. A lack of timely responses from several agencies to our information requests, a common inability of identifying staff well-informed about all of an agency's regional activities related to geospatial data, and difficulties contacting some of the individuals identified as (possibly) working on related projects, made it necessary to extend the exploratory tasks.

Conclusions from the exploratory work:

- High priority is indicated for implementation of SARIS communications services and tools with integrated knowledge base about regional data sources, data sets, and their use.
- In order for SARIS to benefit from the NSDI, SAMAB spearhead implementation of NSDI standards and technologies and take an active role encouraging and assisting its member agencies to do likewise.

We applied for a \$62,000 Web Mapping Testbed grant from the Federal Geographic Data Committee's Cooperative Agreements Program, which would provide additional funding for SAMAB to implement and promote NSDI capabilities.

### **User-Needs Assessment**

The first part of the user-needs assessment started ahead of schedule with a meeting in Atlanta on January 27, two meetings in Asheville on February 3, and a series of one-on-one interviews and telephone conversations. Participants in these meetings and interviews included staff from Federal, state, and regional agencies as well as representatives from academic institutions and non-profit organizations. We discussed uses and weaknesses of the SAA database, present and anticipated future program priorities and resulting data needs, existing agency hardware and software environments, user skills and training issues, and many other aspects of user expectations and system capabilities that may be necessary to meet needs and expectations.

Wolf Naegeli gave a presentation on the SARIS project to the joint meeting of the SAMAB Foundation Board and Cooperative Executive Committee on February 9, and he participated in the Southeastern Ecological Framework workshop in Atlanta on April 17 and 18. These events provided additional opportunities to meet stakeholders and discuss future information needs of the SAMAB constituency.

The difficulty we experienced with the exploratory tasks of identifying and engaging staff who have a good grasp of their agency's spatial data activities and needs in the southeastern region carried over into the assessment of user needs. Moreover, most of those from whom we were able to elicit information had little or no experience with web mapping applications and lacked sufficient understanding of web mapping concepts to articulate how the SARIS web mapping component should be implemented to best support their needs. Therefore, we decided to extend the needs assessment and postpone its second, more structured, part until the communications and knowledge-base subsystem of SARIS is operational. Its capabilities will enable us to use interactive demonstrations to explain concepts and implementation options in a way that makes it easy for users to visualize which features would be most useful in their work and be most likely to enhance their productivity.

### **Technology Evaluation and System Design**

Our survey of the marketplace for available products to implement an advanced geospatial information system uncovered many promising technologies. At the present time, however, most products are not yet compliant with FGDC and Open GIS Consortium (OGC) standards for vendor-independent interoperable web mapping applications. ESRI and Oracle were the first two companies to receive OGC product certifications. In our review, their products stood out as the most advanced, powerful, and scalable. ESRI GIS products already predominate in our member agencies. Selecting ESRI software for SARIS will facilitate integration of SARIS capabilities in existing agency workflows and minimize training requirements. A draft of the high-level SARIS system architecture is attached.

### **Rapid Prototyping and Implementation**

We registered samab.org as an Internet domain. The SAMAB web site — which will become the portal to SARIS — now can be reached at <<http://samab.org/>>.

The University of Tennessee's SunSITE will continue to host the SAMAB web presence, including SARIS. UT SunSITE staff already have installed a lyris server, which will be needed for the SARIS communications services. The UT Systems Development Institute (SDI) has installed an Isite server, which will be registered as the SARIS node of the National Geospatial Data Clearinghouse. After configuration and testing by SDI, the lyris and Isite servers will become the foundation for the first operational SARIS components in May.

We received over 30 responses to our call for volunteer "tire kickers" to evaluate prototypes of SARIS user-interface modules and to provide feedback on the system as it is developed (see SAMAB newsletter, March 2000). The tire-kickers group will begin its work in May.

**Funding**

To date, we spent some \$25,000 on the SARIS project, which is about 30% below initial estimates. The rate of spending will increase as we begin rapid-prototyping of user-interface modules and system functions.

Because of the resource intensive nature of GIS applications, SARIS loads on the UT SunSITE system resources probably will be at least an order of magnitude greater than the loads generated by the present SAMAB web site. We have reached agreement with the UT SunSITE on hosting SARIS. They will provide free to SAMAB:

- SunSITE CPU-hardware use
- Internet connectivity
- Operational system administration
- Regular data backup services

Moreover, SunSITE is willing to loan us a graduate assistant Java programmer to work as a member of SDI's SARIS development team.

SAMAB will be responsible for the software license fees of the SARIS server software and for functional configuration and management of SARIS software services. SAMAB also will need to pay for the storage space occupied by SARIS programs and data. We do not yet have good estimates of SARIS storage needs, but we estimate the one-time investment in highly-reliable disk arrays to be between \$7,000 and \$16,000. Except for the lyris server license, which will be \$800, we have not yet negotiated license fees for other server software. We hope to obtain free loans for at least the first year of operation or sizable discounts from most vendors. We do not yet have estimates of SARIS system loads. Some of the server software we will need has only been introduced recently or is still in pre-release version. Thus there is no reliable experiential data available to estimate performance and the number of units needed for SARIS. Full commercial licensing for SARIS server software may be in the \$25,000 to \$40,000 range per year.

Budget Scenario Ranges for FY'01 (\$ x 1000)

Labor	System development	40 – 130
	Operational management	10 – 20
	Metadata development	0 – 40
Hardware		7 – 16
Software		10 – 40
<b>Total</b>		<b>67 – 246</b>

The low number assumes extremely generous loans and discounts of software, and only little development to augment the functionality of the SARIS beyond the intil core capabilities. Faster, more ambitious SARIS development would be more attractive to software vendors as a showcase for their technologies. Thus the low number may be unrealistic. The high numbers assume award of a \$62k grant from the Federal Geographic Data Committee for SARIS participation in the Web Mapping Testbed, and a more substantial development program funded by SAMAB, individual agency programs, or third-party sources. It also includes generation of Metadata for most or all of the SAA data sets and for a fifty-percent increase in new and revised data sets. We hope that the agencies who originate these data sets will pay for metadata development, since that would be consistent with Executive Order 12906. Vendor contributions of software also would be more likely under a vibrant SARIS development scenario, thus the total amount of funding needed from SAMAB for the high scenario probably would be in the \$130k to \$150k range.