TIWG Earth Science Information Systems Capability Vision
New Information System Capabilities

Empower scientists who would otherwise be working in isolation

Enable linked and ensemble models for improved predictive capability

Connect user friendly analysis tools with global information resources

Collaboration Environments

Identify needed data quickly and easily

Integrated Analysis Portals   **Community Modeling Frameworks**

Provide research tools to derive and infer new information

next-generation analysis and modeling frameworks

Assisted Data & Service Discovery   **Assisted Knowledge Building**

Reduce research algorithm implementation from months to hours

Ensure research priorities and time-crital data needs are met

core capabilities

Interactive Algorithm Development | **Seamless Data Access** | **Interoperable Information Services** | **Responsive Information Delivery** | **Verifiable Information Quality**

Provide confidence in products and enable community data providers

underlying infrastructure

Evolvable Technical Infrastructure

Enable access to data from anywhere

Increase synergy within the Earth science community through service chaining

Exploit emerging technologies quickly

Our vision for Earth science information systems includes five core capabilities that will enable the delivery of next-generation analysis and modeling frameworks. These capabilities will also enable widespread use of intelligent tools that assist users in discovering and interpreting data needed for their particular research, application, or education purpose. The envisioned capabilities will be built on a flexible processing, storage, and communications infrastructure.

Lets take a brief look at the benefits each of these capabilities in turn.

Integrated analysis portals will connect user friendly analysis tools with global information resources. Earth science experts will no longer need a team of computer science experts in order to work with remote sensing data, so they can focus on research, application, and education results.

Community modeling frameworks will enable multiple models to be linked together and joined into ensembles to dramatically improve predictive capability. The ability to easily connect models together not only provides the opportunity to include new parameters needed for improved forecasts, but also enables expert teams to develop specialized and highly optimized models that can be readily used by others.

Assisted data and service discovery will help people identify needed data quickly and easily. These tools will go well beyond today's search tools, and will employ machine understanding of Earth science to recommend the best datasets, science parameters, and information services to fulfill the user's goals.

Assisted knowledge building will provide research tools to derive and infer new information. Like a tireless helper, intelligent tools will sift through vast amounts of data to identify patterns and anomalies that may warrant further investigation.

Interactive algorithm development will reduce research algorithm implementation from months to hours. Using simple drag-and-drop interfaces, researchers will be able to quickly create complex, production-quality algorithms.

Seamless data access will enable users to access to data from anywhere. Remote datasets can be opened from user tools just like local files.

Interoperable information services will greatly increase synergy within the Earth science community by allowing information services from different organizations to be easily used and chained together. Expertise and technical resources can be leveraged in-place rather than having to be replicated.

Responsive information delivery ensures that research priorities are met and enables new uses of Earth science data. Mission critical production processes will be assured reliable delivery of needed datasets even during peak usage periods by the broader community, and applications will be able to obtain, process, and publish data within minutes of collection.

Verifiable information quality helps provide confidence in the wide variety of information products by giving users better insight to the heritage and quality attributes of each. By facilitating the flow of information through the Earth science community, this capability will foster an environment where innovative organizations can offer new information services.

Underlying all of these capabilities will be an evolvable technical infrastructure that allows emerging technologies to be exploited quickly to deliver cutting-edge performance, cost savings, and enable flexible resource allocation to research, applications, and education.

The new capabilities envisioned for Earth science information systems will enable the next generation of research, applications, and education. By removing technical barriers from the path of information users and providing them with intelligent tools to perform their work, we will greatly accelerate the progress of turning data into knowledge and measurably advance the goals of Earth science.