

“EOS Technology Strategy”

EOS Education Project White Paper #1

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The Earth Observing System (EOS) Education Project successfully negotiated with ESRI Inc., an ArcView site license for the State of Montana. The license provides ArcView software and data to all K-12 public schools in state. The first of its kind in the United States, the intent of the site license is to promote Geographic Information System (GIS) education programs in the classroom. The software package is combined with an extensive data package consisting of ESRI's ArcWorld set, EOS mission imagery from NASA and USGS remote sensing platforms, i.e., Landsat 7, and a customized cartographic product related to the Lewis and Clark trail across Montana. Completing the distribution of software and data, the EOS Education Project will be offering online professional development courses through its GIS Distance Learning Program and additional self-guided tutorials provided by ESRI's Virtual Campus. The EOS Education Project's Montana mission is to create an effective national model for GIS education combining the essential components of software access, data provision, and training opportunities.

The deployment of the GIS state license for K-12 public schools in Montana serves as a measurable and necessary step toward a more comprehensive workforce development strategy in Montana. Lagging far behind nationally in per capita income, hourly wages, economic diversification and information technology infrastructure, GIS proficiency provides students with numerous employment opportunities across a broad range of economic sectors and professional paths. GIS services and applications, emergent Internet-based GIS applications, geospatial wireless services (GIS + GPS), and LBS (Location-Based Services, i.e., E-911) already command a multi-billion dollar economic value and numerous industry observers project mid-term explosive growth for GIS-related goods and services. Combined with remote sensing technologies, related image processing, and networked data storage and communication systems, the upward potential for workforce development and per capita income growth is very high. As such, a comprehensive, well-supported, community-based GIS education program associated with the K-12 public education system fosters concrete workforce development opportunities. These expanding opportunities in turn serve as the economic fulcrum for economic development within geoinformation technology economies. The implications are clear. A GIS-enabled workforce possesses the ability to add immediate value to a variety of digital solutions for numerous private and public sector entities and commands the ability to earn medium to high compensation from a variety of geographical locations.

The final component to the EOS Education Project's multistage education strategy focuses upon the powerful convergence of GIS, remote sensing image utilization and interactive web-based applications. Anticipating market-driven expansion in telecommunication infrastructure across both terrestrial and satellite-based systems, networked or point-to-point geospatial analysis represents a revolution in communication, global economic productivity, and advanced solution support systems. To emulate this trend, the EOS Education Project is deploying advanced educational systems that rely upon the generation of map, image and document services. "Map Services" rely upon the interconnection between spatially enabled databases (geodatabase), powerful, medium-class server software, a variety of thin-client applications (JAVA, Active X, Cold Fusion, ASP) and the concept of networked computing. Map services provide the user(s) with advanced GIS applications that are powered by a theoretically vast constellation of networked information systems. Complimenting the map services, "Image Services" rely upon the transmission and interactivity associated with advanced compression algorithms associated with larger raster-based files. Inclusive of remote sensing imagery, it is now possible to share enormous quantities of image information across the globe to a variety of users at low-cost.

Historically, such systems were not available in the public domain until approximately five years ago and have paralleled the explosive growth of the WWW. Image services represent a telecommunications revolution, which is now infiltrating the expanding market of hand-held wireless devices as a means of personal information satisfaction. Finally, "Document Services," a function of scan-to-web technologies, signify the fundamental digitization of billions of page resources archived in countless global repositories. Employing the most advanced scan-to-web solution in existence, the EOS Education Project sees incredible potential given server compression software, native file type encoding, and a browser-based, thin-client for viewing. With 99% of the world's documents existing as paper resources, incapable of relatively instantaneous transmission and viewing, document services provide education systems with unlimited potential across all aspects of operations from library services, to administrative systems, to education curricula.

In sum, the EOS Education Project's strategy involves comprehensive software, data and education solutions related to GIS, the contribution to workforce and resultant economic development scenarios, and the incorporation of interactive Web-based systems consisting of map, image and document services for the emergent global classroom.

Geographic Information System (A Definition):

A geographic information system (GIS) is a computer-based tool for mapping and analyzing things that exist and events that happen on Earth. GIS technology integrates common database operations such as query and statistical analysis with the unique visualization and geographic analysis benefits offered by maps. These abilities distinguish GIS from other information systems and make it valuable to a wide range of

public and private enterprises for explaining events, predicting outcomes, and planning strategies. A GIS focuses upon where something is, what it is, and why it is there.

Discussed Systems:

ESRI's ArcView 3.0, 3.2, 8.0

ESRI's ArcIMS, ArcSDE, and ArcGIS 8.1

Microsoft's SQL Server and Windows 2000 Server

LizardTech's Geospatial Encoder 4.1 – Enterprise

LizardTech's MrSID Image Server 2.0+

LizardTech's Content Server 1.0+ for 2000 Server

LizardTech's DjVU Command Line 3.1

NASA + USGS Landsat 7 ETM+, NASA TERRA, Space Imaging IKONOS II

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