

Software Reuse for Environmental Decision-Making

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NASA remote sensing data contributes to the environmental decision-making capabilities of policy makers and government agencies. Data products, including Level 2 data from missions such as QuickSCAT, MODIS, and the like, are leveraged to create many derived decision-making products, such as snow-water measurements useful for water and resource management at the local, municipal, county, state, and national levels.

Decision-making software includes several distributed components, including Web Mapping Servers (WMS), Web Feature Servers (WFS), and data management services. One of the major assumptions made by decision-making software systems is that the data it visualizes and operates on are cached internally, or locally to the system, and that the data are provided in a standard format, e.g., Base Maps, Elevation, or GeoTIFF files. However, with NASA observational data, the sheer volume of information to cache (and replicate), and the distributed nature of the data, precludes this type of approach outright.

The NASA Earth Science Data Systems (ESDS) Software Reuse Working Group has been actively investigating approaches to leverage existing software components developed for scientific research that could contribute to the development of applications to support environmental decision-making, and to address the issues stated above. We posit that using existing software components from scientific applications when developing decision-making software (such as components for data retrieval, metadata extraction, and data transformation, e.g., from NASA HDF/HDF-EOS to GeoTIFF) will provide significant reduction in costs and schedule, allowing software developers to “bridge the gap” in leveraging NASA observational data to assist environmental decision-making.