DRAFT FOR COMMENT

Guidelines for GIS-Ready Products
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Increased accessibility, usability, and availability of remotely sensed image products is essential if the needs of less technical users such as educators, natural resource managers, policy makers, and the general public are to be met. It is with these goals and users in mind that GIS-ready products and the coordination and guideline concepts suggested here are developed.

This concept note provides background information on what GIS-ready products are, why they are important, and who the target users are, then describes the current situation with respect to their availability. Because more GIS ready products are gradually becoming available, it is suggested that coordination among the providing organizations, captured as product guidelines, will benefit users by simplifying access and usability. A secondary theme to this note, broader than guidelines, is to encourage more data providers to make GIS-ready data products available.

GIS-Ready Products. This imprecise but convenient term refers to georeferenced image products that can be incorporated into a GIS with minimal effort. They utilize simple, common formats that do not require sophisticated, specialized software, but rather can be viewed with common software such as browsers, IrfanView, PowerPoint, or of course any GIS software. Although a range of products of varying complexity can be considered "GIS-ready", here the focus is on the simple end of the spectrum with a focus on meeting the needs of less-technical users. And while jpeg images have many advantages, such as small size, any common format would probably be suitable. GIS-ready products are most commonly surface images from optical sensors like Landsat, but radar images, digitized maps, and atmospheric products such as profiles are also possible.

Cost. Because GIS-ready products are derived from existing scientific products, the algorithms for generating them are simple and easy to code, and generally not a cost consideration. Thus most of the cost of adding these is the marginal cost of extending the system to offer a new product, a cost that will vary depending on the system.

Target Users. GIS-ready products are for any user that can benefit from easy access to images that otherwise would utilize complex formats geared towards remote sensing specialists. These complex formats include, for example, HDF, or any multi-band format that requires knowledge of image processing to compose an image. Target users need not be GIS experts, use GIS software, or even know what GIS is. Because GIS-ready products can be viewed with simple, common software they greatly increase access to and usability of scientific data products—and thus the value that can be extracted from those products. The number of users interested in GIS-ready products far exceeds the number of traditional scientific users.

Current Situation. No-cost access to the vast data stores of remotely sensed data has been gradually increasing. All NASA EOS data, starting with that coming from the Terra spacecraft,

have been freely available, at no cost, since the first data reached the ground in 2000. Creation and availability of the Landsat Global Land Survey (GLS) products in 2000 was another big step forward. TerraLook increased access to the GLS and NASA Advanced Spaceborne Thermal Emission and Reflection (ASTER) archives by making images available as georeferenced jpegs starting in 2007. Eliminating user charges for the entire Landsat archive, which USGS did in 2008, was another (very) big step forward for open access. Brazil and China now provide greater access to the images in the CBERS archive, and India recently updated their data policy so that all images coarser than 1m are now accessible. However, although there is a trend towards increased accessibility, there are still huge volumes of data that are not accessible.

What Happened with ASTER. Although the Earth Remote Sensing Data Analysis Center (ERSDAC), which oversees the ASTER dataset, charges for the full multi-band product, TerraLook encouraged ERSDAC to make their products available at no cost as georeferenced jpegs, thus opening up the entire ASTER archive, currently about two million images, to everyone. ASTER is now available to a much broader range of users than the highly specialized scientific audience that is the primary target for most sensors. Because GIS-ready products cater to a different audience than the specialized scientific one, the increased access provided by GIS-ready products does not decrease the sales of the full product; in fact, it may increase sales by increasing visibility and interest. This is an important point; one rationale for greater coordination among data providers and for establishing guidelines for GIS-ready products is to increase visibility and encourage more providers to consider offering them.

As more GIS-ready data products become available there is the possibility that they will be offered in a multitude of formats or with incomplete or parochial metadata. Such a divergence would stymie accessibility and decrease the value to users as well as the value extracted from the data. Such a scenario can be avoided by simple coordination among data providers to make GIS-ready products more consistent. Once a data provider has decided to offer GIS-ready products, consistency does not impose any incremental costs.

Unlike the target audience for full scientific products, the users for GIS-ready products do not have a wide diversity of needs—this fact makes convergence towards a limited number of formats possible. But since such convergence is unlikely to emerge on its own, as a first step forward to facilitate coordination, it may be wise to propose a set of guidelines. These guidelines could cover issues such as:

- Format (recommended formats might include: jpeg with World file, tiff with World file, geotiff)
- Metadata format: xml
- Metadata content: This could have several levels of detail but the most basic information would perhaps include:

- o   Location (eg, four corners)
- o   Coordinate System
- o   Datum
- o   Date and time of acquisition
- o   Sensor name

The guidelines could include information to limit the number of coordinate systems used to enhance compatibility with common software. Additional metadata might include a shapefile of the image footprint, a small thumbnail image, actual corners of the image to help eliminate black borders, sensor parameters, details of data processing, etc. Note that the goal here is not to try to create a new standard, but rather to coordinate formats and metadata, using existing standards.

Regardless of the details, however, it is essential to remember that simplicity is critical--while options may add flexibility they also add complexity. Most of the target users do not want or need to make many choices because their needs are simple, so if options are deemed necessary they should be hidden from the mainstream user.