ScienceBase Item Extensions

The ScienceBase Item Core Model describes the metadata elements that make up the core of ScienceBase and apply to every item. Extending this model are ScienceBase Item Extensions that add additional attributes to items based on specific needs. Some extensions are created to accommodate particular metadata standards in use for particular types of items. Others are generated when a new ScienceBase Harvester is established to pull in a particular information source with unique information.

To some extent, extensions are artificial constructs of convenience in that any ScienceBase Item can really have any collection of attributes across any extensions. For instance, there is a Project Status element that applies to both a generic Project extension and the very specific BASIS+ extension used to accommodate information from an internal USGS system that shares data with ScienceBase. It is the same attribute with potentially different values applied under the auspices of two different extensions. The extension construct helps to provide some logical grouping and meaning to item attribution.

The following pages discuss current ScienceBase Item Extensions in some detail, laying out the sbJSON constructs and providing information on any applicable metadata standards or code lists used to inform their attribution.

- **ArcGIS REST Service Extension** — The ArcGIS REST Service Extension provides necessary connection information to ArcGIS services for interaction in ScienceBase.
- **BASIS+ Extension** — BASIS+ is an internal USGS system used for managing budget and allocation for science projects and other USGS activities. BASIS+ summary information is harvested and aggregated into ScienceBase to support discovery and planning for science in the organization. BASIS+ information access is limited to USGS employees.
- **Budget Extension** — Budgeting information can be attached to items which track data such as total funds, direct or indirect costs and multiple annual budgets for individual years.
- **Citation Extension** — ScienceBase regularly brings in citations of various types through harvests and information uploads specific to communities. Future work will involve better integration and federation with external citation systems such as Google Scholar, Mendeley, and others as opposed to actual harvesting of records into ScienceBase. However, there will almost always be the need for some number of basic citation type items in ScienceBase.
- **Community Extension** — This defines an Item as a Community in ScienceBase-Catalog and is best managed using the edit form in ScienceBase-Catalog
- **ESRI Map Package Extension** — Deprecated - Do not use.
- **ESRI Service Definition Extension** — The service definition extensions provides the support for ArcGIS .sd files. Uploading an SD file to an item creates this extension and if the item is public a service is created on the ScienceBase ArcGIS server.
- **Geology Extension** — A simple Geology extension with one lithologic comment field.
- **GeoProcessing Service Extension** — Geoprocessing services contain geoprocessing tasks, and a task takes simple data captured in a web application, processes it, and returns meaningful and useful output in the form of features, maps, reports, and files.
- **Monitoring Protocol Extension** — This extension describes data from the former Natural Resource Monitoring Protocol (NRMP) database.
- **NetCDF OPeNDAP Service Extension** — ScienceBase can harvest NetCDF data using the OPeNDAP protocol directly from a qualified URL within this extension. NetCDF (network Common Data Form) is a set of interfaces for array-oriented data access and a freely http://www.unidata. ucar.edu/software/netcdf/copyright.html distributed collection of data access libraries for C, Fortran, C++, Java, and other languages. The netCDF libraries support a machine-independent format for representing scientific data. Together, the interfaces, libraries,
- **NGGDPP Collection Extension** — The National Geological and Geophysical Data Preservation Program (NGGDPP http://datapreservation.usgs. gov/) is a collaboration between the USGS/DOI and the Association of American State Geologists to catalog and preserve valuable geoscience collections throughout the agencies. ScienceBase provides the infrastructure for the National Digital Catalog, housing collection records and the items within those collections on behalf of the State Geological Surveys. The NGGDPP Collection Extension provid
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- **OGC Web Service Extension** — ScienceBase connects to a number of different Open Geospatial Consortium web services that require several distinct attributes that describe aspects of the services and how they can be connected to and interacted with in ScienceBase. These attributes are contained within a generalized OGC extension that is further classified with a Web Service Type list.
- **Paleo Extension** — This extension is used to describe data from the USGS National Paleontological Database.
- **Project Extension** — This defines an Item as a Project in ScienceBase-Catalog.
- **Raster Extension** — The Raster Extensions supports raster image files such as GeoTIFFs. With this extension, a spatial service will be enabled for the GeoTIFF. This extension is created with a raster file is uploaded to an Item.
- **Shapefile Extension** — The Shapefile Extensions provides the support for ESRI shapefiles files. A ESRI 'shapefile' is a bundle of files with the same base name but with different extensions - *.shp, *.dbf, *.prf, *.shx, *.shp.xml, etc. When a shapefile is uploaded in the ScienceBase Catalog UI, this extension is created as well as a corresponding spatial service.
- **Stratigraphy Extension** — Stratigraphy is a branch of geology which studies rock layers (strata) and layering (stratification). It is primarily used in the study of sedimentary and layered volcanic rocks. Stratigraphy includes two related subfields: lithologic stratigraphy or lithostratigraphy, and biologic stratigraphy or biostratigraphy.

> ⚠ You may find ScienceBase documentation occasionally that uses the word, facet, to describe what we call extension here. We originally used facet to describe this aspect of the architecture because of the use of that term in the underlying database technology for ScienceBase (MongoDB). However, we adopted the use of ScienceBase Item Extension to describe the concept for clarity with the Search Facet concept discussed elsewhere in the documentation.