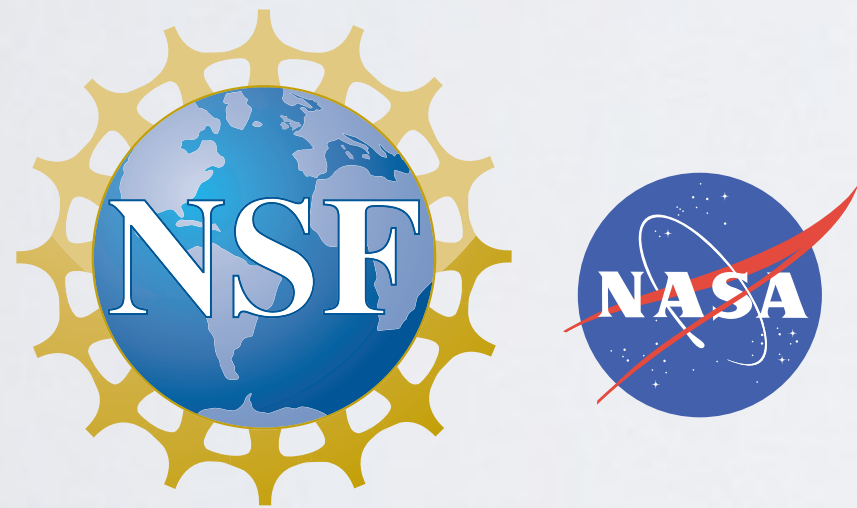


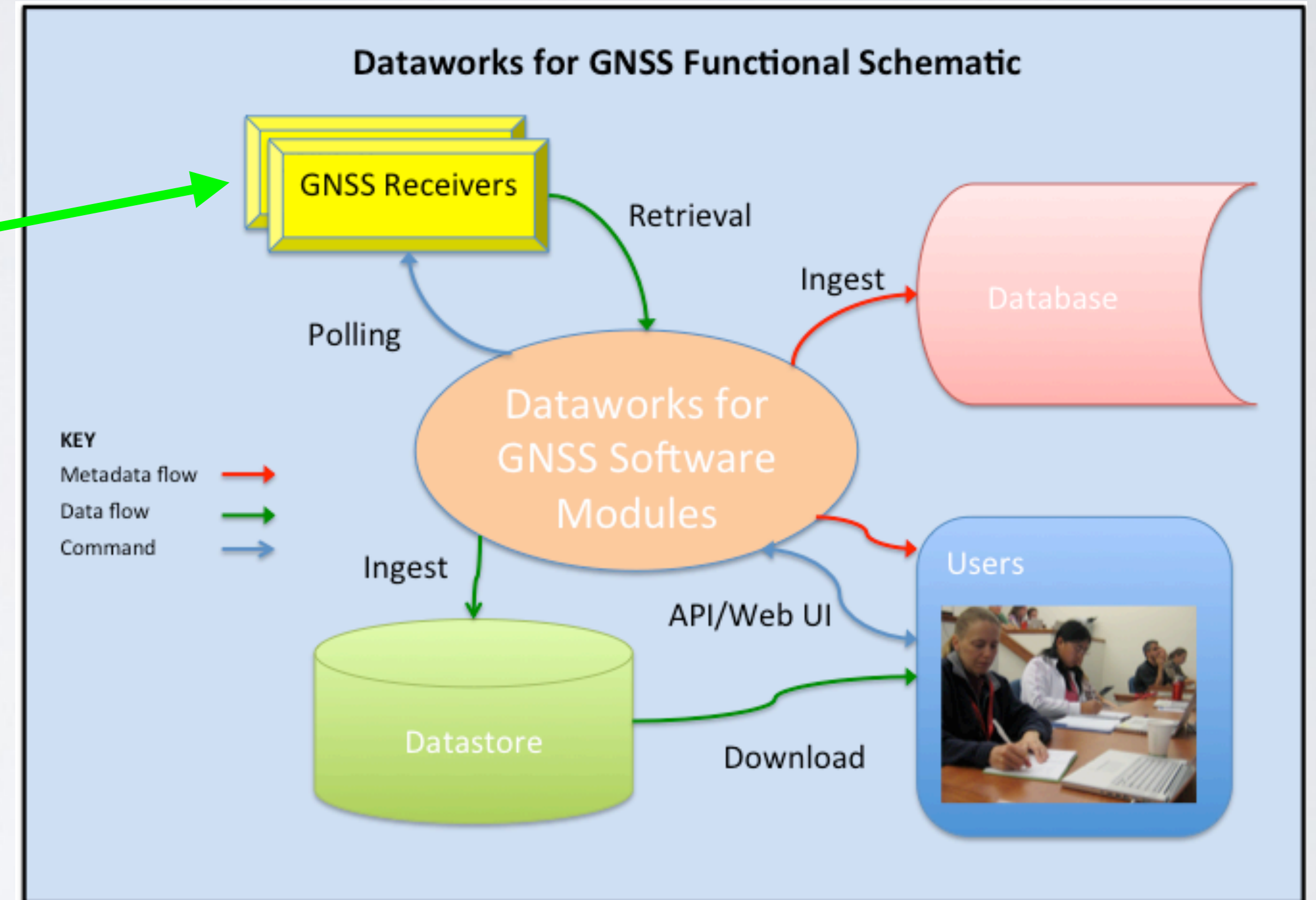
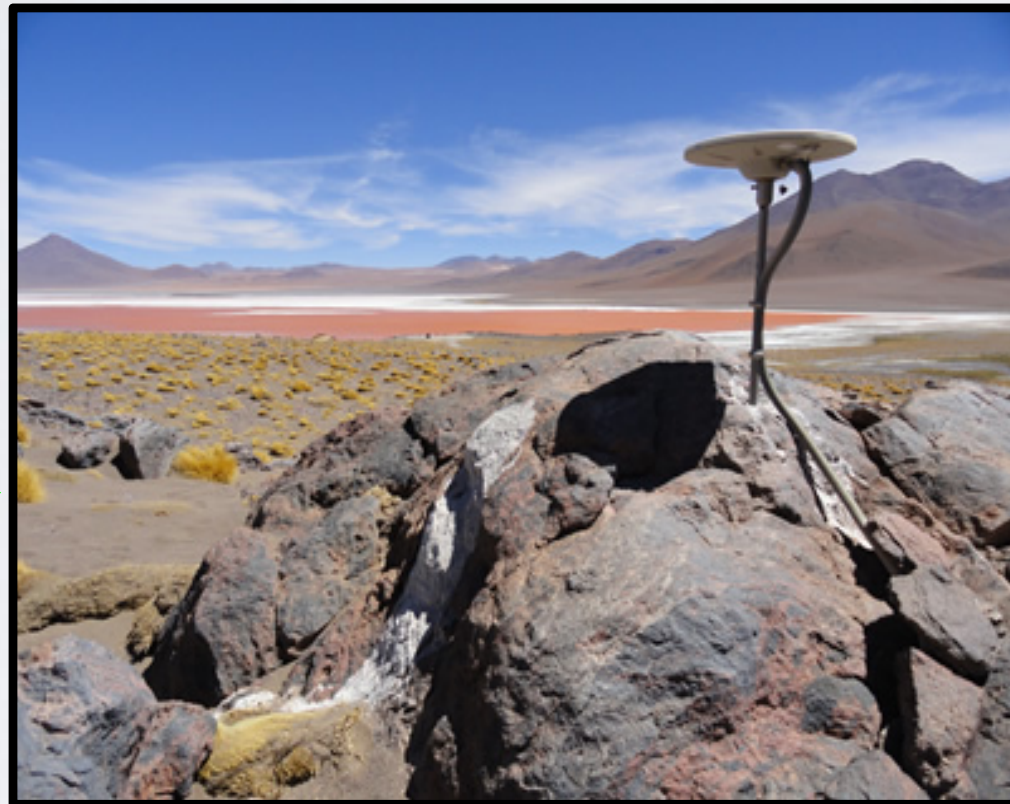
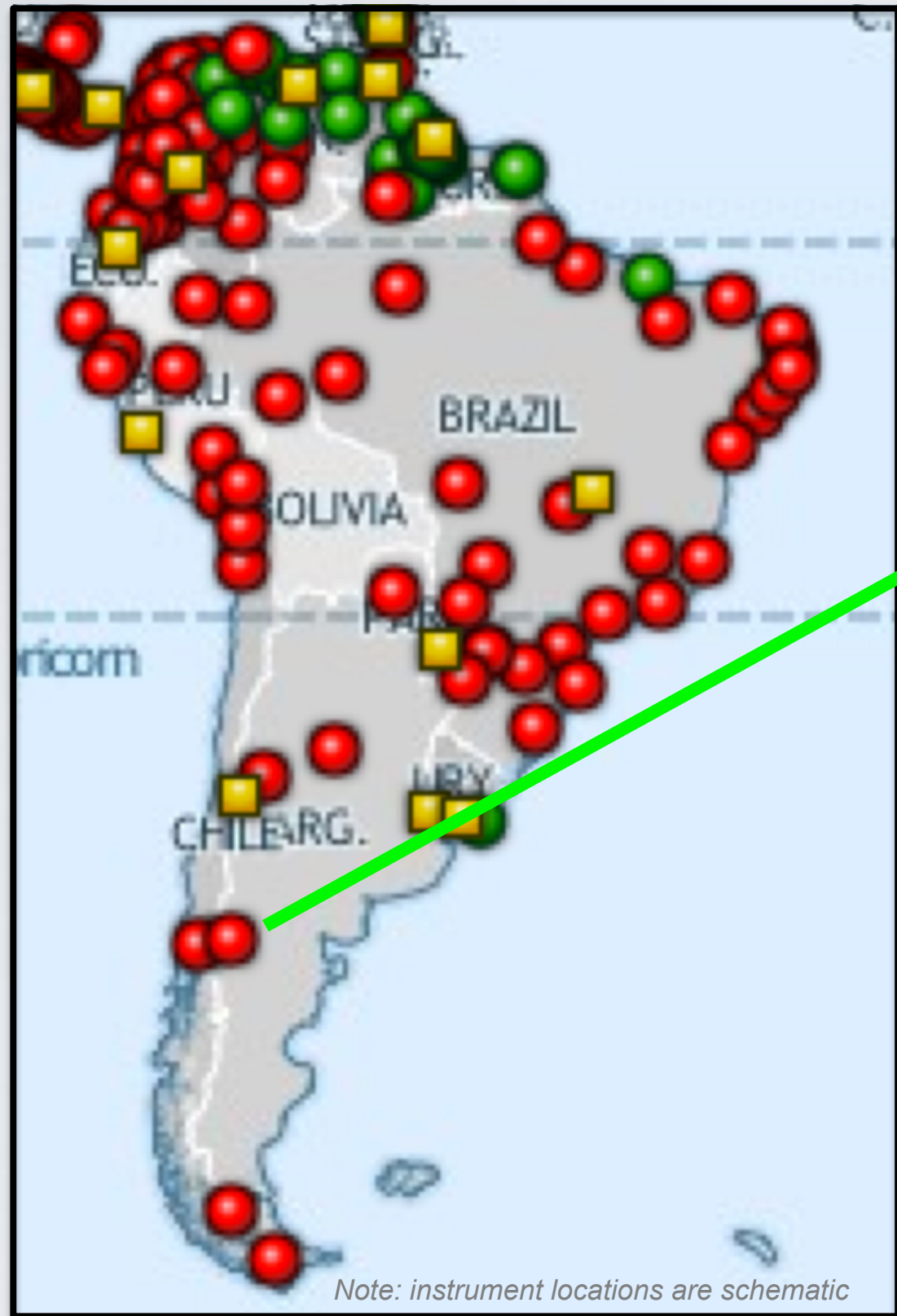
UNAVCO

DATAWORKS FOR GNSS - DATA
MANAGEMENT SOFTWARE FOR
REGIONAL NETWORKS
GNLA WORKSHOP
MAY, 2015



Fran Boler, Chuck Meertens, Stuart Wier, Mike Rost,
and James Matykiewicz

DATAWORKS FOR GNSS



Dataworks provides data management and distribution software subsystems as open source modules that can be employed by regional GPS/GNSS managers for small to medium scale networks (e.g. 10-100 stations).

MOTIVATION AND FUNCTIONS

Motivation

Recognizing that many organizations operate GNSS stations but do not have the expertise to write their own software systems for the fundamental tasks of GNSS data and metadata management, UNAVCO created Dataworks for GNSS. These software modules are intended to keep the tasks of handling incoming data, ingesting, metadata storage, and presentation to the users manageable for smaller institutions. UNAVCO's development of Dataworks was supported by NSF funding to COCONet for Regional Data Centers.

Functions

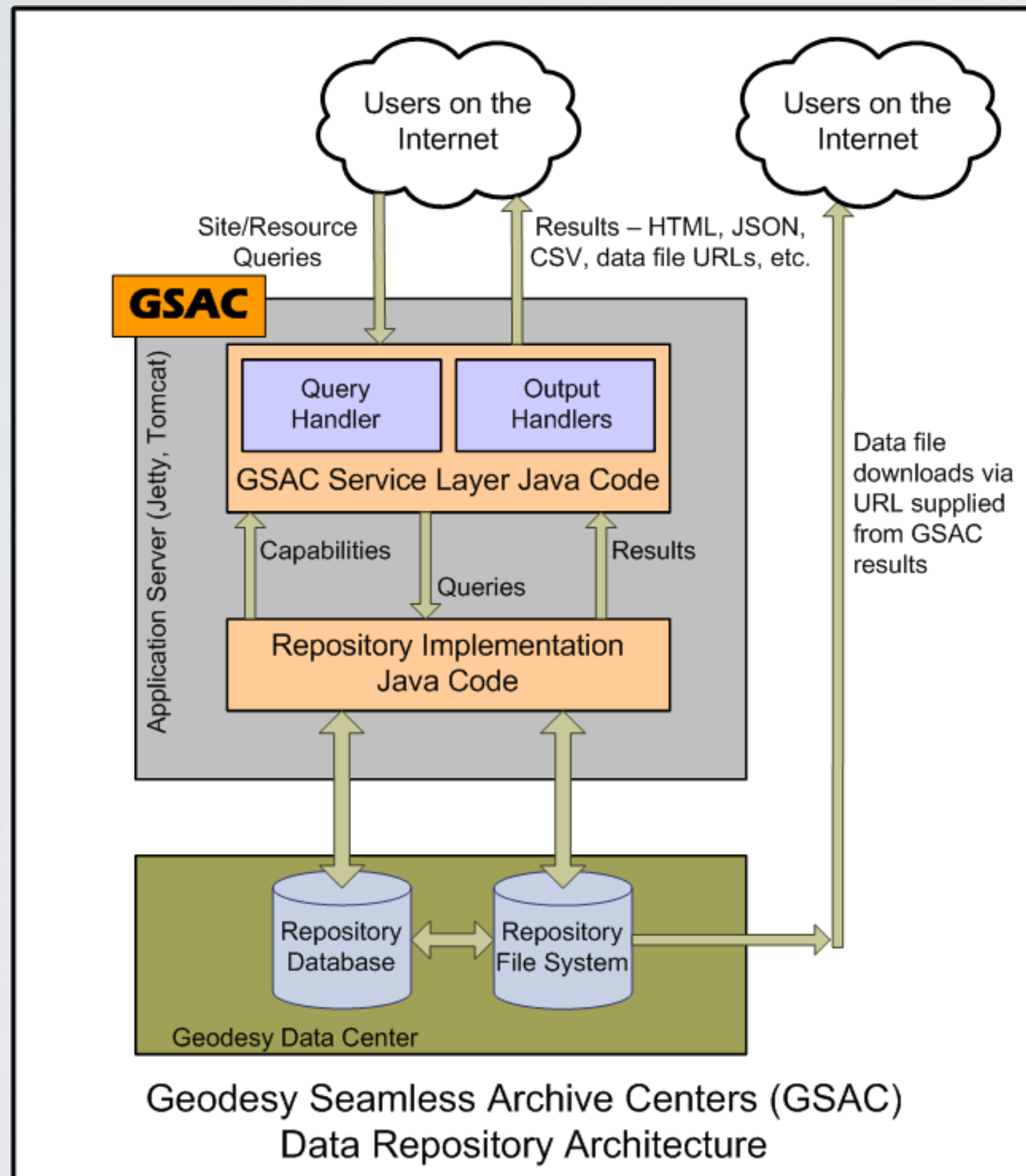
- Handle Incoming Data
- Extract Metadata
- Maintain Database of Metadata
- Data Stored and Backed-Up
- Data and Metadata Distribution Web User Interface
- Web Services
- Mirroring and Federation Options

GEODESY SEAMLESS ARCHIVE

GSAC (Geodesy Seamless Archive Centers)

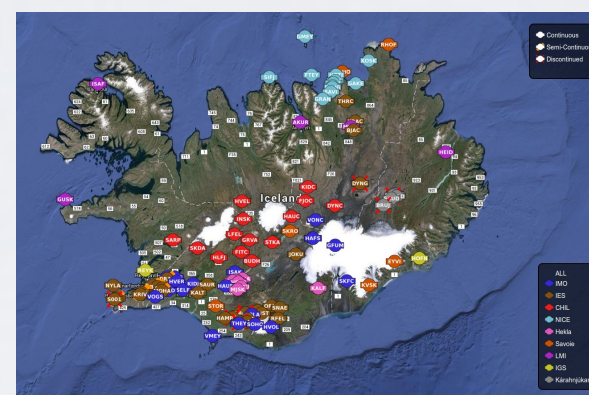
- built to enable simplified search across archives
- implemented in Java
- uses uniform web services, enables federation
- built by partners UNAVCO, SOPAC, CDDIS
- NASA ACCESS funding 2010-2012
- NSF funding 2013-2014
- adopted in Europe by EPOS
- installations in Europe revealed lack of software infrastructure
- GSAC prototype database initiated

GSAC has been installed at 8 centers in Europe

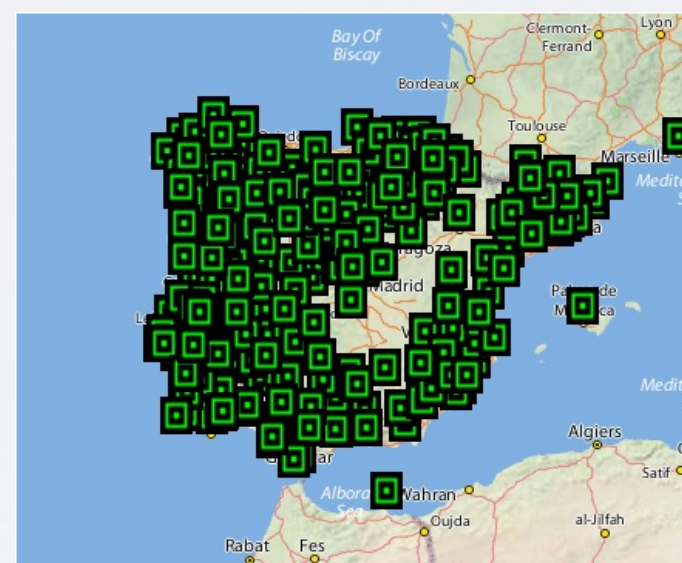


GSAC AND EPOS IN EUROPE

Up-to-date listing at UNAVCO	http://www.unavco.org/software/data-management/gsac/repositories/repositories.html
INGV, Italy	http://bancadati2.gm.ingv.it:8081/gsacring/gsacapi/site/form
RENAG, France	http://webrenag.unice.fr/gsac/
National Observatory of Athens, Greece	http://194.177.194.238:8080/noanetgsac/gsacapi/
FreDNET, Italy	http://158.110.30.116:8080/gsacogs/



Iceland

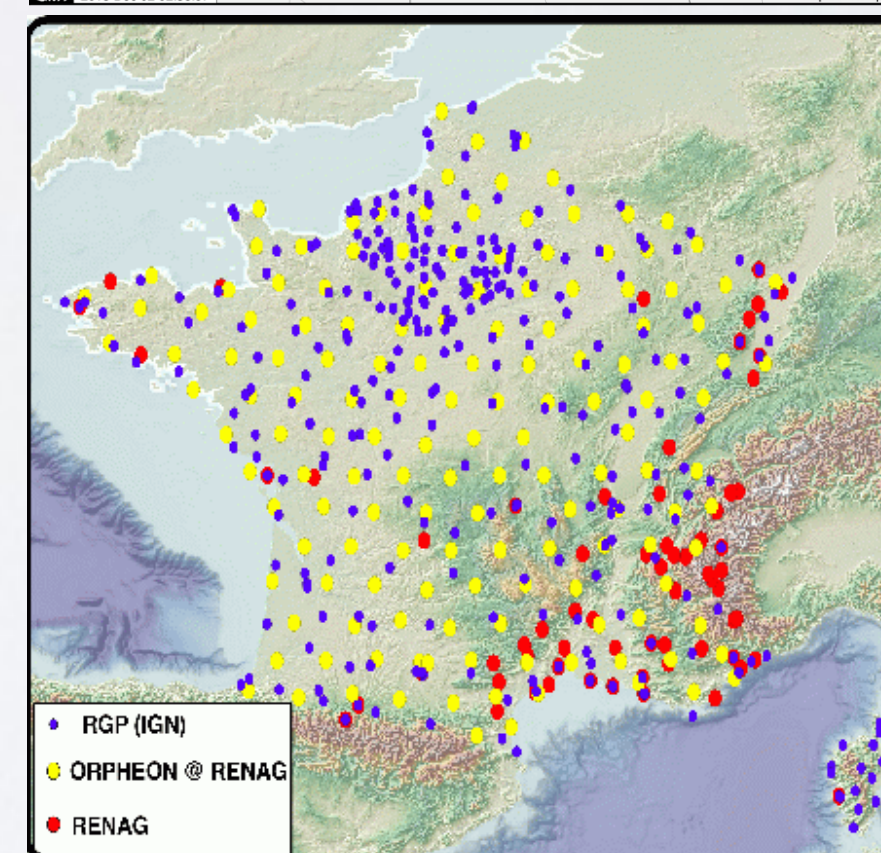
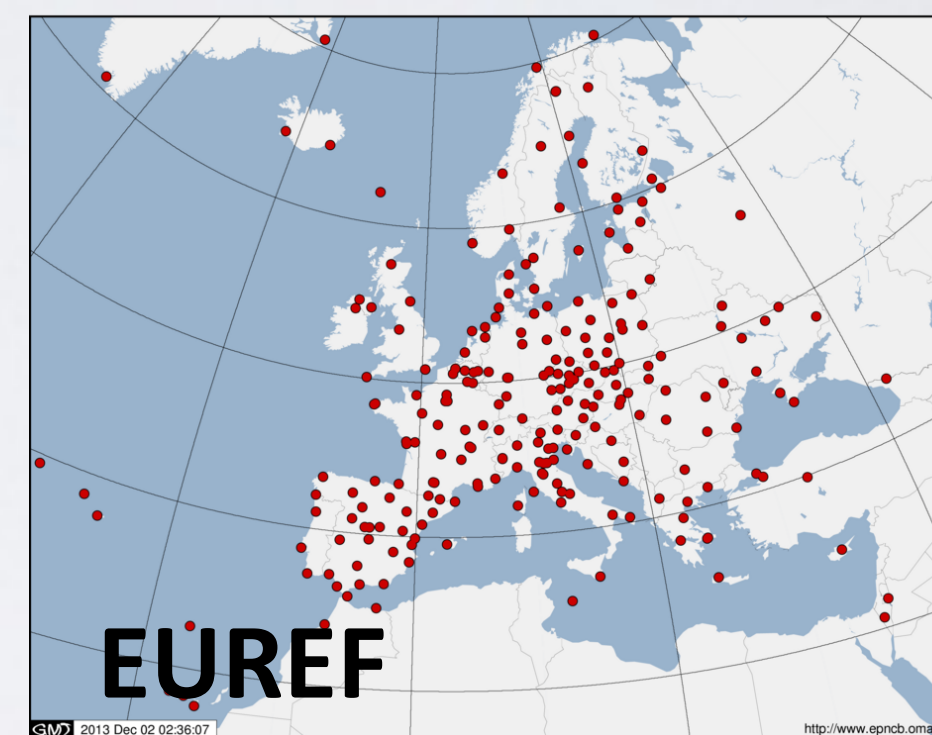


Iberia



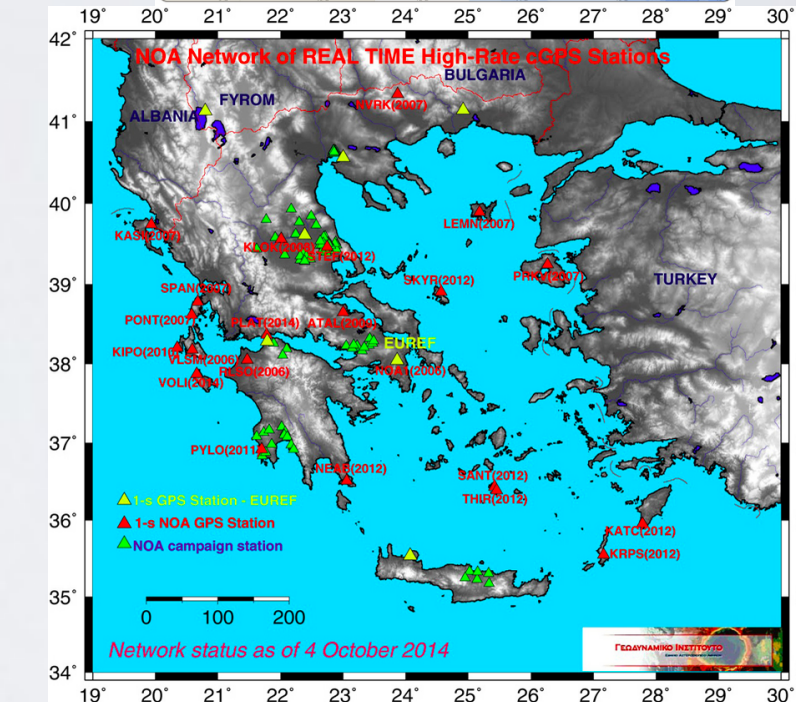
Implementations of GSAC in Europe

EUREF Permanent Tracking Network

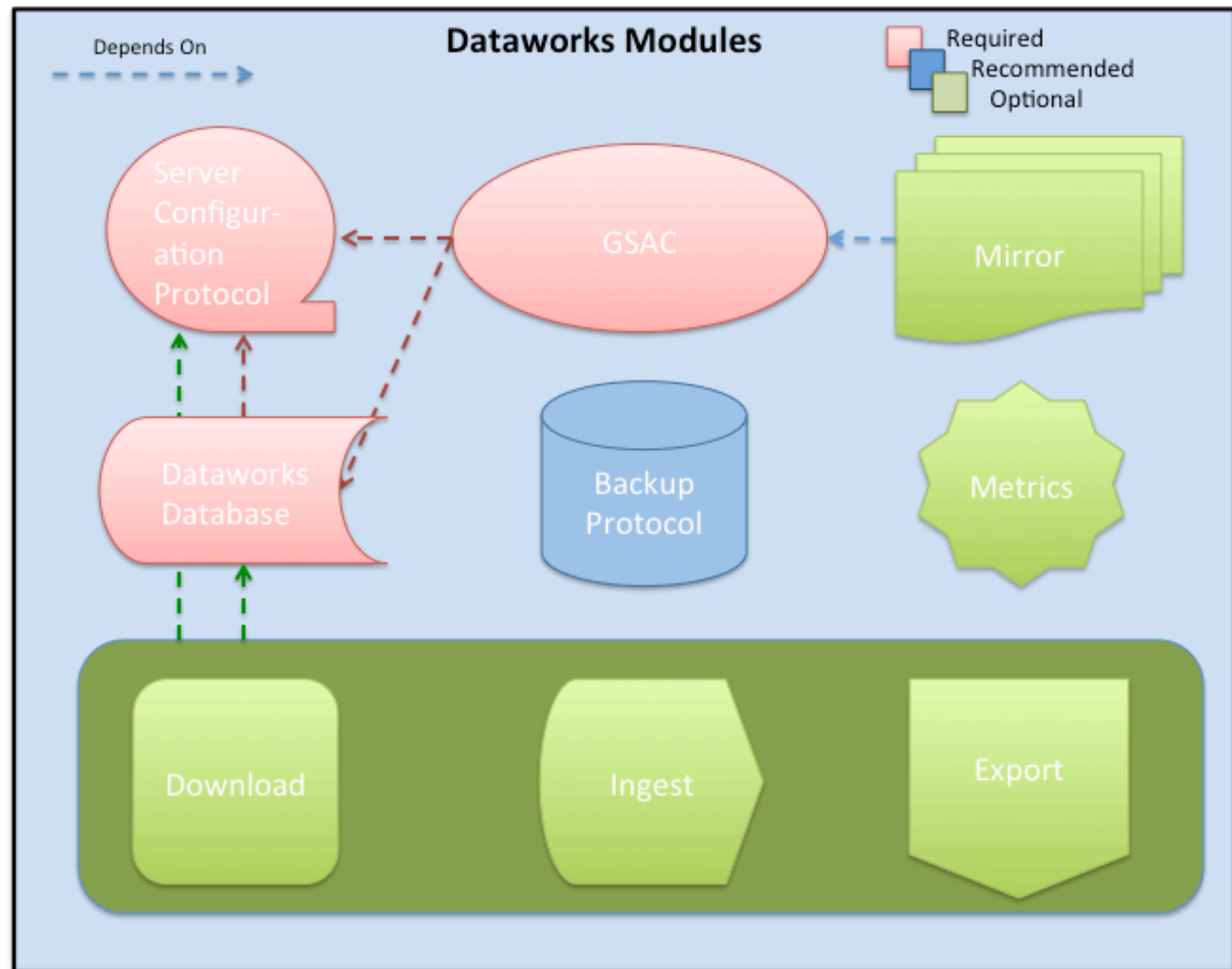


RETE INTEGRATA NAZIONALE GPS

<http://ring.gm.ingv.it>



DATAWORKS MODULES



Required:

- Specified OS (CentOS Linux) and Services (e.g. Tomcat, FTP)
- Dataworks Database Schema running on MySQL
- GSAC (Geodesy Seamless Archive Centers Software)

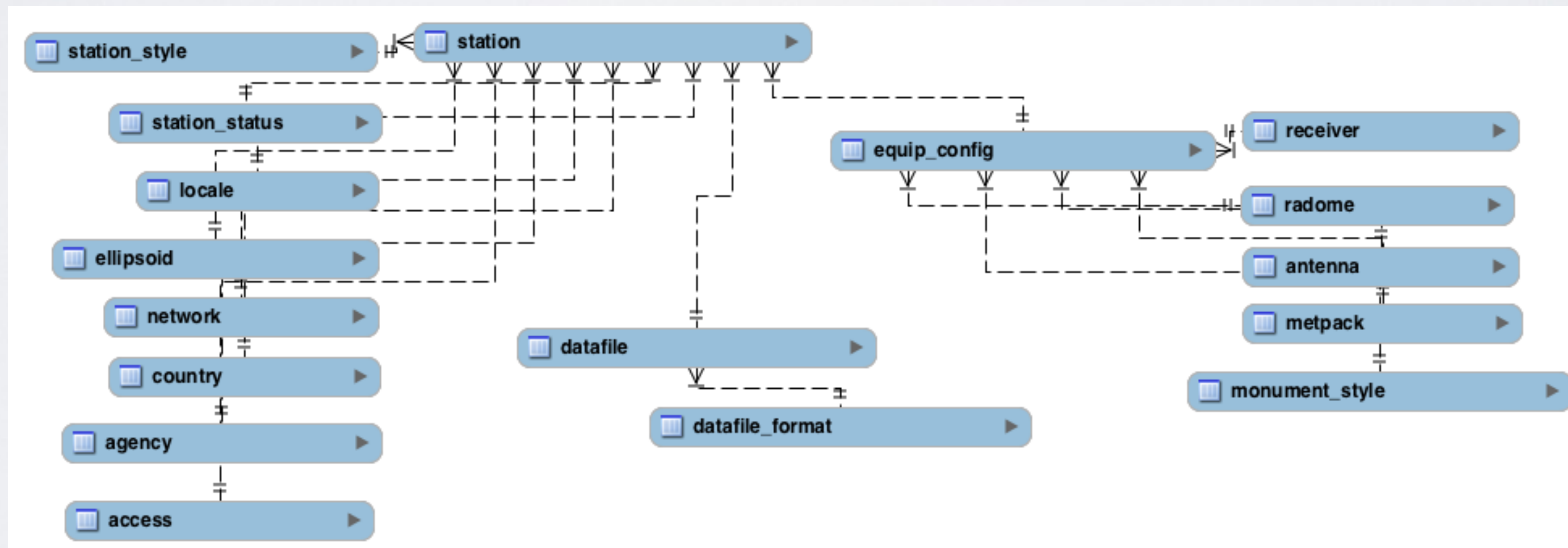
Optional:

- Mirroring (from partner data centers)
- Receiver download and associated data management
- Metrics and Backup

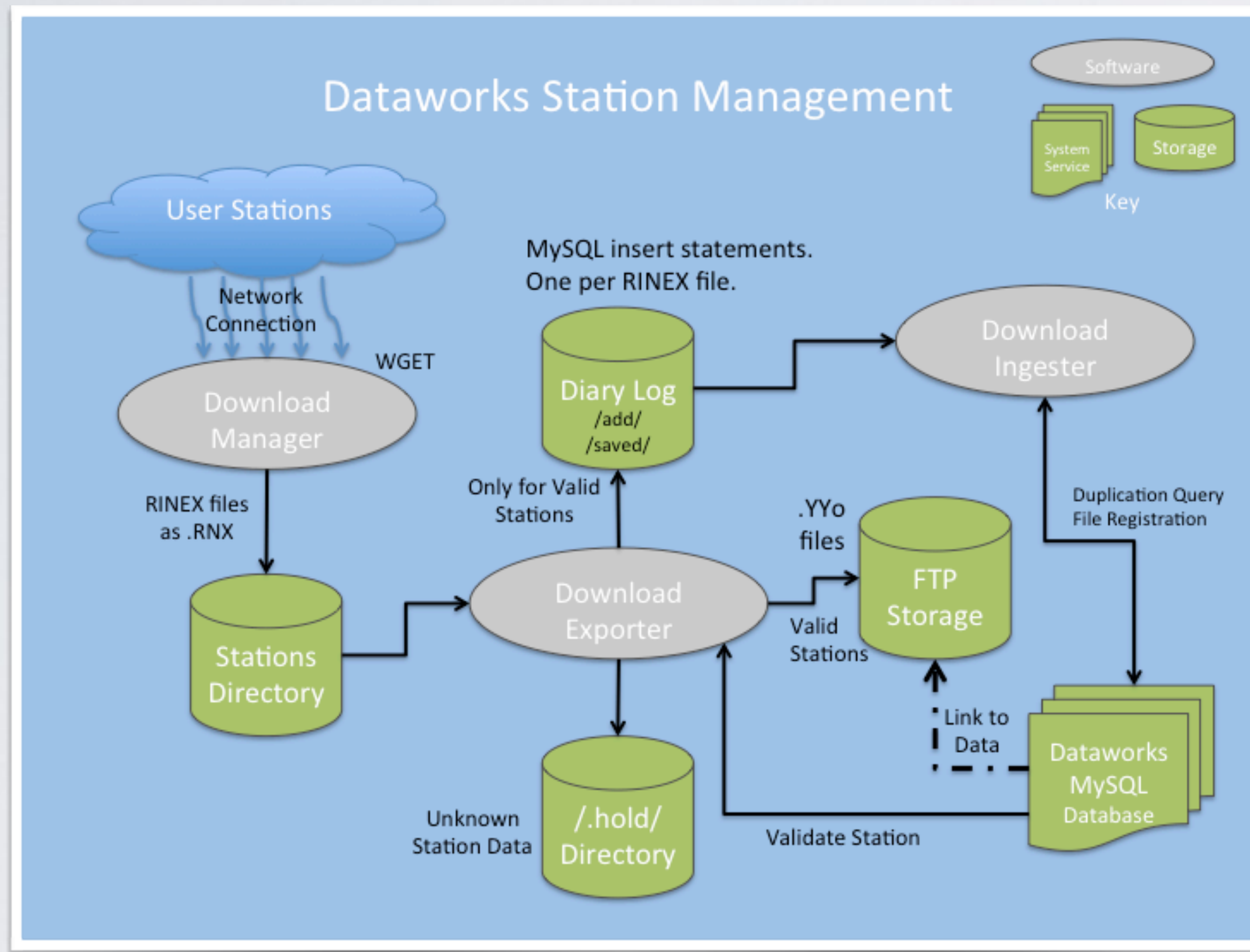
DATAWORKS DATABASE

Database schema

- purpose-built for Dataworks
- evolved from GSAC prototype database schema
- fundamental tables: station, file, equip_config
- lookup tables aid maintenance, clean metadata



RECEIVER DATA MANAGEMENT

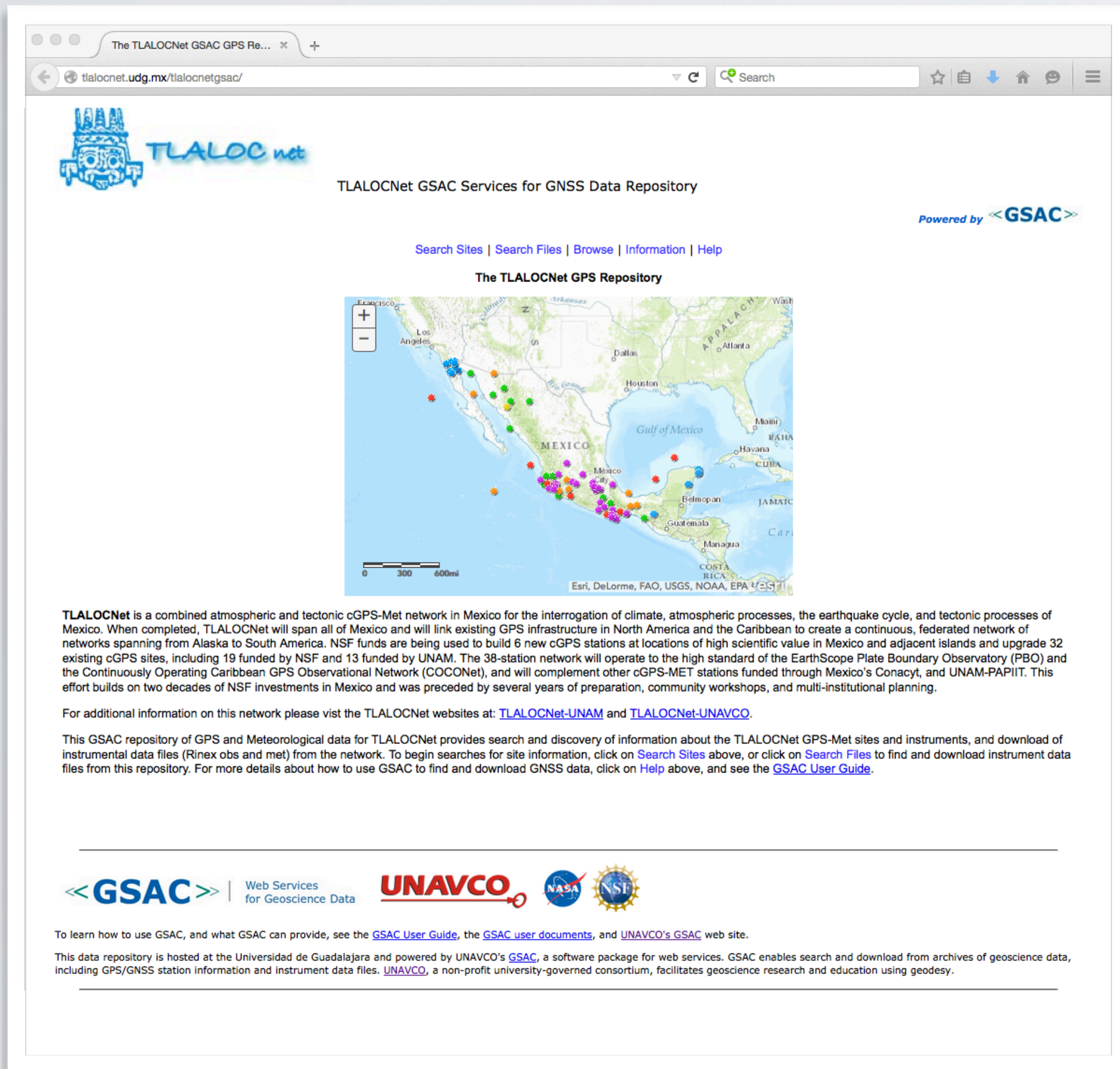


Python Modules

- downloadManager
- downloadIngestor
- downloadExporter

These modules download files from remote receivers and manage interaction with GSAC through Dataworks database (ingest metadata), storing in local ftp server for distribution

REGIONAL DATA CENTERS



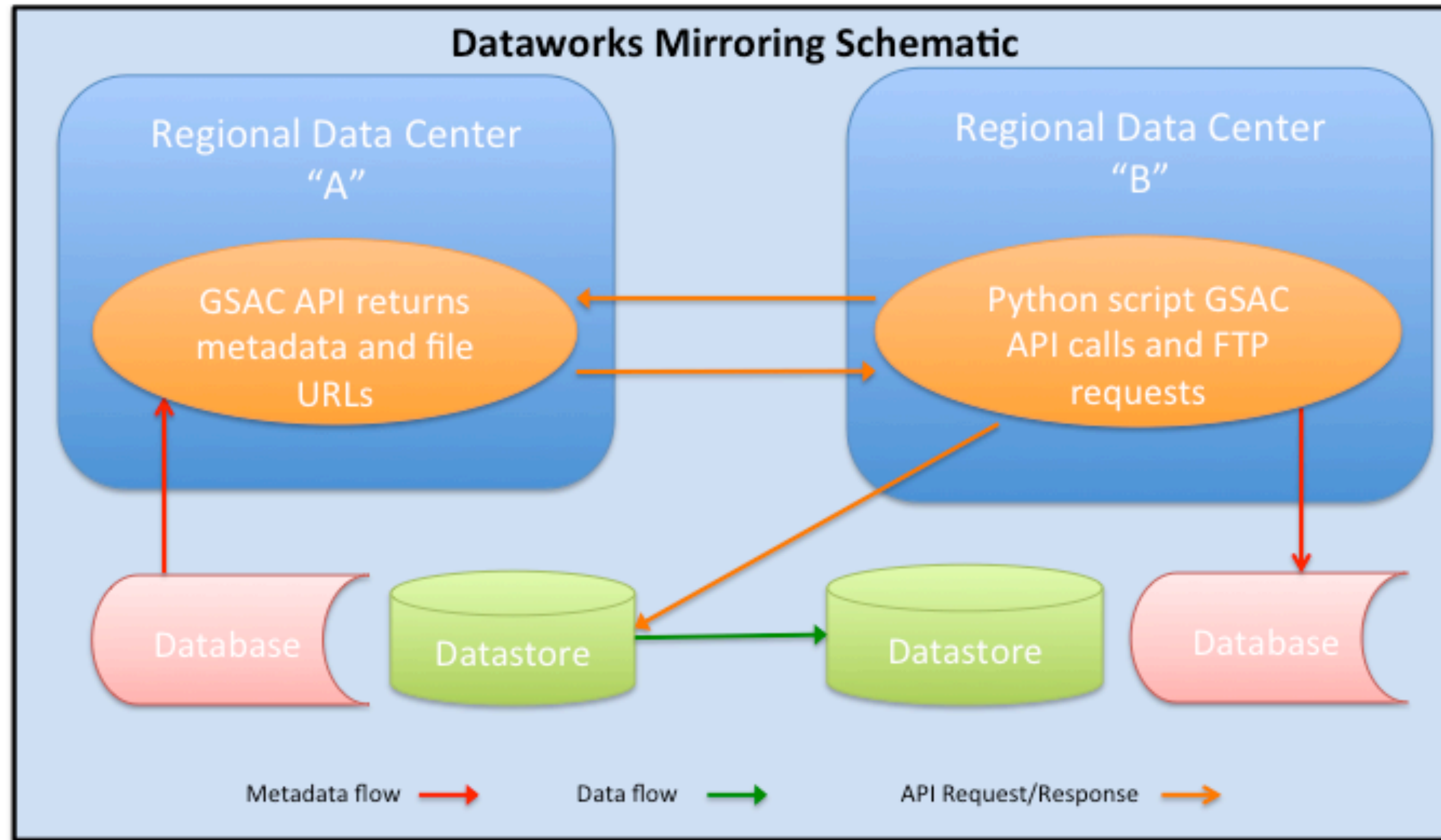
COCONet Regional Data Centers running Dataworks:
 Geological Survey of Colombia (SGC)
 CIMH Barbados
 INETER, Nicaragua

Selected from proposals submitted to RFP

TLALOCNet Regional Data Center running Dataworks
 Universidad de Guadalajara / UNAM

- Server with Dataworks installed by UNAVCO delivered to each center
- Training in Dataworks at UNAVCO

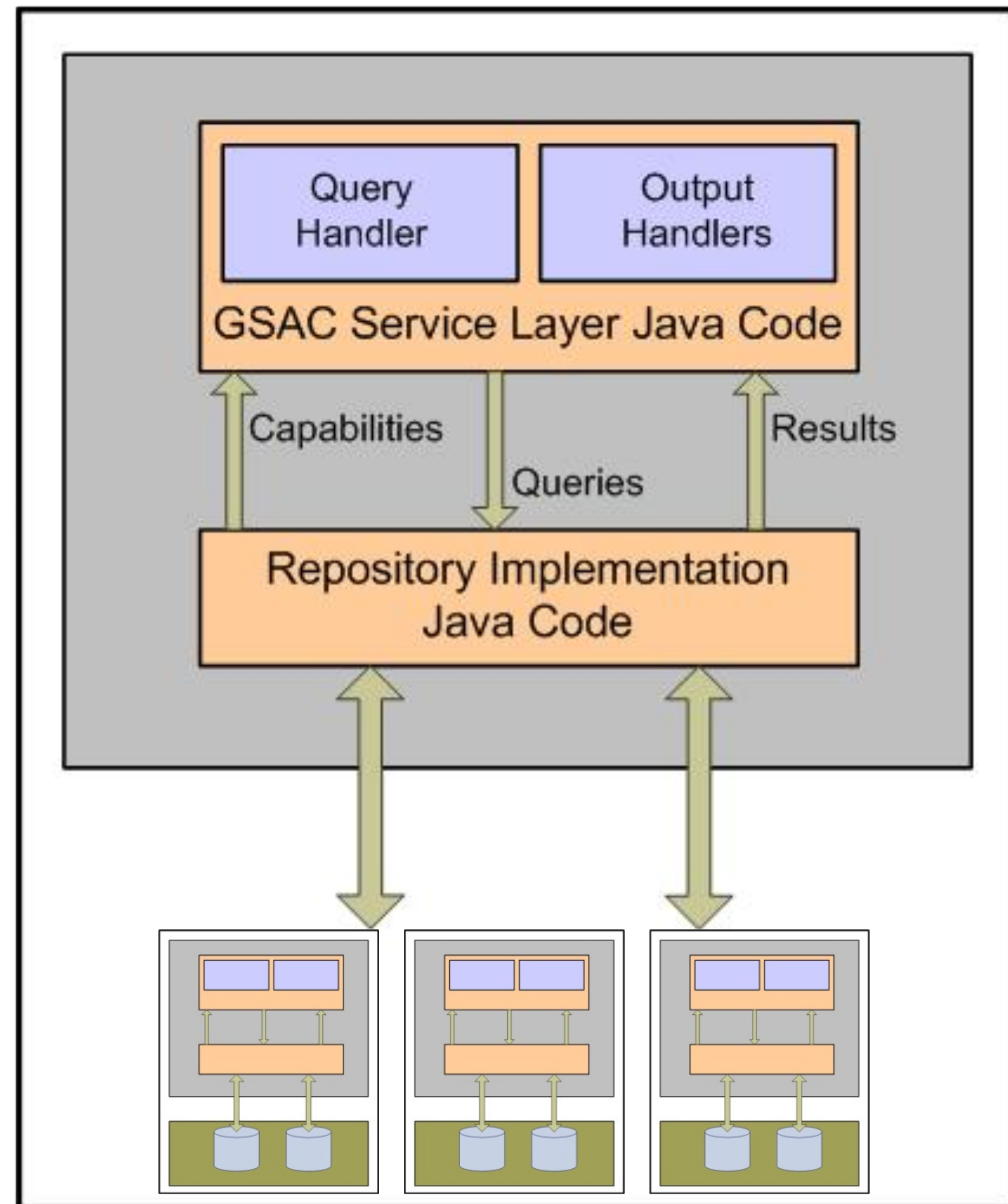
DATA & METADATA MIRRORING



Facilitates data sharing across regional networks with individual data centers having responsibility for part of the network

Used at COCONet and TLALOCNet Regional Data Centers to Mirror UNAVCO holdings from COCONet or TLALOCNet sites

DATA & METADATA FEDERATION



Facilitates data search across regional networks with individual data centers having responsibility for part of the network

Used among US Data Centers (SOPAC, UNAVCO, CDDIS)

UNAVCO

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Software

- Help with Software
- **Data Management**
 - GSAC
 - **Dataworks for GNSS**
 - Database Schema
 - GSAC for Dataworks
 - Data Download Module
 - Data Mirror Module
 - Backup Recommendations
 - Metrics Module
 - Server Setup
 - Software Repository
 - Dataworks FAQ

Dataworks for GNSS

Dataworks, a work in progress, provides subsystems as open source software modules that can be employed by regional GNSS managers for small networks (e.g. tens of stations). Subsystems and modules include GNSS downloading from the receiver and subsequent data management, metadata management using a streamlined database, and data and metadata distribution:

- [Dataworks for GNSS Database \(DGD\) Schema](#) for MySQL dbms
- SiteDataManager: Dataworks for GNSS metadata management User Interface (UI) (*Planned*)
- [GSAC \(Geodesy Seamless Archive Centers\) for Dataworks](#): web and API data and metadata access
- [Data Download Module](#): receiver downloading and local data handling
- [Data Mirror Module](#): mirroring of data and metadata from a GSAC data center and subsequent local data handling
- [Backup Recommendations](#): backups of data and metadata
- [Metrics Module](#): tracking of data ingest and outflow
- [Server Setup](#): preparing a linux (CentOS) server for Dataworks software
- [Software Repository](#): access Dataworks software modules
- [Dataworks FAQ](#): A Dataworks FAQ


Related Link

- [Dataworks for GNSS project](#)

Last modified: Thursday, 14-May-2015 16:59:23 Mountain Daylight Time

May 2015

Dataworks for GNSS: Manual for Data Repositories



UNAVCO

Dataworks web site and documentation

<http://www.unavco.org/software/datamanagement/dataworks/dataworks.html>

FURTHER DEVELOPING DATAWORKS

Development is needed in these areas:

- Improve scalability
- Add tools for operator metadata management
- Add functionality related to realtime
- Expand the receivers and formats of the Download Module
- Add QC and formatting functionality
- Test in a Cloud VM environment and distribute as a VM image
- Sustainable support

Additional development will depend on securing additional resources