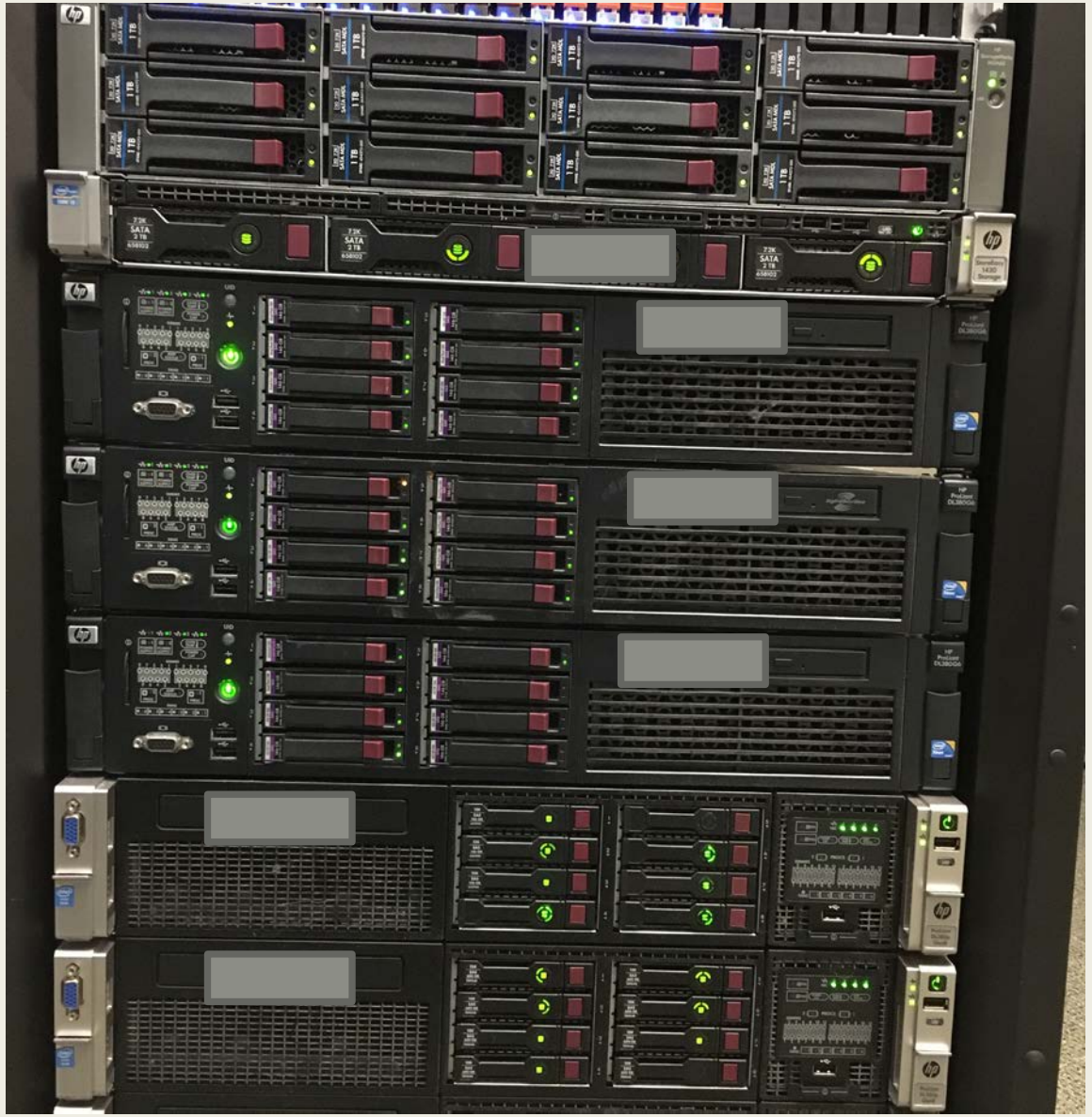
MONTANA

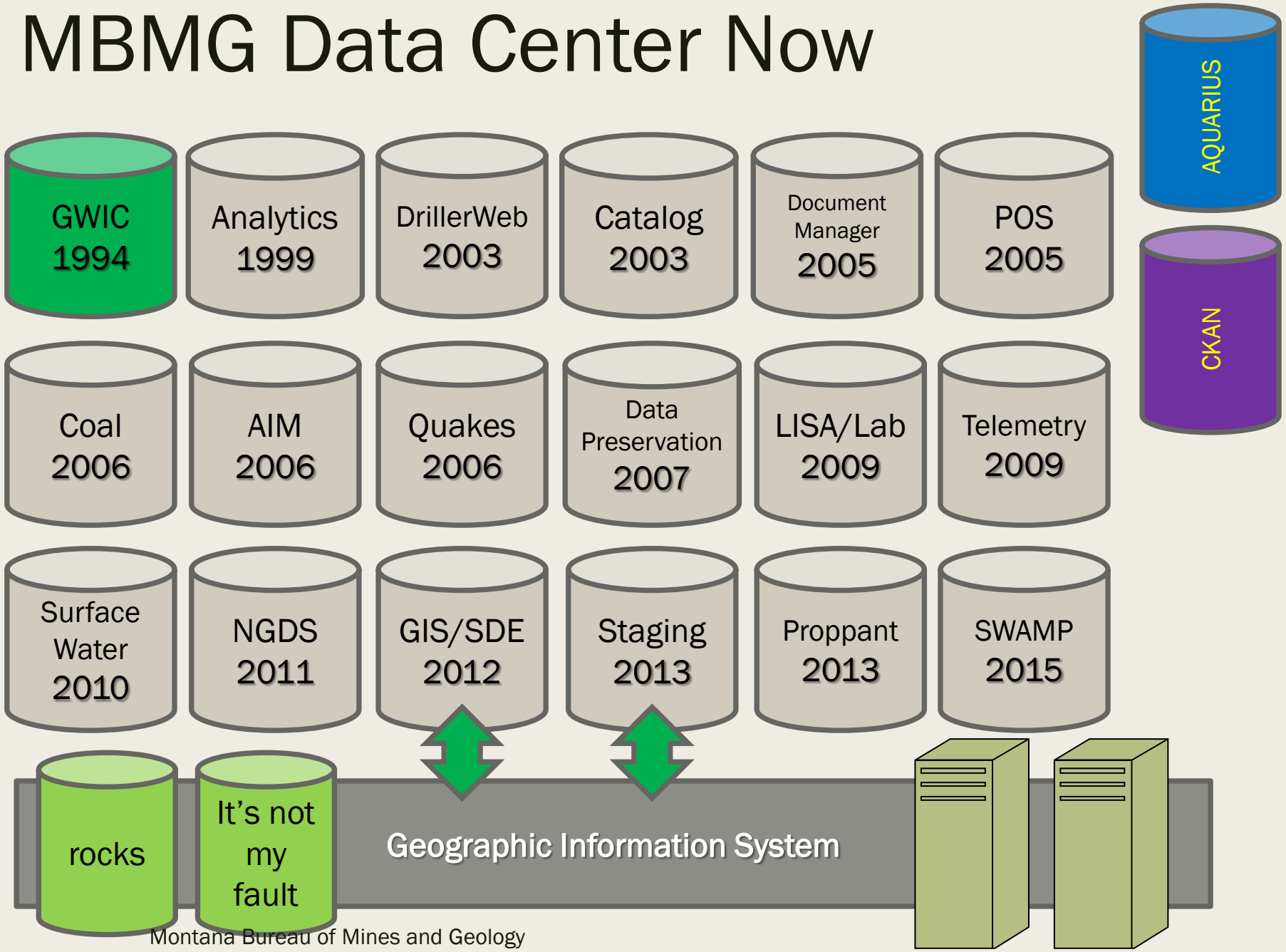
Our participation in NGWMN
From Pilot Stage and Beyond

MBMG IT Infrastructure

- 6 Physical VMWare Hosts
- 28 Virtual Servers
- 2 SANs
- Battery/UPS
- Generator
- Campus Connection



MBMG Data Center Now

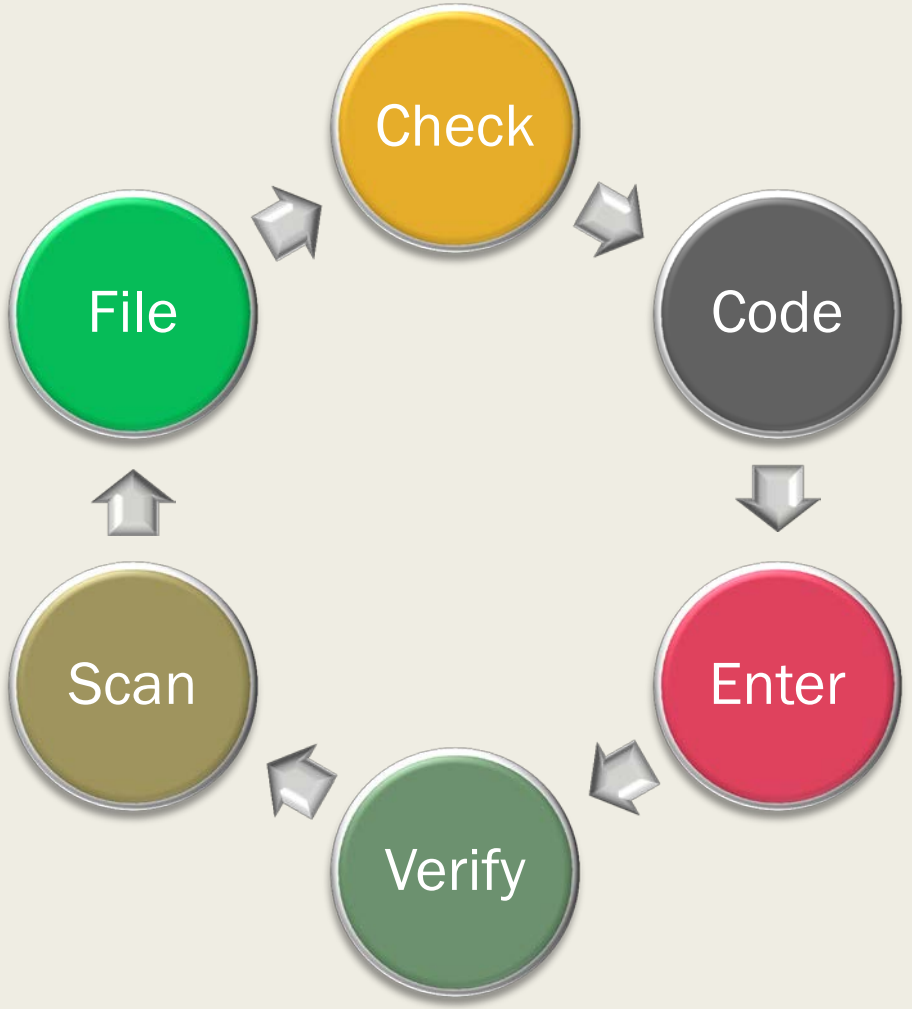


Data Center Summary

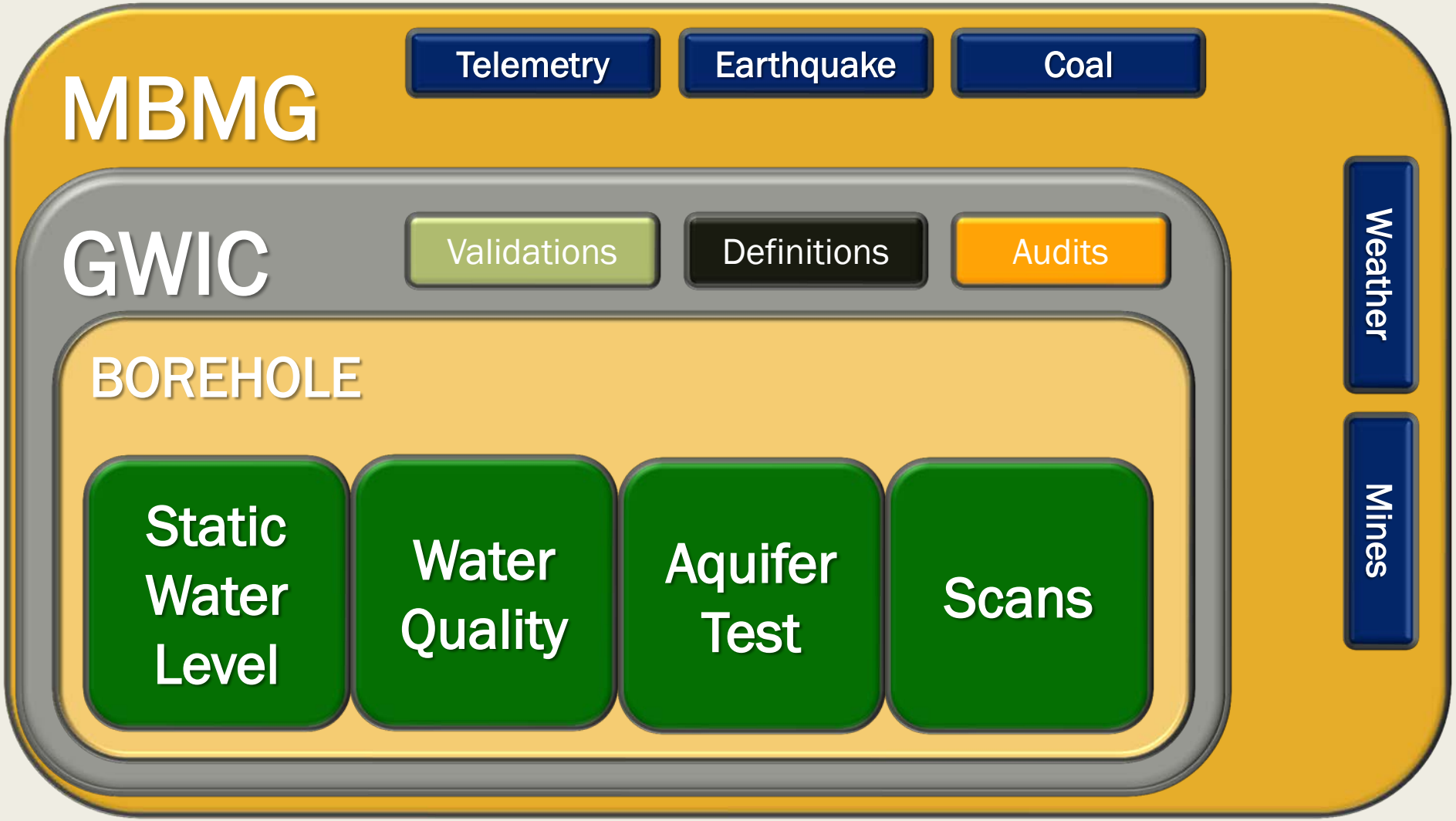
- Databases
  - *27 Enterprise Databases*
  - *715 Tables*
  - *269,952,953 Records*
- Web Services (ESRI)
  - *63 services in 12 categories*
    - Image, Geodata, Map
- Web Services (Geoserver)
  - *8 services*
    - Web Feature Services
  - *Groundwater Monitoring*
- Web Applications
  - *2,531 scripts*
  - *648,731 lines of code*

Gathering the Data

The Process



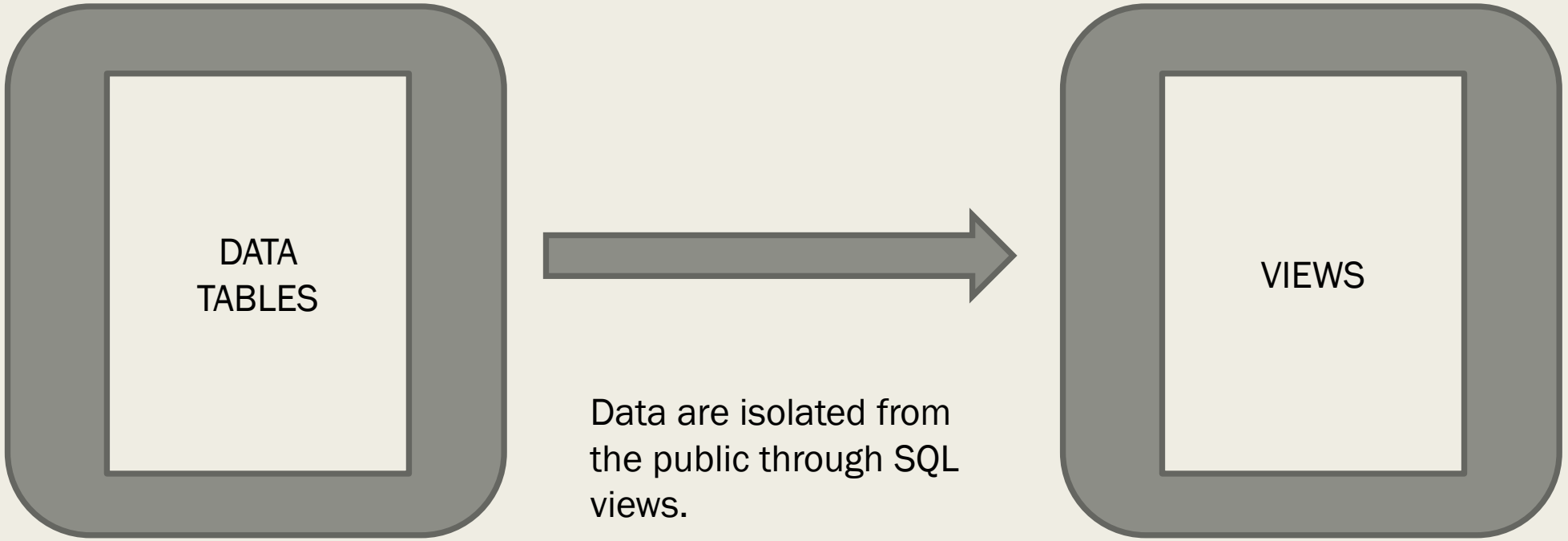
The Layout


MBMG
Telemetry
Earthquake
Coal
GWIC
Validations
Definitions
Audits
BOREHOLE
Static Water Level
Water Quality
Aquifer Test
Scans
Weather
Mines

Software Used to Power Data Feed

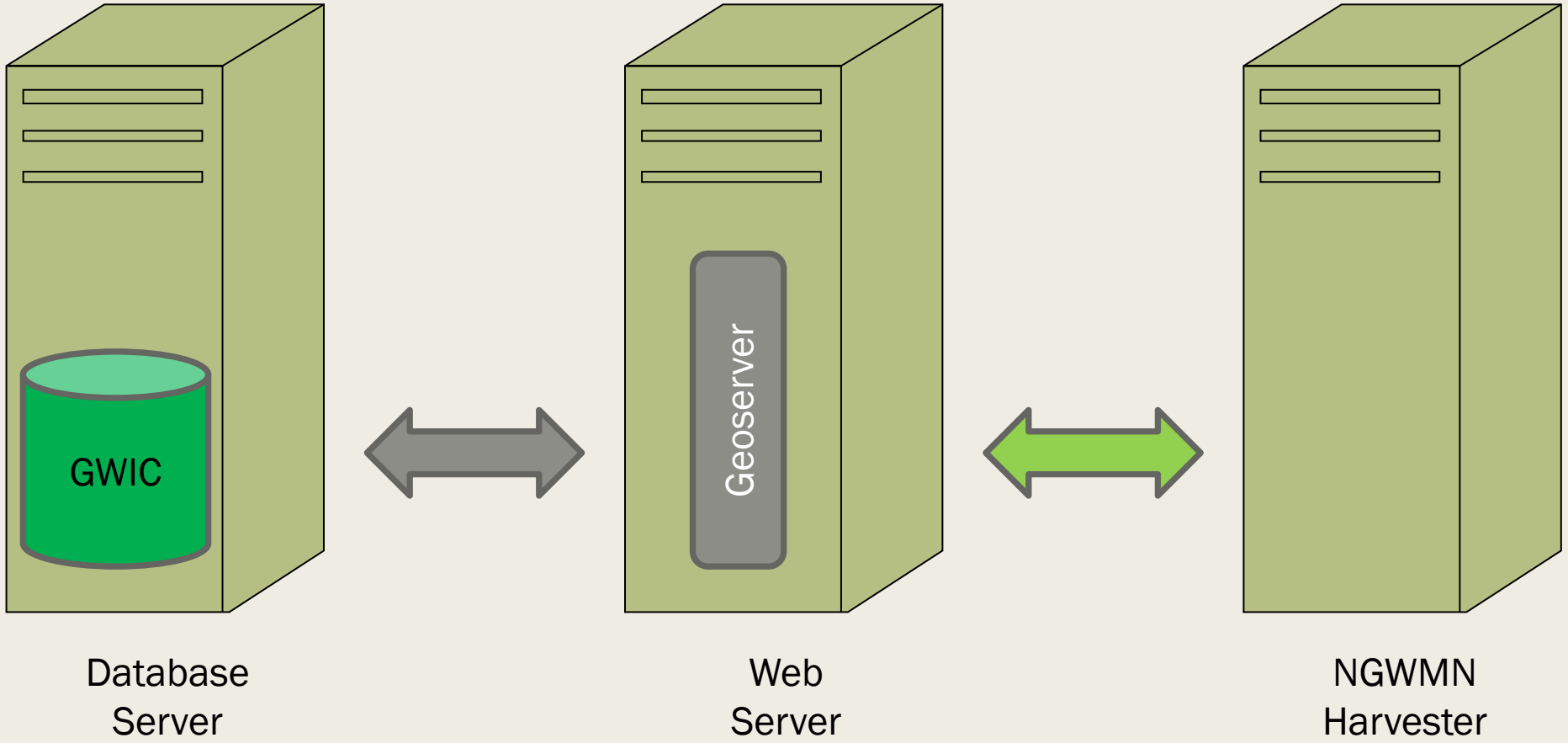
- Microsoft SQL Server 2014, 2016
- Geoserver 2.8.3

Internal Infrastructure

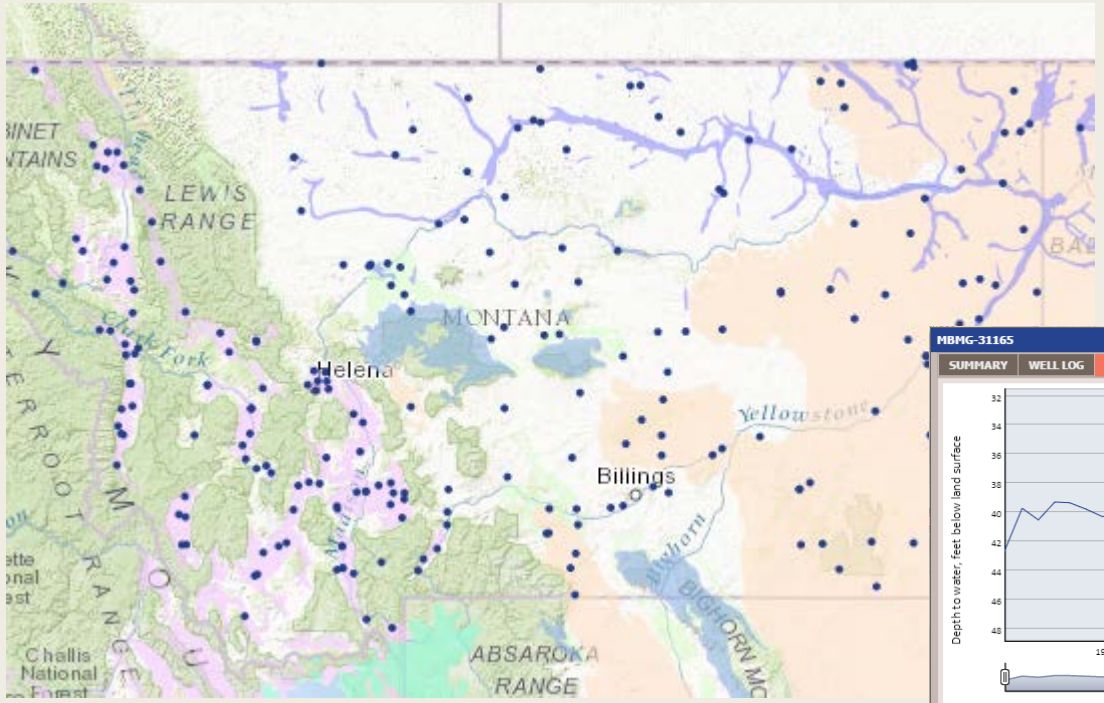


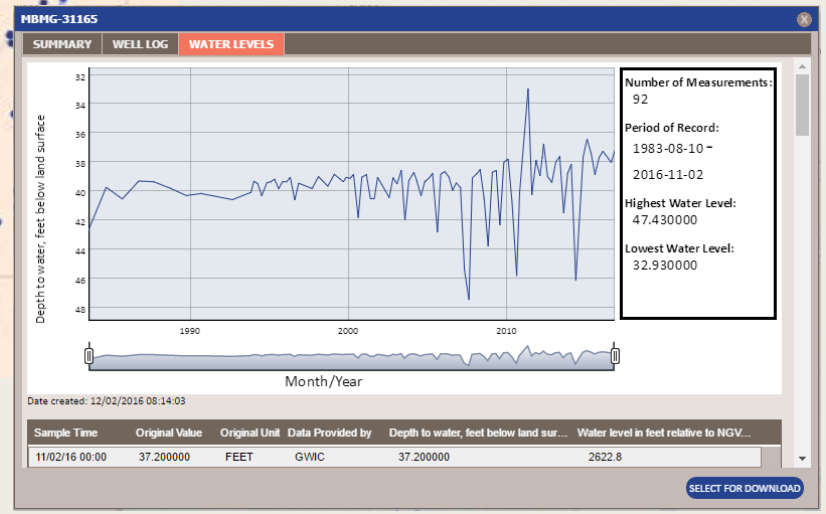
Data are isolated from the public through SQL views.

Feeding the Portal



Where it Ends Up





Strengths of System

- Provides a quick, easy way to get multiple state's "national" data.
- Standardized data formats allows easy integration.
- Once setup and tested, process is fairly independent.
- Since centralizing data with nightly downloads, speed is much better.

Weaknesses of System

- Standardized data formats allows easy integration.
- Design doesn’t allow for bulk changes/updates.
- Changes in location of well not automatic, must be changed in two separate places.
- Open Source software is not the easiest to work with.

Questions/Comments

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Earth as seen on July 6, 2015 from a distance of one million miles by a NASA scientific camera aboard the Deep Space Climate Observatory spacecraft.
Credits: NASA