Subsurface Insights

Develop and provide cloud based platform (Predictive Assimilation Framework) for site monitoring

Data ingestion, management, custom hardware (since 2015), analysis, visualization, reporting,…

Funded through inhouse investments, commercial projects and DOE SBIR

See PI meet poster and DOE website

Numerical modeling of different processes

Not fully linked to ingestion

HPC Resources

Hydrological, geochemical, geophysical, remote sensing ingestion, validation and storage
Application control and automation

Irrigation control

Web server

Remote sensing data

Field data

On demand and automated information
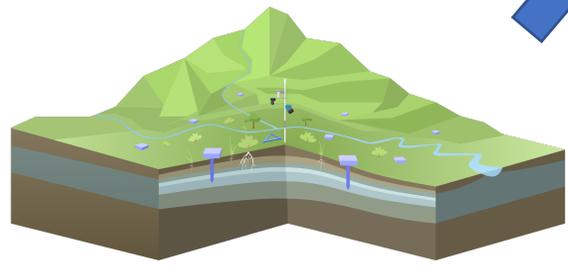
User

Data acquisition using other hardware (own sensors beta)
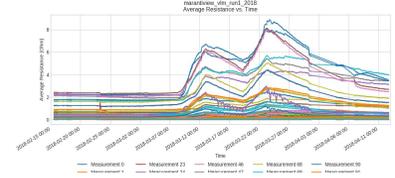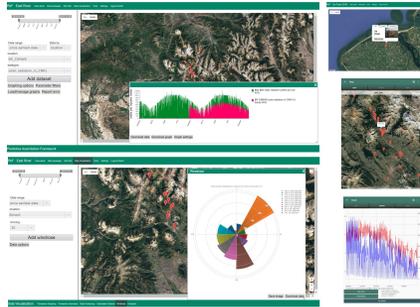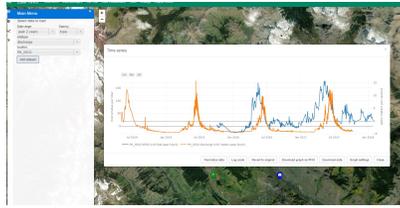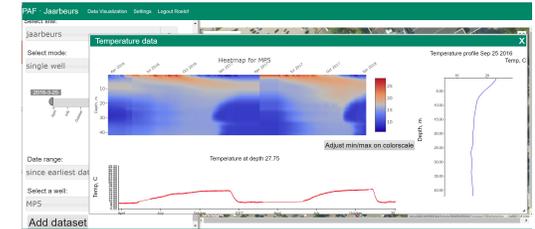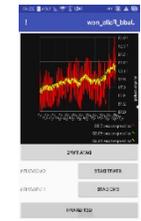
ODM2 ➜ ODMX

- ODM2: https://github.com/ODM2/ODM2
- Supposed to be merge of ODM1 (Hydrology data) and GeochemDB (sample data)
- Developed under NSF funding, used by CUAHSI
- Has many components
  - Datamodel
  - Python API (using SQL Alchemy)
  - Controlled vocabularies (http://vocabulary.odm2.org/)
  - Django stack
  - Several loose components
- Good, but many recognized issues (CV, python2, datamodel, api, variables, units, features of interest)
- Issues were addressed by us in collaboration with one of ODM2 architects (Aufdenkampe) – solved many, many issues
- Will release new version as ODMX
- Not cross compatible with ODM2

ODMX

- Enhancement and substantial modification of NSF Developed ODM2 data model -> result is ODMX datamodel and associated python API. This will be released as open source in May 2019
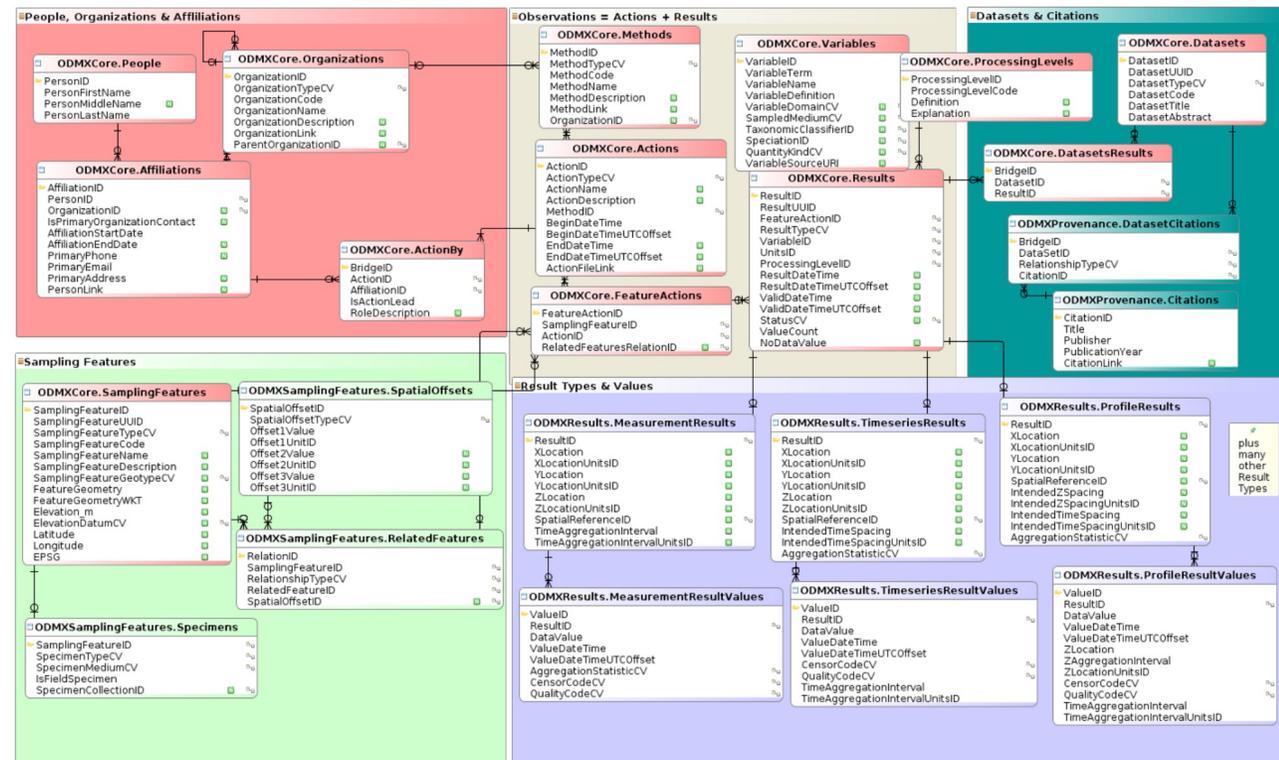
Integrated below/aboveground (phenocam and remote sensing) data processing flow
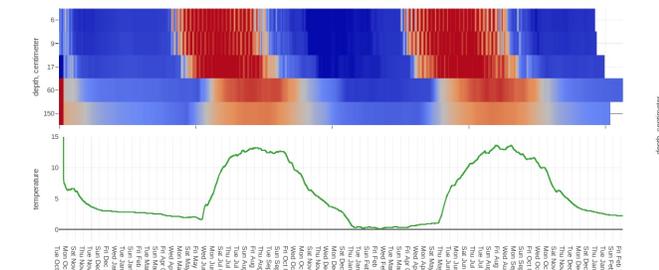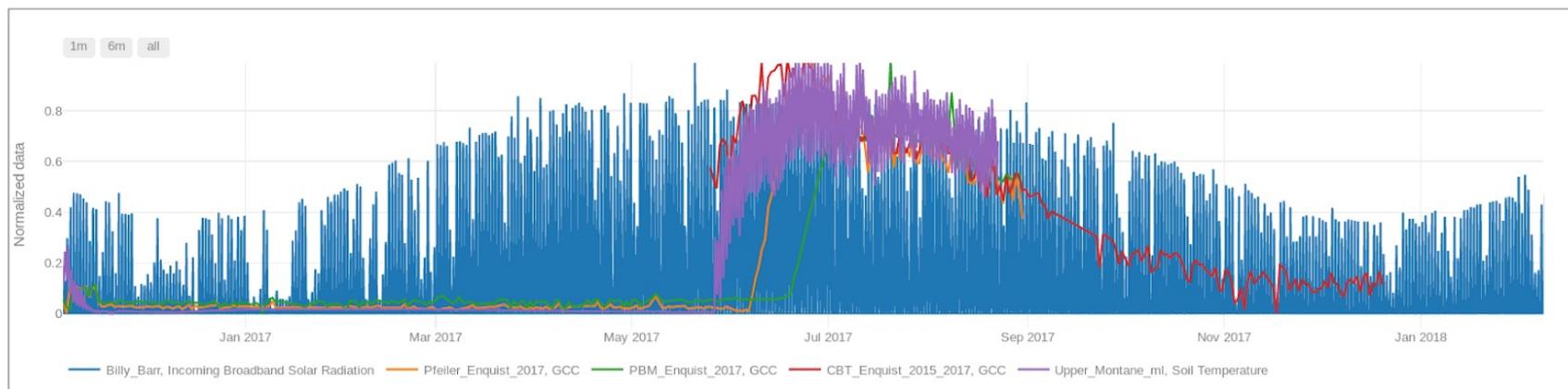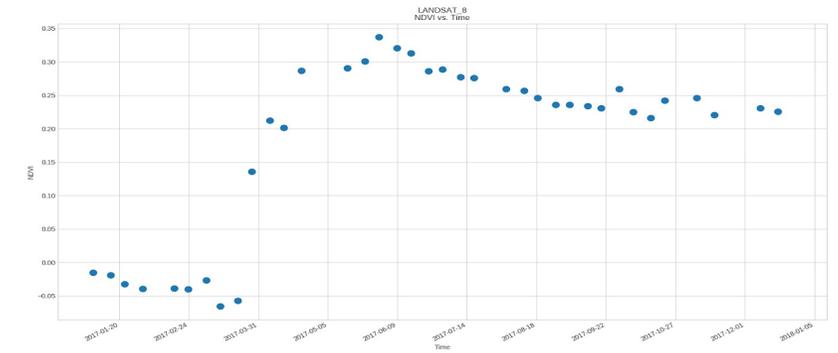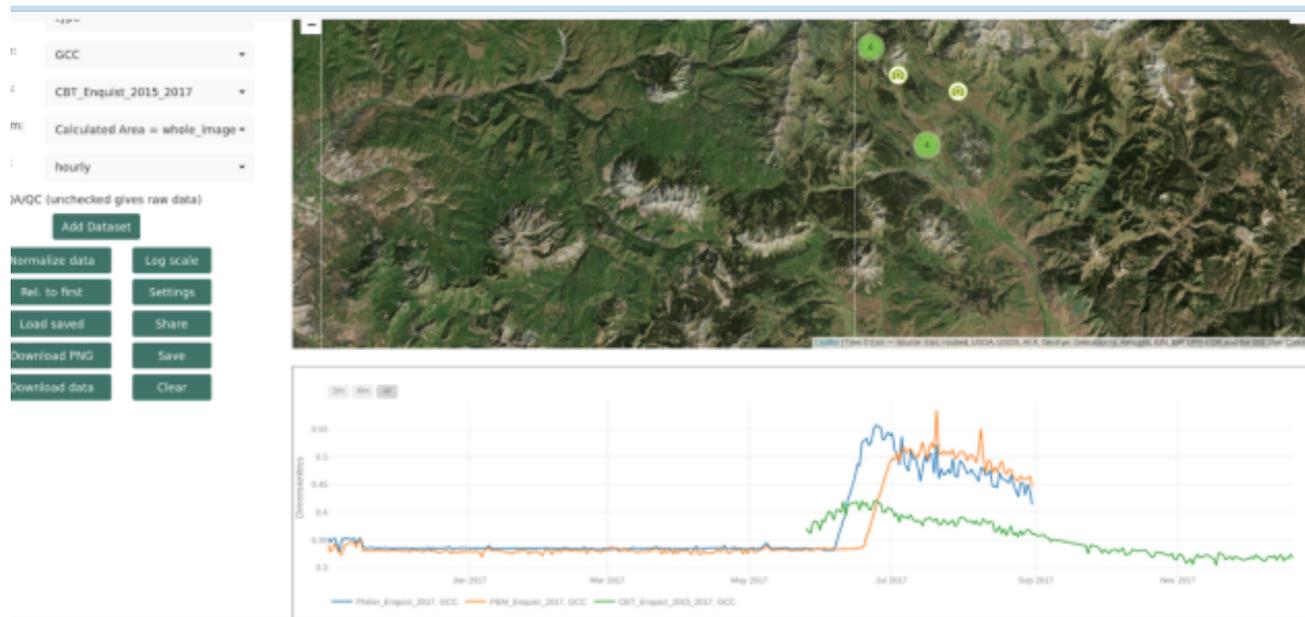
PFLOTRAN

PFLOTRAN scheduler

Subsurface Insights Server

Requests Jobs from server, invokes PFLOTRAN and returns data

- Model storage in relational DB
- *.in file generation using PyFlotran
- API for job control and result retrieval

Web based PFLOTRAN
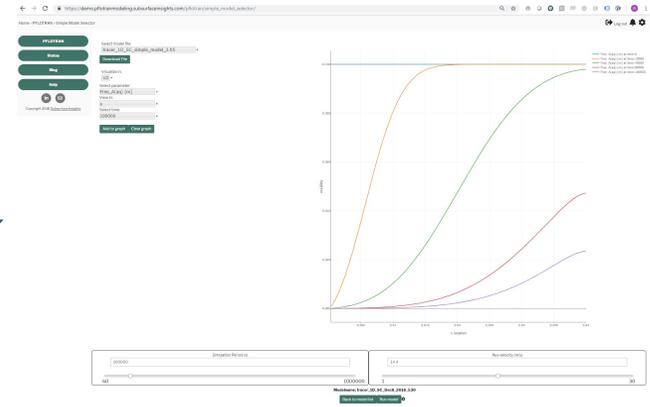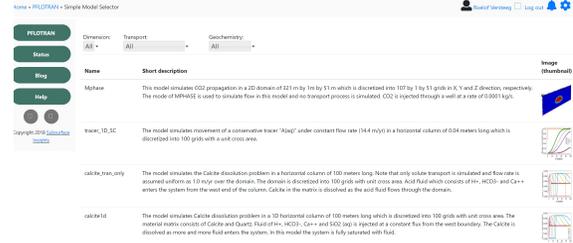
- Model creation and control
- Result visualization

Standard browser

new SBIR on PAF- KBASE coupling (with Chris Henry and Kelly Wrighton)