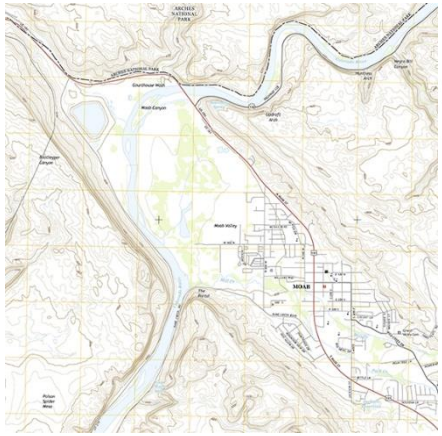
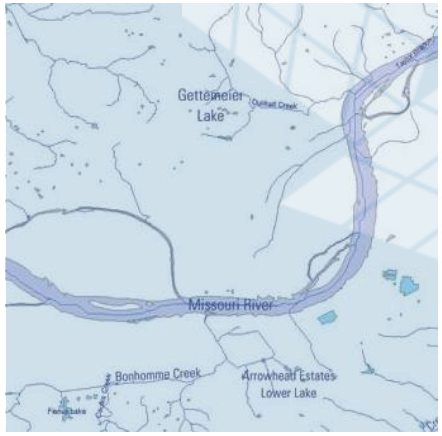
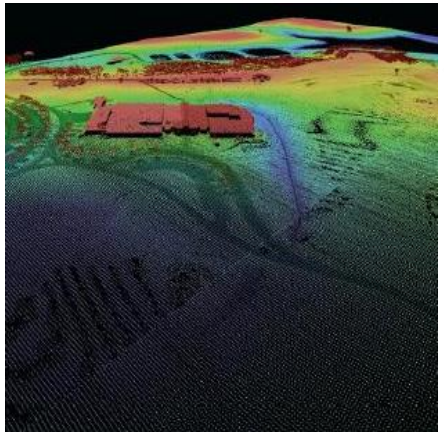
STL PostGIS Day 2019

Agile Development with PostGIS & other OS Tools

USGS-NGTOC Business Systems Team







USGS science for a changing world

The National Map
Your Source for Topographic Information

Date: Nov 14, 2019
Scott Owens – Geographer / Project Manager
NGTOC - Business Systems

Challenges of transforming into an Agile team within a hierarchical government organization

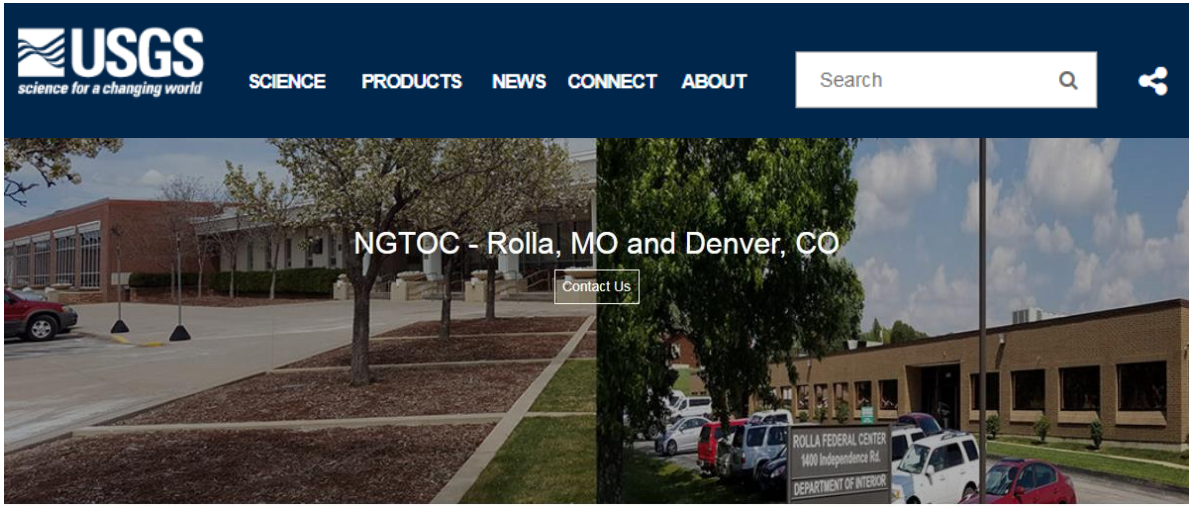
Agenda

- Intro
- Our Organizations Agile Transformation
  - Recognizing the problem(s)
  - Approval & implementation
- Our Team's Agile Journey
- Our Adoption of Open Source Solutions
  - Reasons
  - Examples of how we use PostgreSQL/PostGIS
- Q&A

The National Geospatial Technical Operations Center (NGTOC)

Mission Statement

"The U.S. Geological Survey - National Geospatial Technical Operations Center (NGTOC) provides leadership and world class technical expertise in the acquisition and management of trusted geospatial data, services, and map products for the Nation.“



https://www.usgs.gov/core-science-systems/ngp/ngtoc

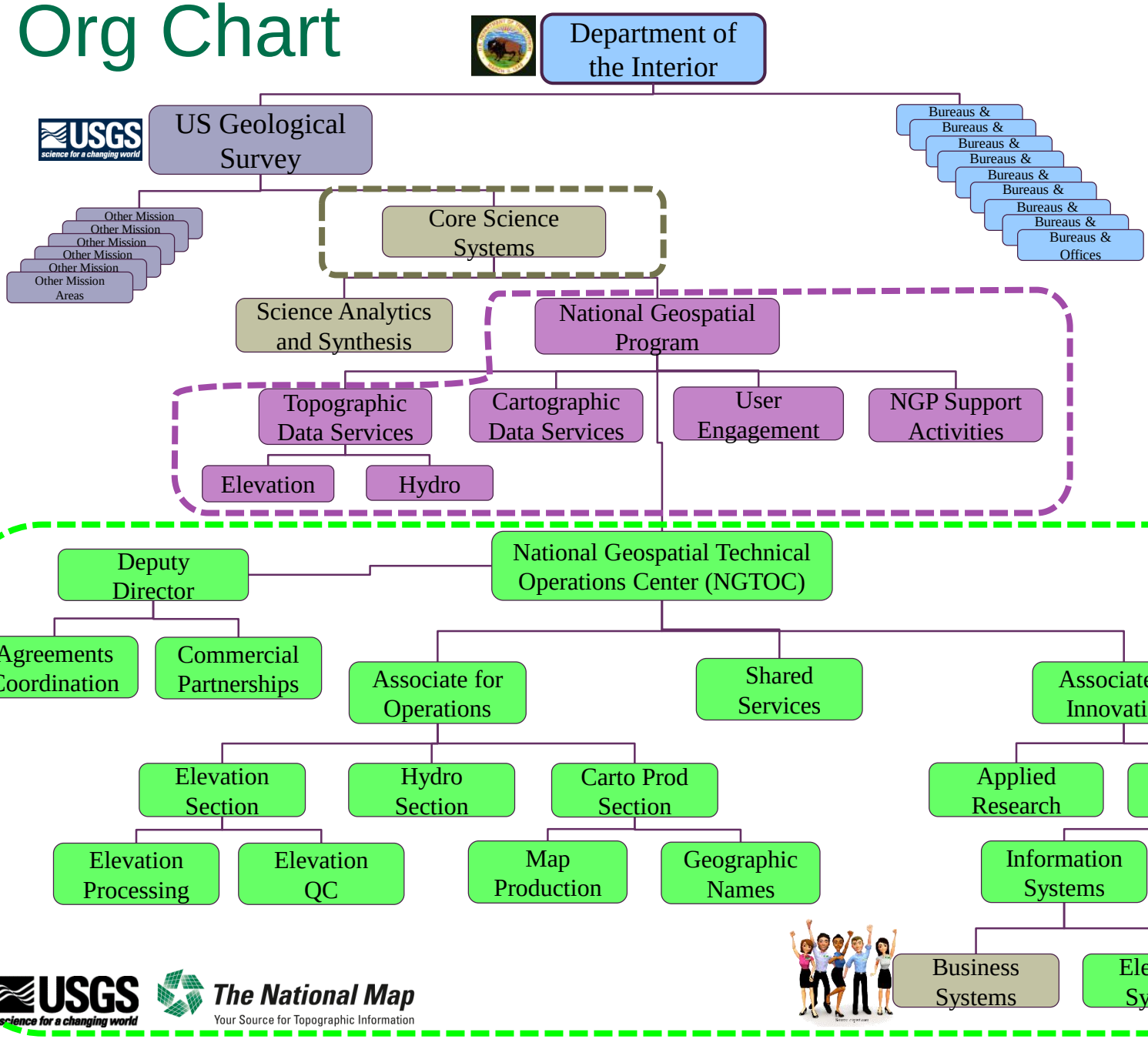
The National Geospatial Technical Operations Center (NGTOC)

Business Systems Team

"Provides business systems support to The National Map and business intelligence support to the National Geospatial Program.“

Source: clipart.com

+ Org Chart



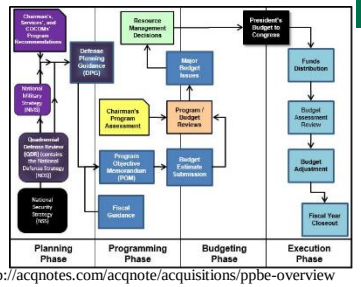
USGS science for a changing world

The National Map
Your Source for Topographic Information

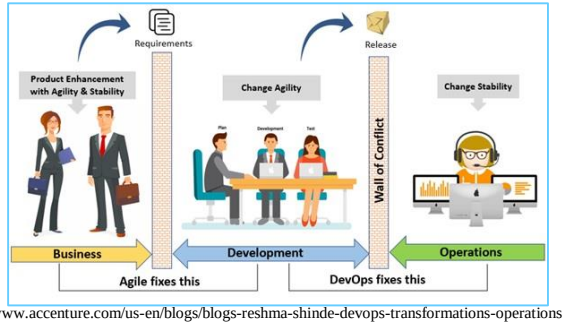
Our Agile Transition

Drivers for Transformation

- Government Budgeting & Planning Process
  - Operates by a defined and deliberate schedule
  - Vague/general requirements
  - Limited flexibility
- Operations
  - Binned into silos
  - Multi-layer management structure
  - Difficulty in cross-department synchronization
- Development Teams
  - Limited resources to effectively manage work
  - Disruptive/unpredictable work schedule
  - Lack of cross-team communication



http://acqnotes.com/acqnote/acquisitions/ppbe-overview

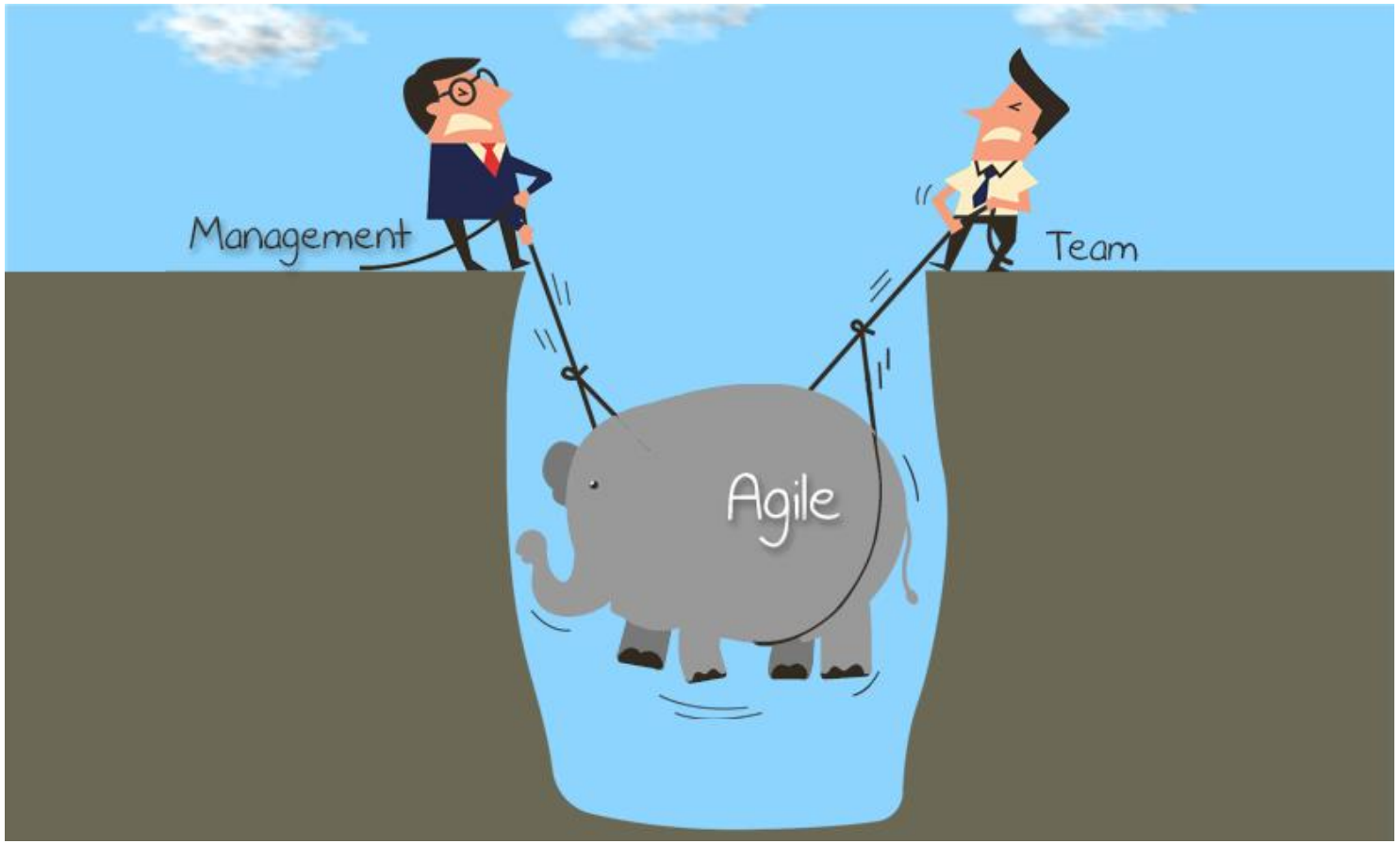


https://www.accenture.com/us-en/blogs/blogs-reshma-shinde-devops-transformations-operations

This Photo by Unknown Author is licensed under CC BY-SA

Ok, let's do it!

How do we make this work?



Source: David Tzemach's Blog (http://www.machtested.com/)

Our Government Agile Adapter Kit

How we planned to make it work for us

- Dev teams divided by functional area
  - Mix of contractor & gov personnel
  - Each adopt Agile to fit their operations
- PM serves as "Scrum Master"
  - In many cases also as "pseudo" Product Owner
- Share knowledge and lessons learned
- Ensure & maintain transparency
  - JIRA, Project Pages, regular meetings
- Participate in annual planning

HQ Schedule of Key Events

- Annual Program Planning
- Quarterly Program Review
- Monthly Program Review

Transparency & Status updates

- Weekly Updates
- Project Pages
- Monthly IWG

Cross-Team collaboration

- JIRA Board
- Monthly Dev Sync
- Monthly PM Sync

Development Teams

- Sprint Planning
- Daily Scrum
- 2-3 Week Sprints

Agile Scale

Gears by Unknown Author is licensed under CC BY-SA-NC

USGS science for a changing world

The National Map
Your Source for Topographic Information

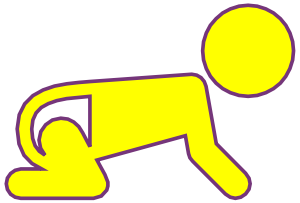
Our Team's Agile Journey

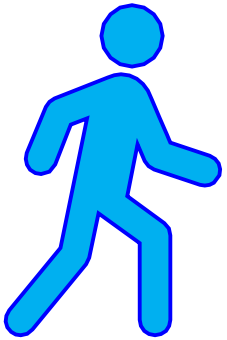
Business Systems Team – Launch Preparations

- Last of Seven Teams to go Agile
  - Waited for Project Manager to get hired and onboard
  - Allow the new PM flexibility to transform the team
- Hired the Project Manager (That's me)
  - Lead, coach, and develop the team
  - Apply Agile development methods
  - Interact with stakeholders, product and business owners
  - Ensure transparency
- The Team
  - 2 Government & 3 Contactor Developers
  - Responsible for 6 x major and 10 x minor products
  - Participated in initial Agile Mass Training

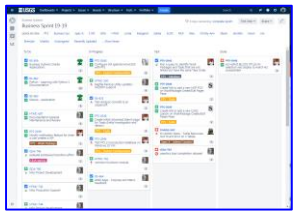
The Approach

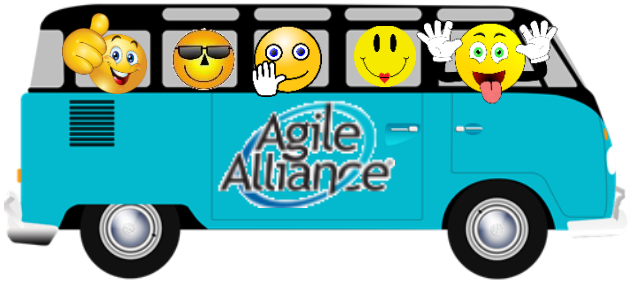
Crawl, Walk…stumble a few times…then Sprint!





Configure JIRA board, build backlog, set up schedules, start Scrum, we're off to Agile





This Photo by Unknown Author is licensed under CC BY-NC

Adoption of Open Source Solutions

Drivers for shifting to Open Source

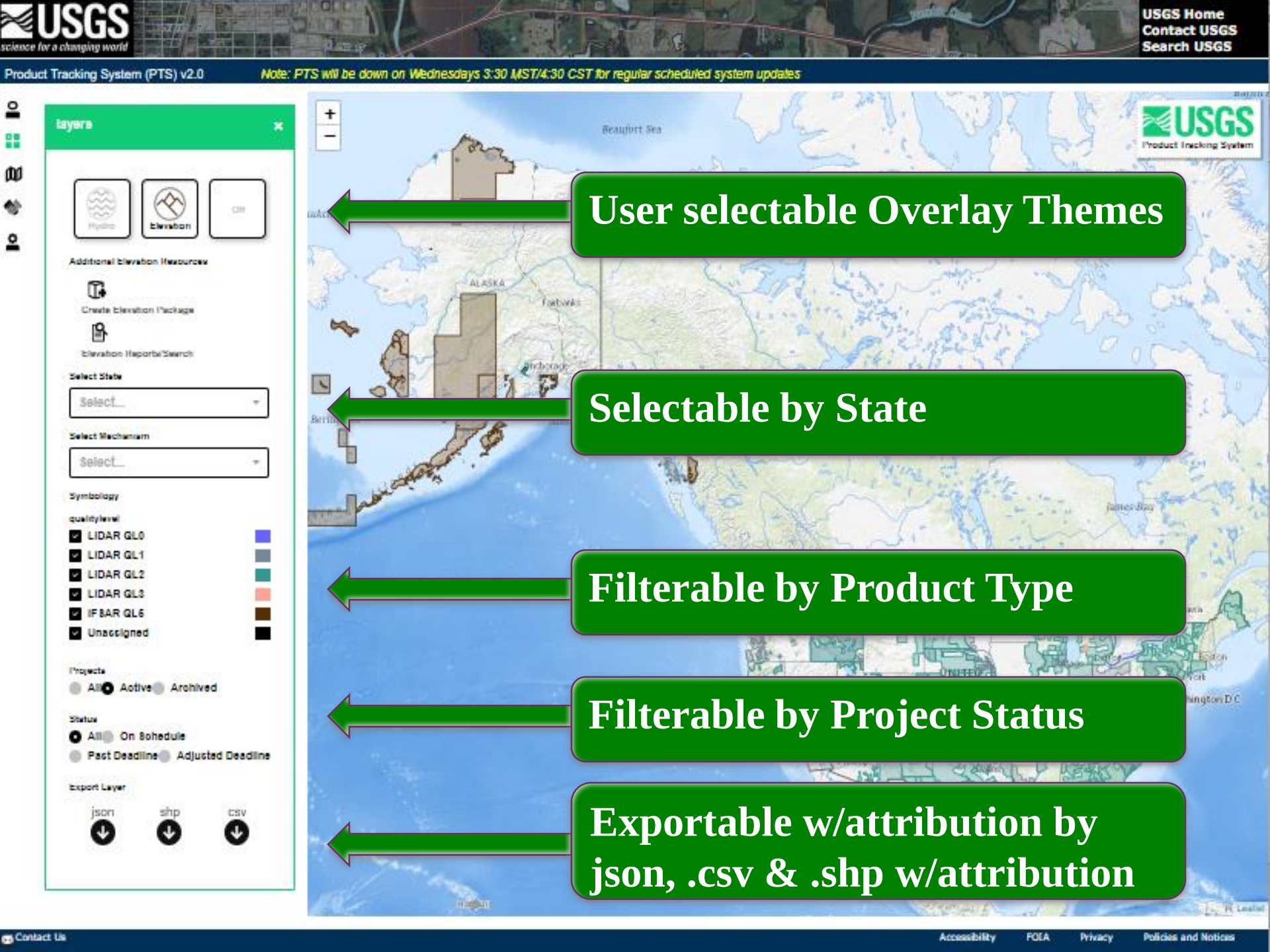
- Innovative
  - Community of contributors constantly improving applications
  - Leverages proven best practices
  - Developers love it
- Supportable
  - Diverse and motivated support community on the Web
  - No vendor lock-in
- Costs
  - Increasing costs of Proprietary software and support
  - Decreasing budget

How We use Postgres/PostGIS

Two (but not exclusive) Use Cases

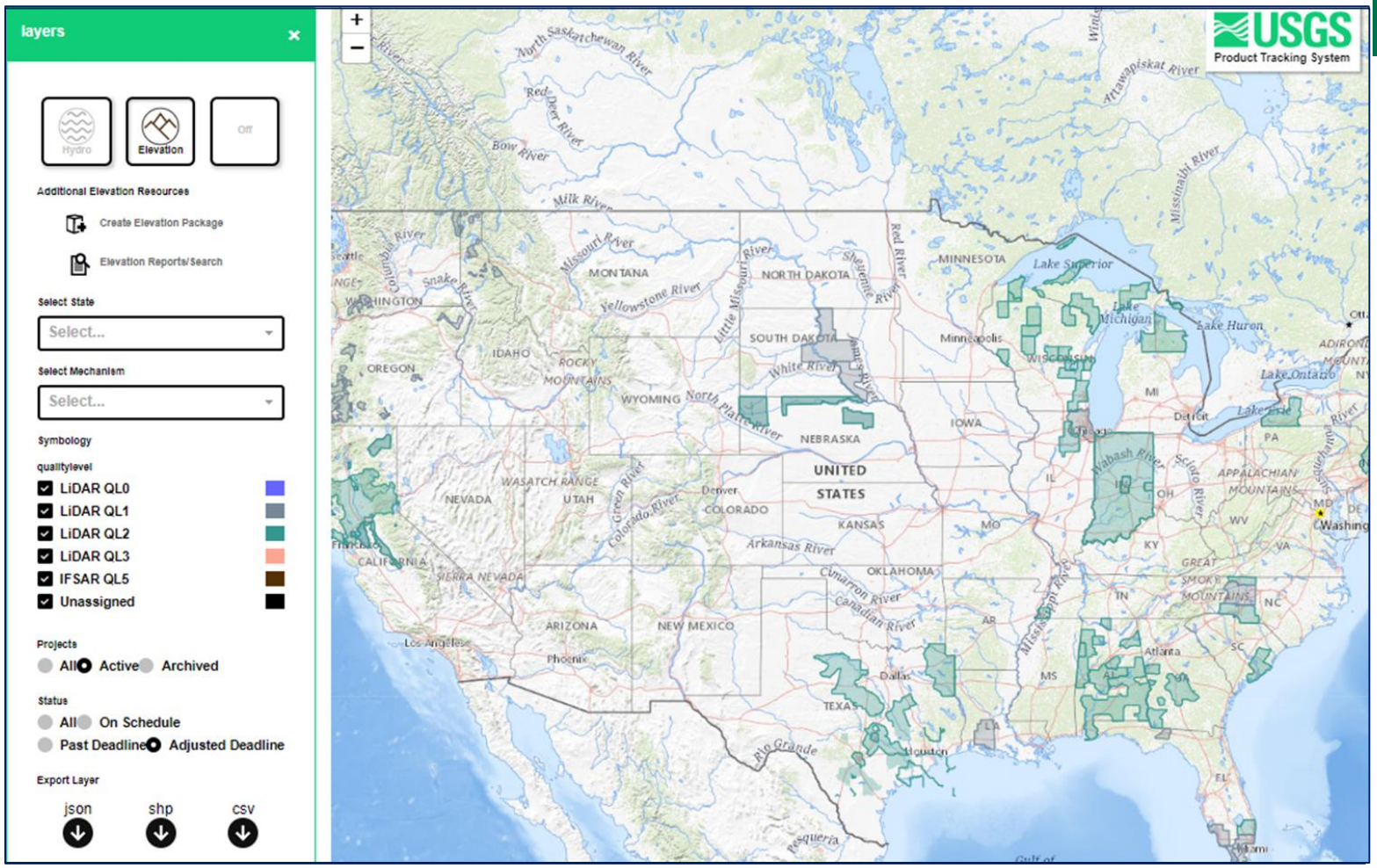
- Product Tracking System (PTS)
  - Purpose: Tracking and Reporting for Agreements, Task Orders, Data Processing and Publishing
  - Open Source Technology Stack: Spring, Leaflet, Geoserver, PostgreSQL, PostGIS
  - Scheduled to be migrated to Django, Python, Leaflet, Geoserver, PostgreSQL, PostGIS

- Specifications Explorer (Spec-X)
  - Purpose: Documents and provisions The National Map Specifications in a relational database to the public through a web interface
  - Open Source Technology Stack: Spring, Leaflet, Geoserver, PostgreSQL, PostGIS
  - Scheduled to be migrated: to Django, Python, Leaflet, Geoserver, PostgreSQL, PostGIS


USGS
science for a changing world
USGS Home
Contact USGS
Search USGS
Product Tracking System (PTS) v2.0
Note: PTS will be down on Wednesdays 3:30 MST/4:30 CST for regular scheduled system updates
layers
Hydro
Elevation
Additional Elevation Resources
Create Elevation Package
Elevation Reports/Search
Select State
Select...
Select Mechanism
Select...
Symbology
qualitylevel
LIDAR QL0
LIDAR QL1
LIDAR QL2
LIDAR QL3
IFSAR QL6
Unassigned
Projects
All
Active
Archived
Status
All
On Schedule
Past Deadline
Adjusted Deadline
Export Layer
json
shp
csv
Beaufort Sea
ALASKA
Fairbanks
Anchorage
USGS
Product Tracking System
User selectable Overlay Themes
Selectable by State
Filterable by Product Type
Filterable by Project Status
Exportable w/attribution by
json, .csv & .shp w/attribution
Contact Us
Accessibility
FOIA
Privacy
Policies and Notices

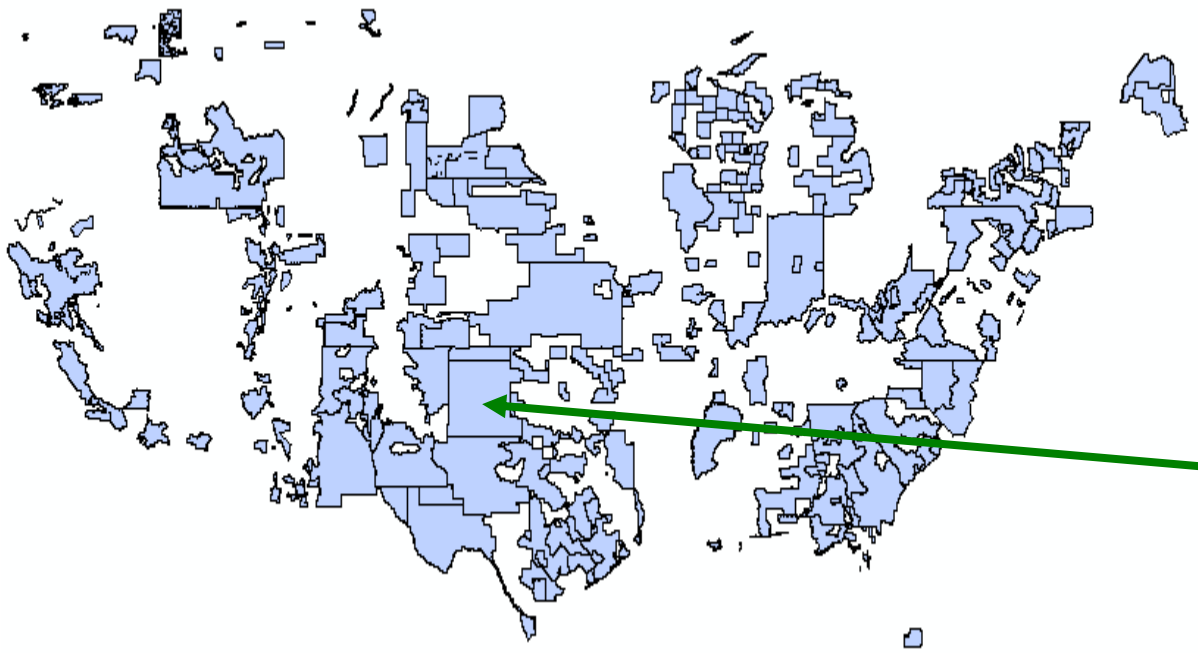
Example Display Filters

Users can visualize by status



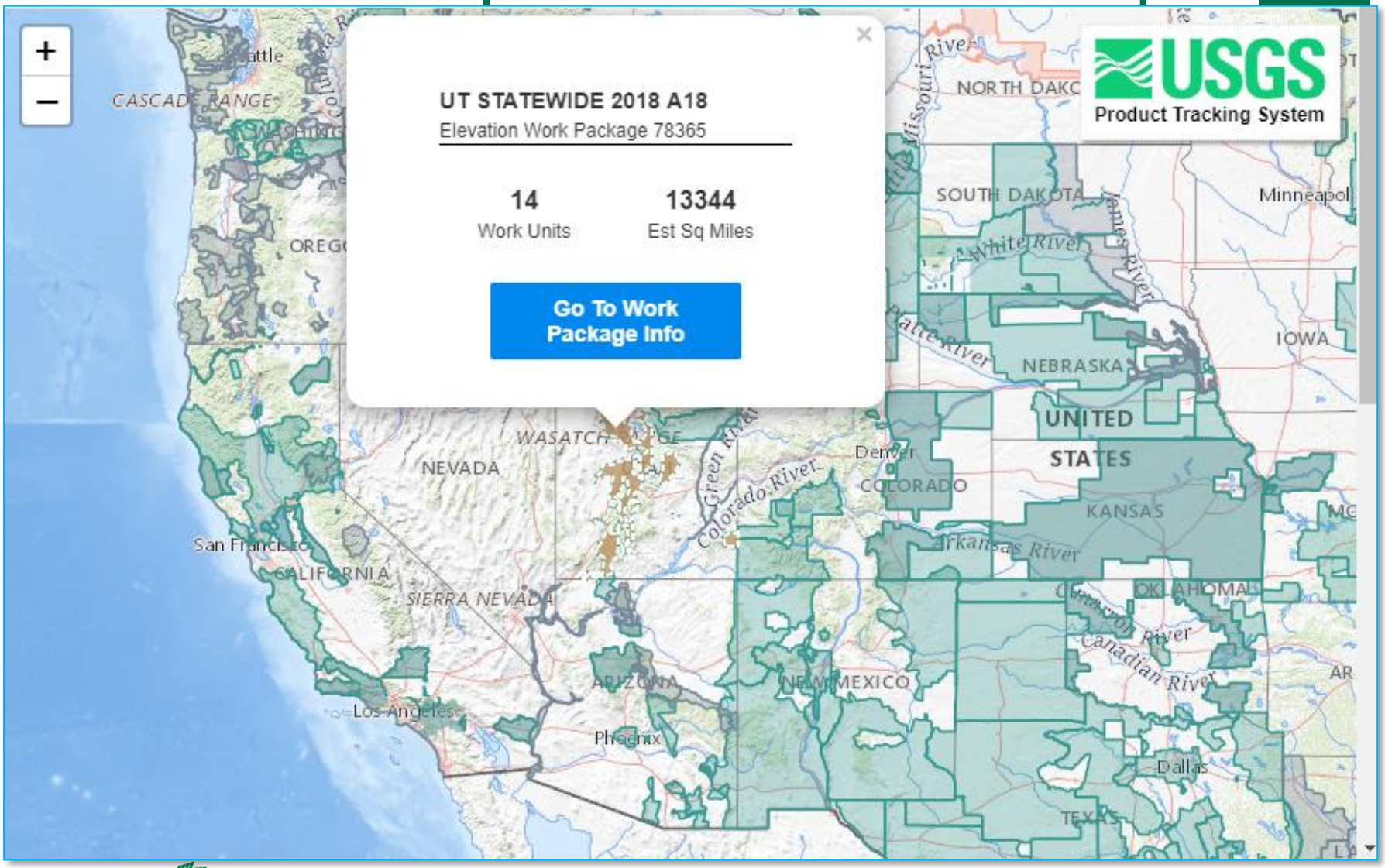
Export Example

Shapefile with attributions



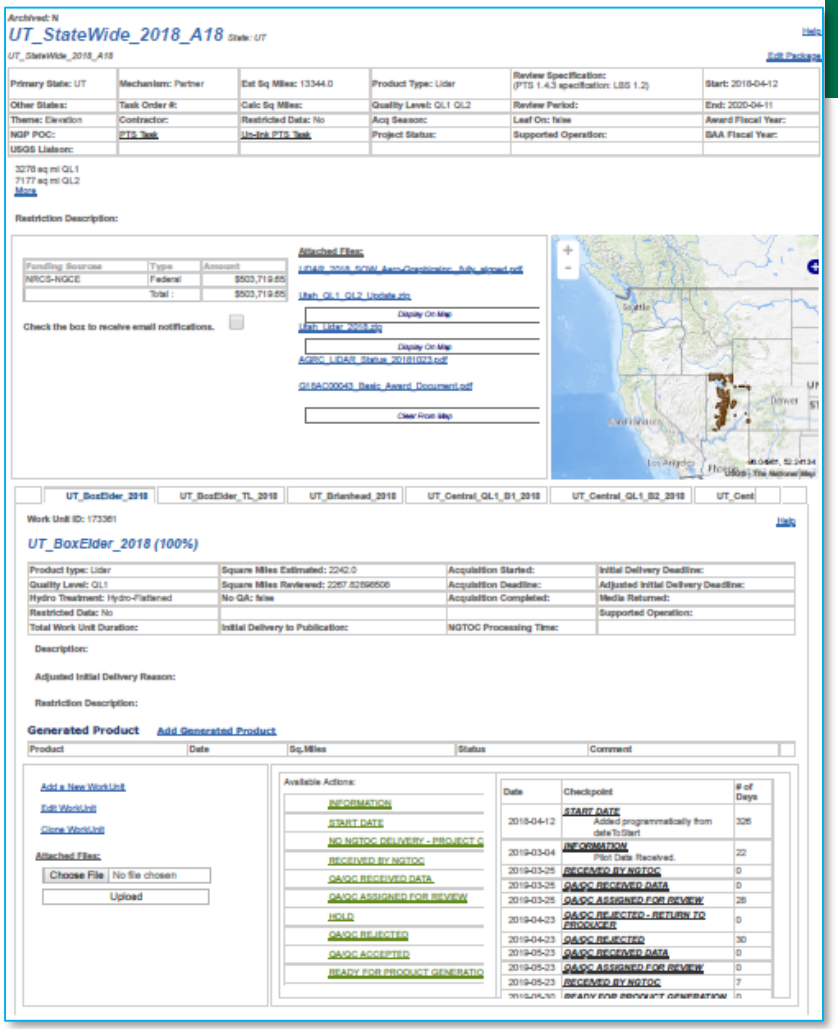
work_units	14
aliases	
archived	0
awardfy	
calculated	0
dataacq	
date_to_en	6/28/2020
date_to_st	1/31/2018
estimated_	34005
FID	57
fundingsou	
id	76484
mechanism	155
name	TX_Panhandle_2017_D18
otherstate	
past_deadl	{"past deadline"}
percent_co	64
product_ty	Lidar
projectsta	
qualitylev	LiDAR QL2
restricte0	
restricted	0
reviewed_s	35087.55857
Shape	Polygon
states	TX
task_order	140G0218F0070
theme	Elevation

PTS Data Project Overview Example



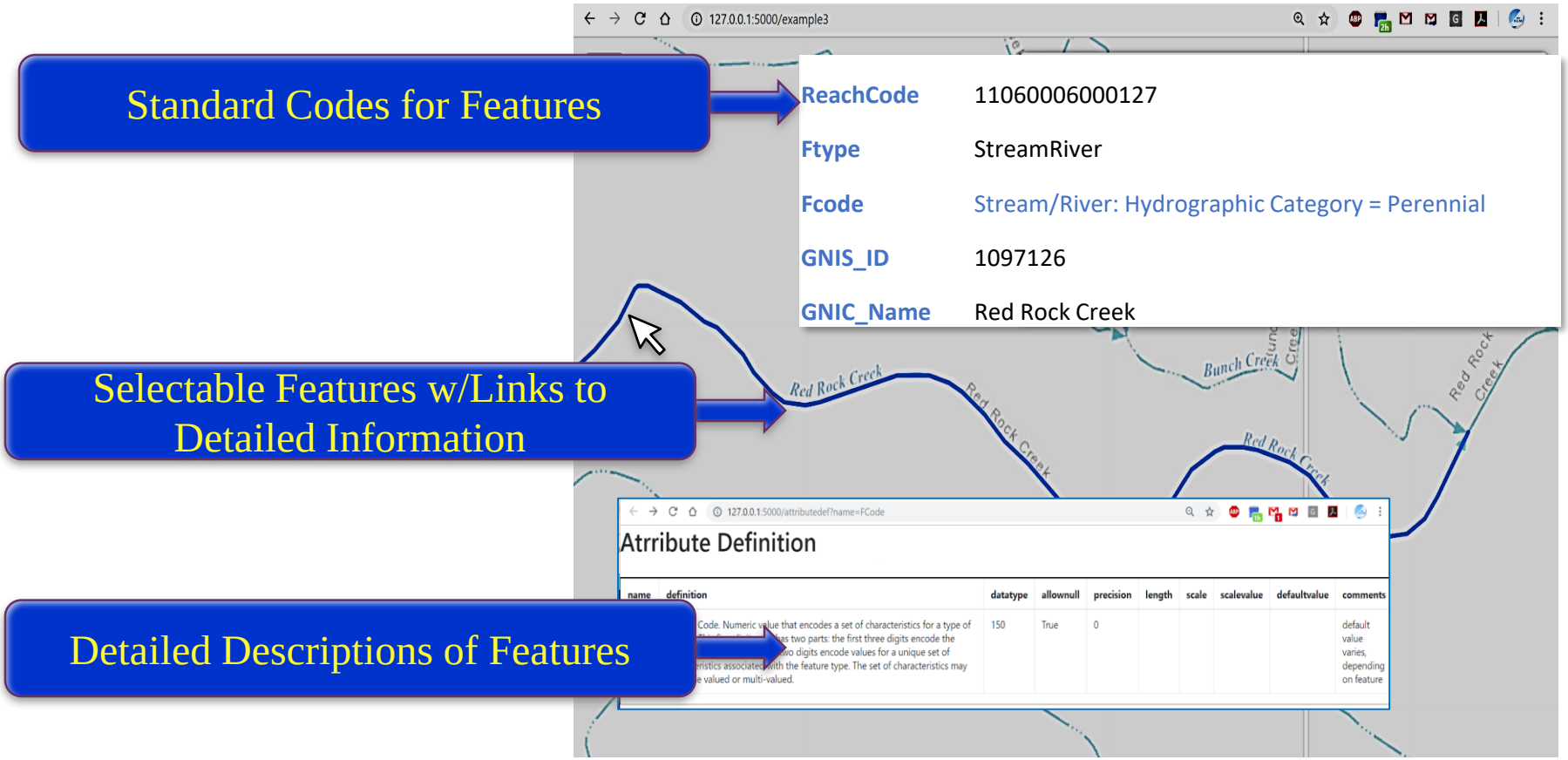
Project Detail Example

- General Project Info
- Project Footprint & File Attachments
- Information on Individual Data Sets to be Processed
- Status Tracking for Data Delivery, Processing & Publishing



Specification Explorer Example

Interactive User Interface Linked to Detailed Information



Summary

PostGIS is perfectly meeting our requirement

- Its easy to learn
- It’s reliable
- It’s powerful
- Has a great support network on the web
- No Vendor Lock!

This Photo by Unknown Author is licensed under CC BY-SA-NC

Questions & Answers