Report on the Open Water Data Initiative (OWDI)

National Geospatial Advisory Committee
September 1, 2015

Al Rea, USGS National Geospatial Program

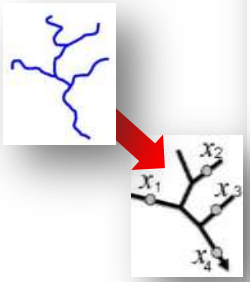
Subcommittee on Spatial Water Data

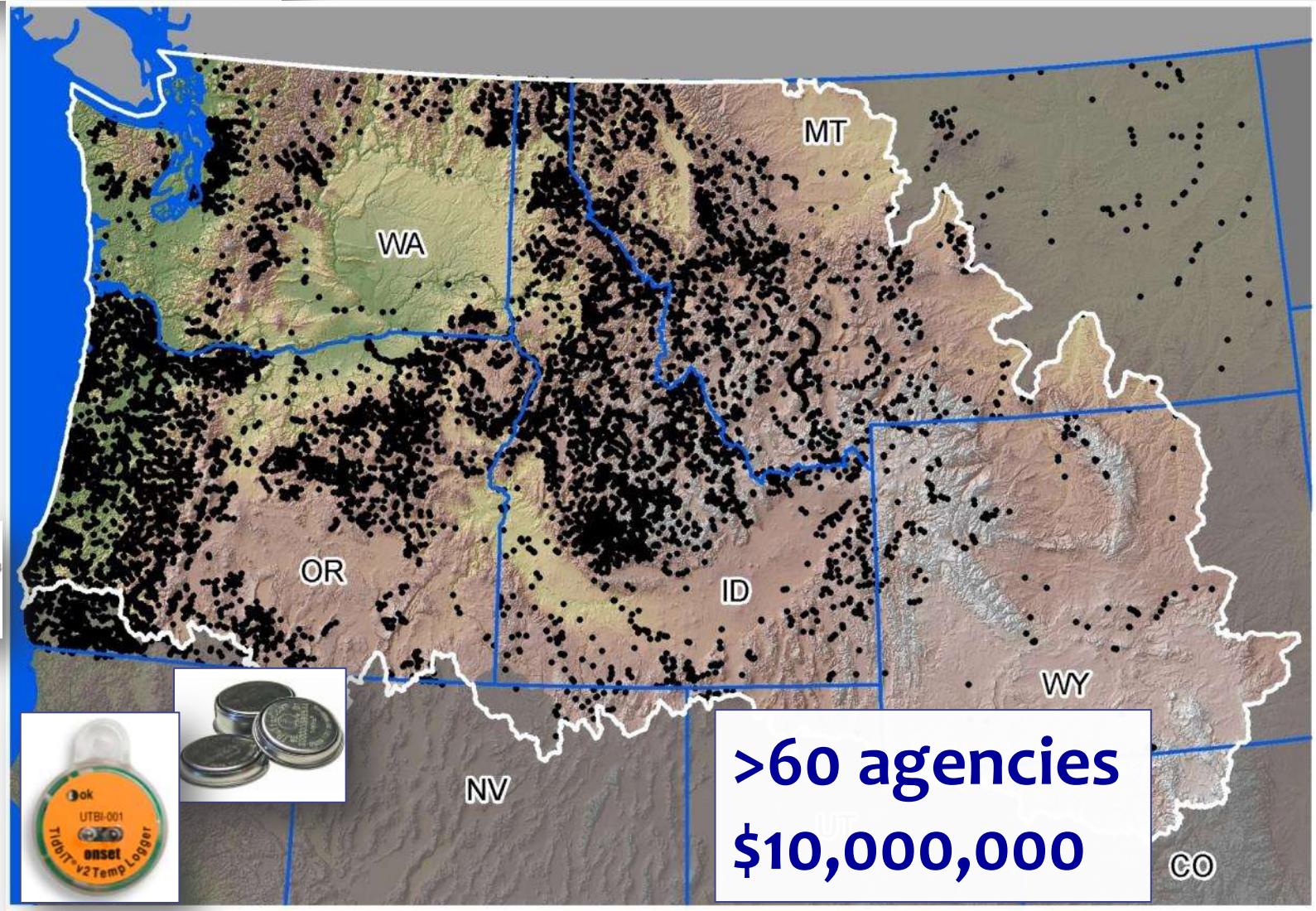
OWDI as a Challenge

- Access to water data is difficult
  - Collected by hundreds of organizations
  - No common infrastructure
  - WaterML2 new exchange standard (O&M)
- Understanding connections requires a geospatial framework
  - Landscape to stream
  - Stream to stream

NorWeST Stream Temp

>45,000,000 hourly records
>15,000 unique stream sites





>60 agencies
$10,000,000

Open Water Web

Water Data Catalog	Water Data as a Service	Enriching Water Data	Community for Water Data,Tools
Find Source Data	Consensus Standards	Network Routing	Marketplace for Knowledge
CreateThemes	Visualization and Delivery	Coupling Models	UsageTracking
Recruit / Engage Partners	Catalog and Serve	Geospatial Framework	Best Practices

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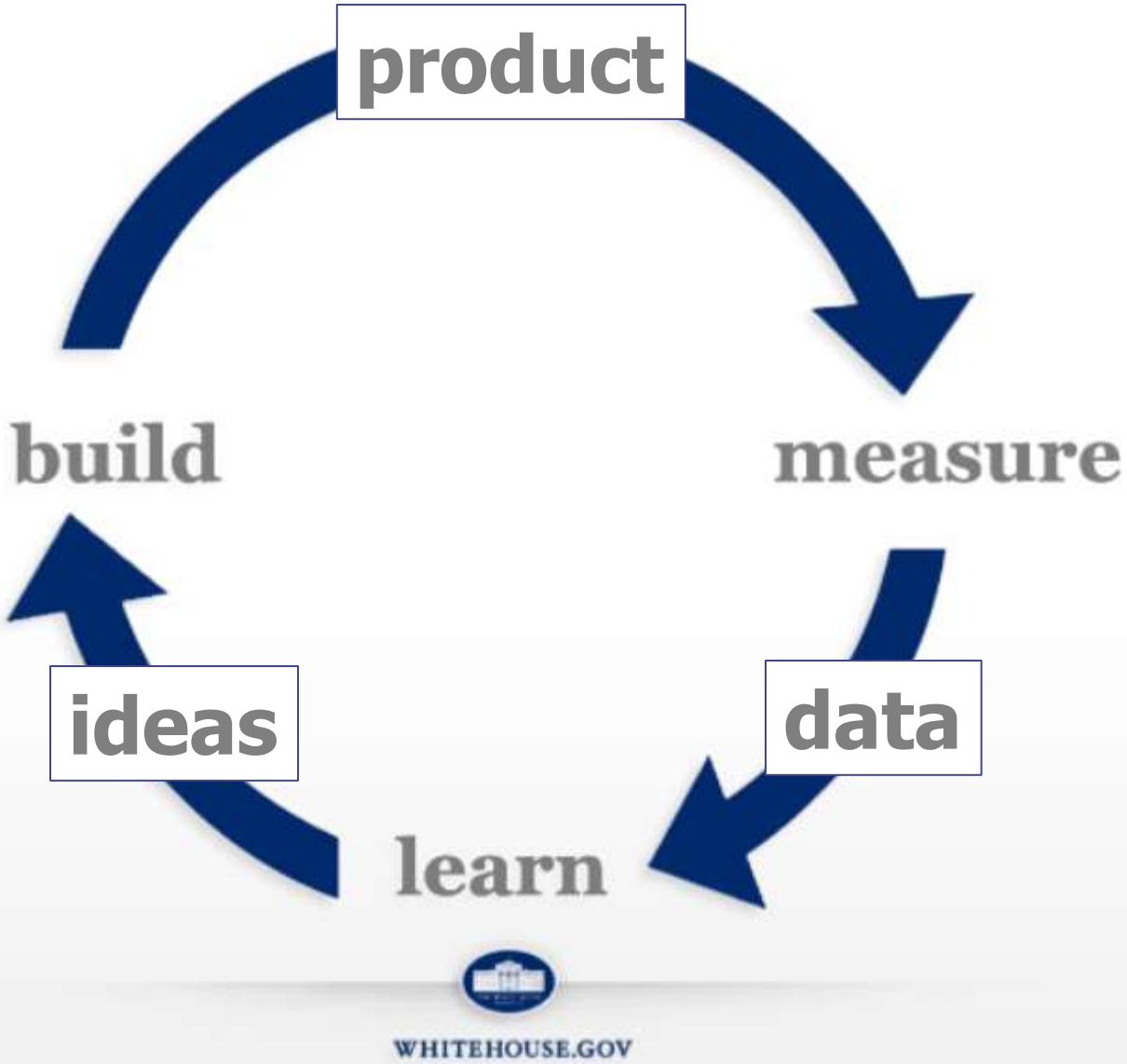
ACWI Advisory Committee on Water Information

Lean Startup Methodology



Use Case Concepts

- Define use cases that respond to societal needs and cover broad range of water resources issues
- Identify critical data inputs — focus on these first
- Our emphasis is on the data, not the full solution

OWDI Working Groups

Work Group 1:

National Flood Interoperability Experiment

- Identify flood data including stream-flow observations, forecasts and impacts
- Developing *geospatial framework* and exploring data conflation

Work Group 2:

Drought Decision Support System

- Identify water resources data including natural flow, reservoir storage and drought impacts
- Explore visualization of drought in Lower Colorado

Work Group 3:

Spill Response Tool

- Review existing modeling applications and data requirements
- Exploring requirements for new/additional data (e.g. velocity forecasts and reservoir residence times)

fgdc
Federal Geographic Data Committee

ACWI
Advisory Committee on Water Information

Common Data Needs

- NHDPlus V2.1
  - National in single file geodatabase
  - Denormalized (flattened) data model
  - Available for download and as services
- Sites indexed to NHDPlus V2.1 network
  - Streamgages
  - NWS river forecast points
  - Dams
  - Large diversions and return flows
  - …and many others

Status: Water Data Catalog

- Climate Data Initiative—Water Theme
  - Use same catalog
  - Develop separate landing page
- Linked data catalog
  - Federated data model
  - Data discovery using upstream/downstream navigation
- Data quality info
- Machine readable ontologies

Status: Water Data as a Service

- NWS forecasts and NWIS data as WML2
- Robust serving capacity is necessary
- Slow services aren't used
- Measurement of service usage is key
- Repackaged seamless NHDPlus data for download—useful variation
- Many more datasets

Status: Enriching Water Data

- Linking data to a standardized geospatial framework (e.g. NHDPlus)
  - Sites with observations and measurements
  - Better integration of geospatial layers (e.g. WBD linked to NHDPlus network)
  - Modeling parameters for catchments
- Network trace (upstream/downstream) capability is key

Status: Water Data and Tools Marketplace (Community)

- Community dialogue (SSWD, AWRA, etc.)
- Web-based forum needed (wiki or similar)
- Code/tool/procedure open source repositories (e.g. GitHub)

OWDI Examples:

- ArcGIS Online web map showcasing some OWDI data services:

  http://arcg.is/1EIL4bP

- National denormalized NHDPlus V2.1 download:

  ftp://ec2-54-227-241-43.compute-1.amazonaws.com/NHDplus/OWDI/

HOME

OWDI NHDPlus v2.1 Framework Datasets - Draft

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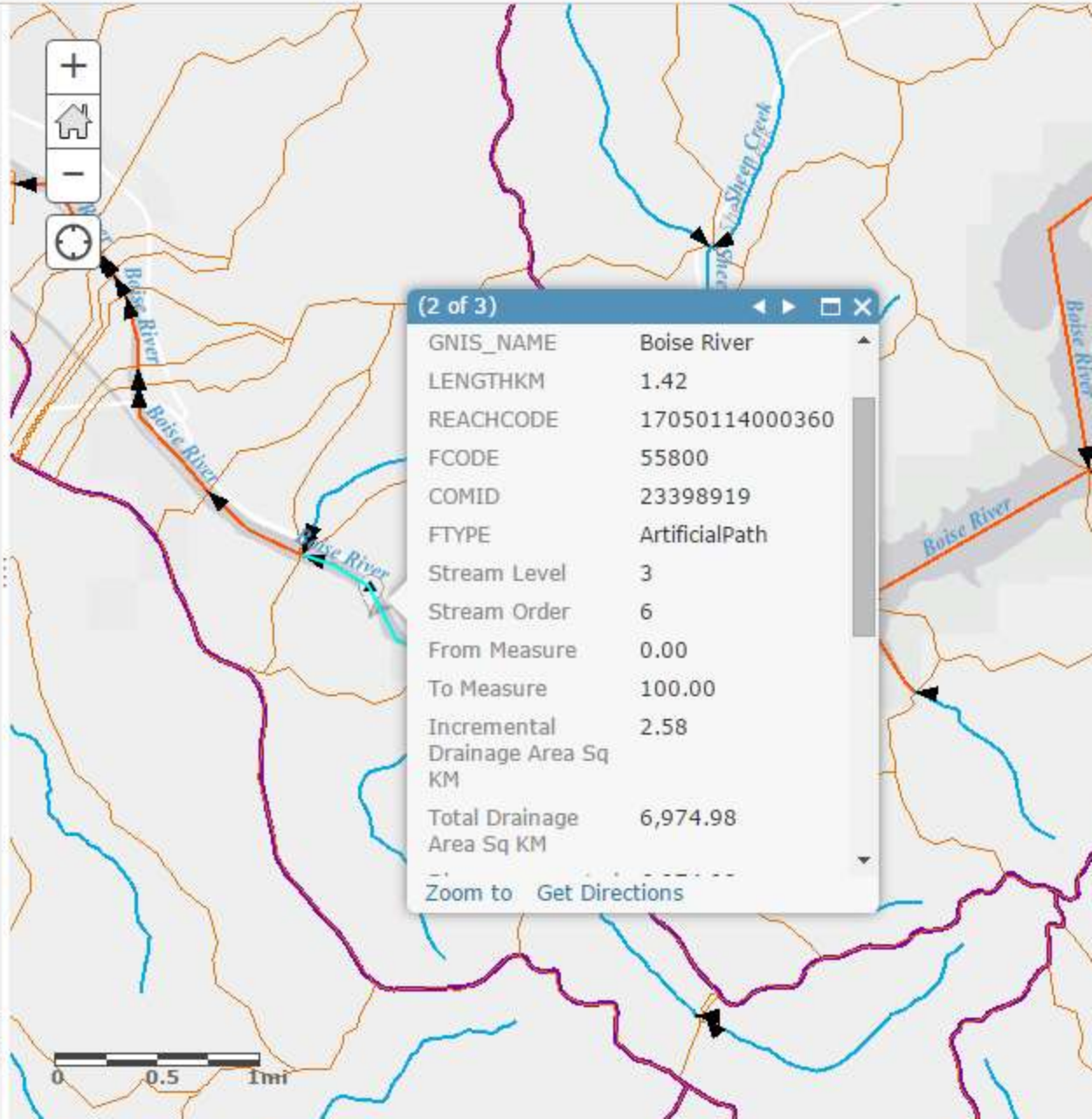
Contents

- FEMA National Flood Hazard Layer
- Streamgages Linked to NHDPlus V2.1
- NHDPlus V2.1
  - Flow Direction
  - Network Flowline
  - Non-Network Flowline
  - Waterbody
  - NHD Point
  - NHD Line
  - NHD Area
  - Catchment
  - Subwatershed (HUC12)
- Light Gray Canvas



(2 of 3)

GNIS_NAME	Boise River
LENGTHKM	1.42
REACHCODE	17050114000360
FCODE	55800
COMID	23398919
FTYPE	ArtificialPath
Stream Level	3
Stream Order	6
From Measure	0.00
To Measure	100.00
Incremental Drainage Area Sq KM	2.58
Total Drainage Area Sq KM	6,974.98

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OWDI NHDPlus v2.1 Framework Datasets - Draft

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  - [x] Catchment
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- USGS National Map

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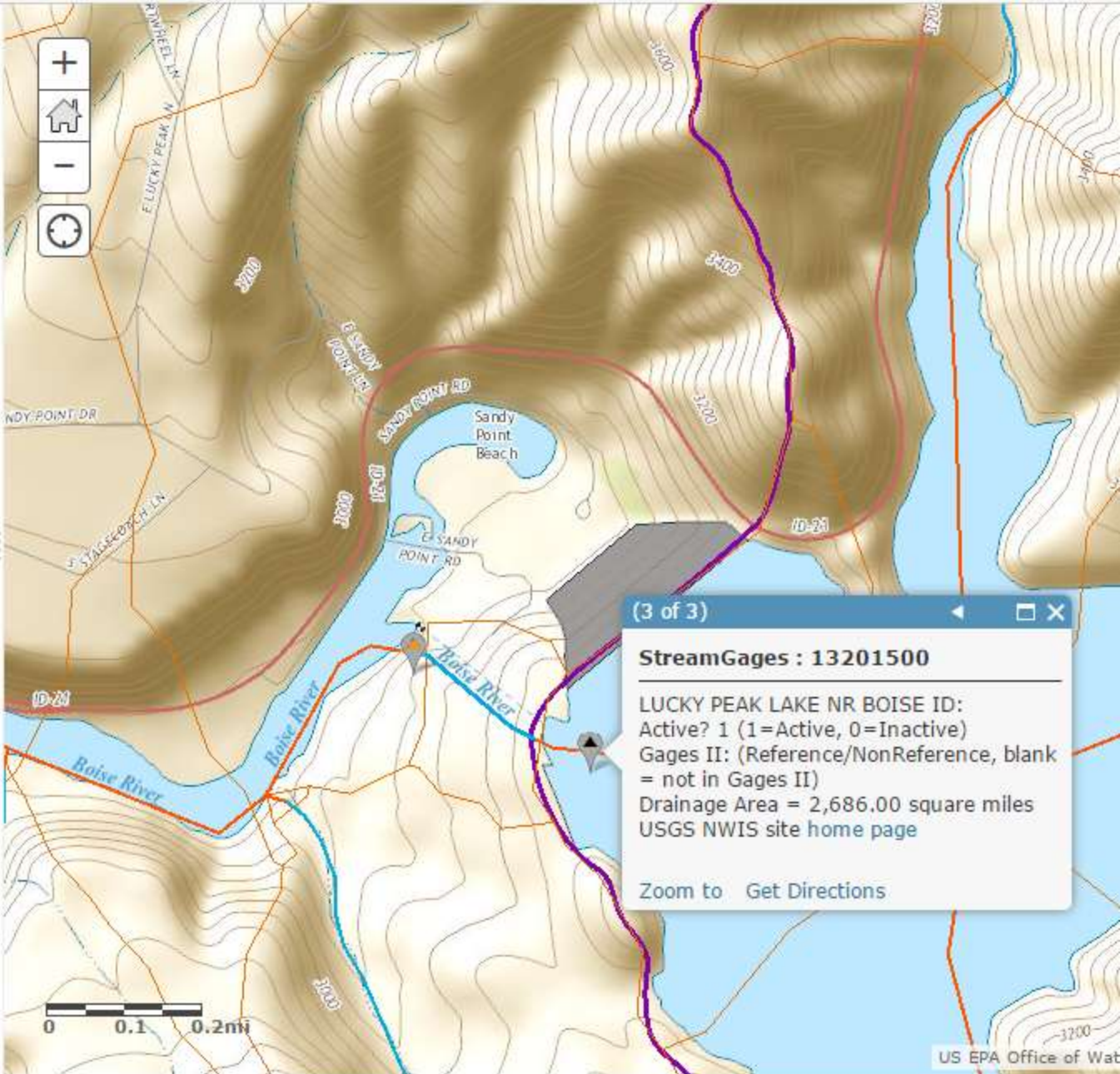

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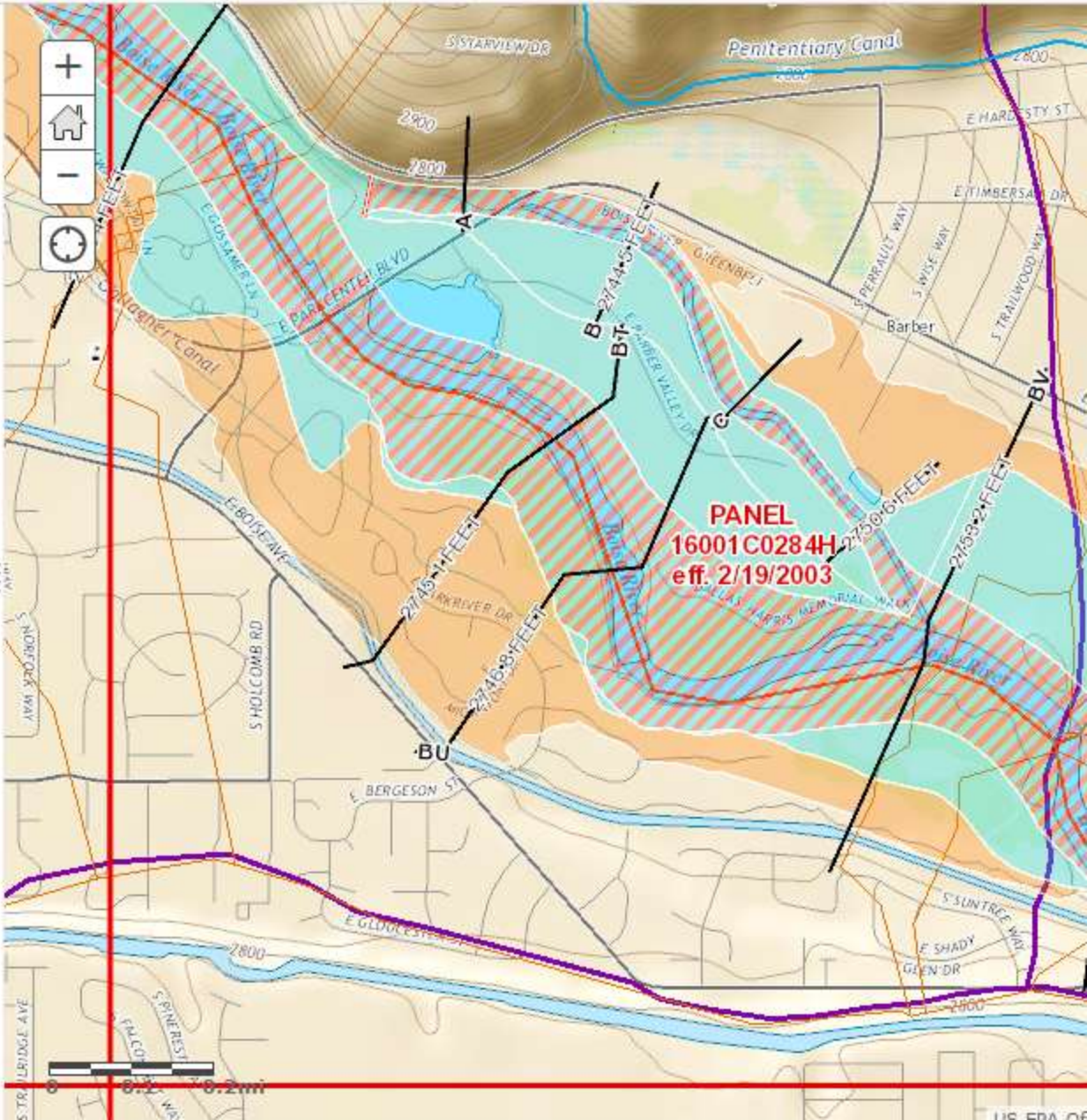
gend

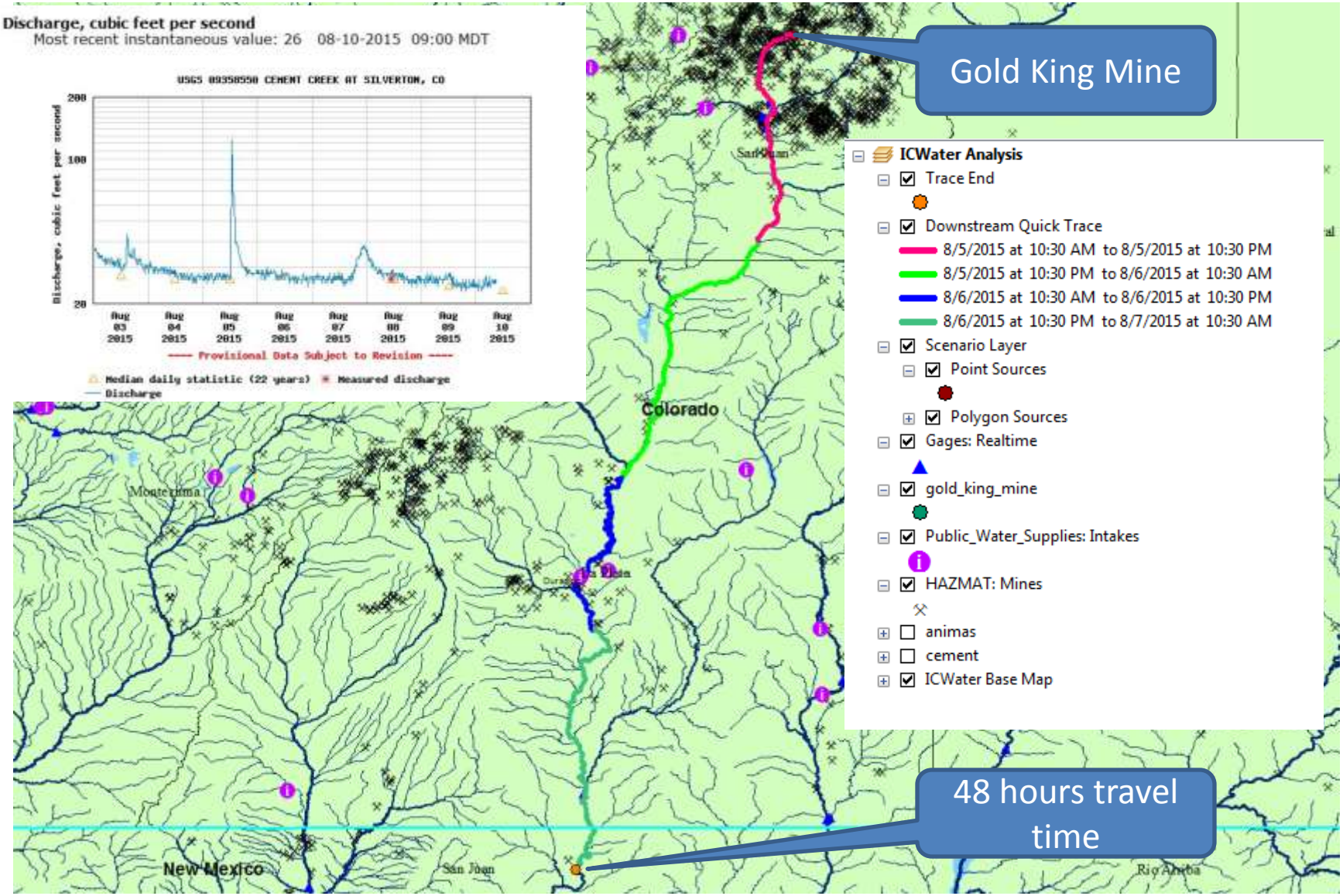
Layer

- LOMRs
- LOMAs
- FIRM Panels
- Base Index
- PLSS
- Toplogical Low Confidence Areas
- River Mile Markers
- Datum Conversion Points
- Coastal Gages
- Gages
- Nodes

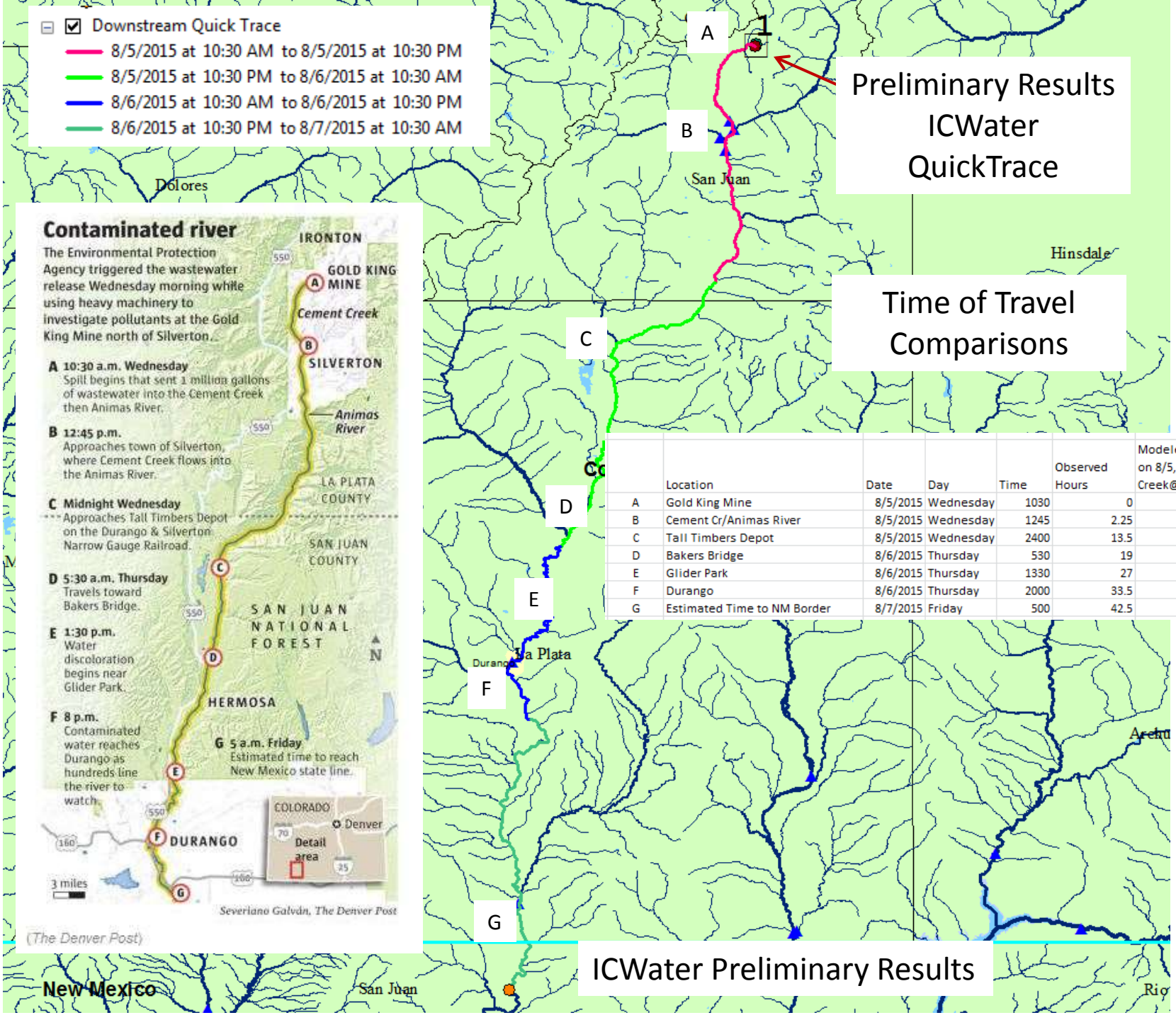


Gold King Mine Spill
ICWater Preliminary Results

ICWater Quick Trace – 48 hours, based on flow at Cement Creek at Silverton, CO

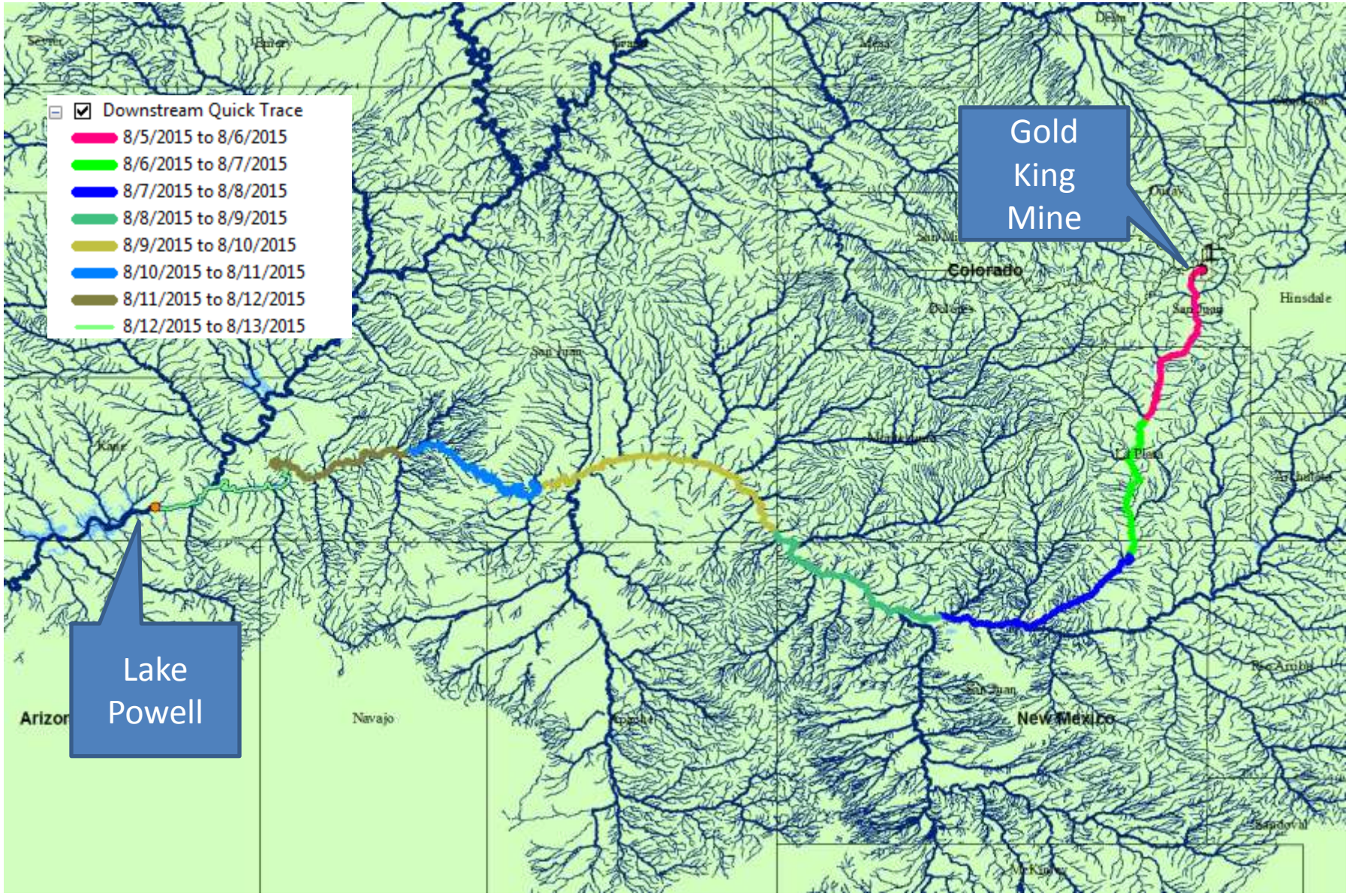


ICWater Preliminary Results



	Location	Date	Day	Time	Observed Hours	Modeled Hours (flow on 8/5, Cement Creek@Silverton)
A	Gold King Mine	8/5/2015	Wednesday	1030	0	0
B	Cement Cr/Animas River	8/5/2015	Wednesday	1245	2.25	5.7
C	Tall Timbers Depot	8/5/2015	Wednesday	2400	13.5	16.1
D	Bakers Bridge	8/6/2015	Thursday	530	19	21.1
E	Glider Park	8/6/2015	Thursday	1330	27	26.7
F	Durango	8/6/2015	Thursday	2000	33.5	33.4
G	Estimated Time to NM Border	8/7/2015	Friday	500	42.5	45.8

ICWater QuickTrace – 8 day travel time



ICWater Preliminary Results

For more information:

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