

# Los Alamos

NATIONAL LABORATORY

EST. 1943

Delivering science and technology  
to protect our nation  
and promote world stability

# Streamlining Stakeholder Data Accessibility Utilizing Web-Based GIS Capabilities - 18672

**WM2018 Conference, March 18 – 22, 2018,  
Phoenix, Arizona, USA**

**Nita P. Patel  
Program Manager  
Los Alamos National Laboratory**

March 20, 2018



Operated by Los Alamos National Security, LLC for the U.S. Department of Energy's NNSA

# Agenda

March 20, 2018

1:50 PM – 5:00 PM

Phoenix, Arizona



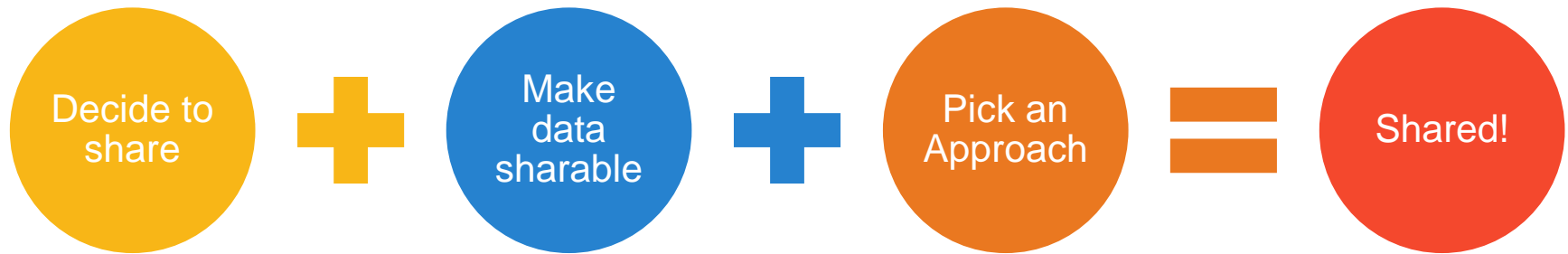
- **INTRODUCTION**
- **DATA ACCESSIBILITY AND ITS UNDERLYING BARRIERS**
- **SOLVING THE ACCESSIBILITY CHALLENGE**
- **THE APPROACH**
  - Redesigning Data Access
  - Simplifying access to complex data
  - Enhancing Understanding and Ensuring Data Integrity
  - Enhancing and Automating Spatial Visualization
- **REAL EXAMPLES**

# Backstory

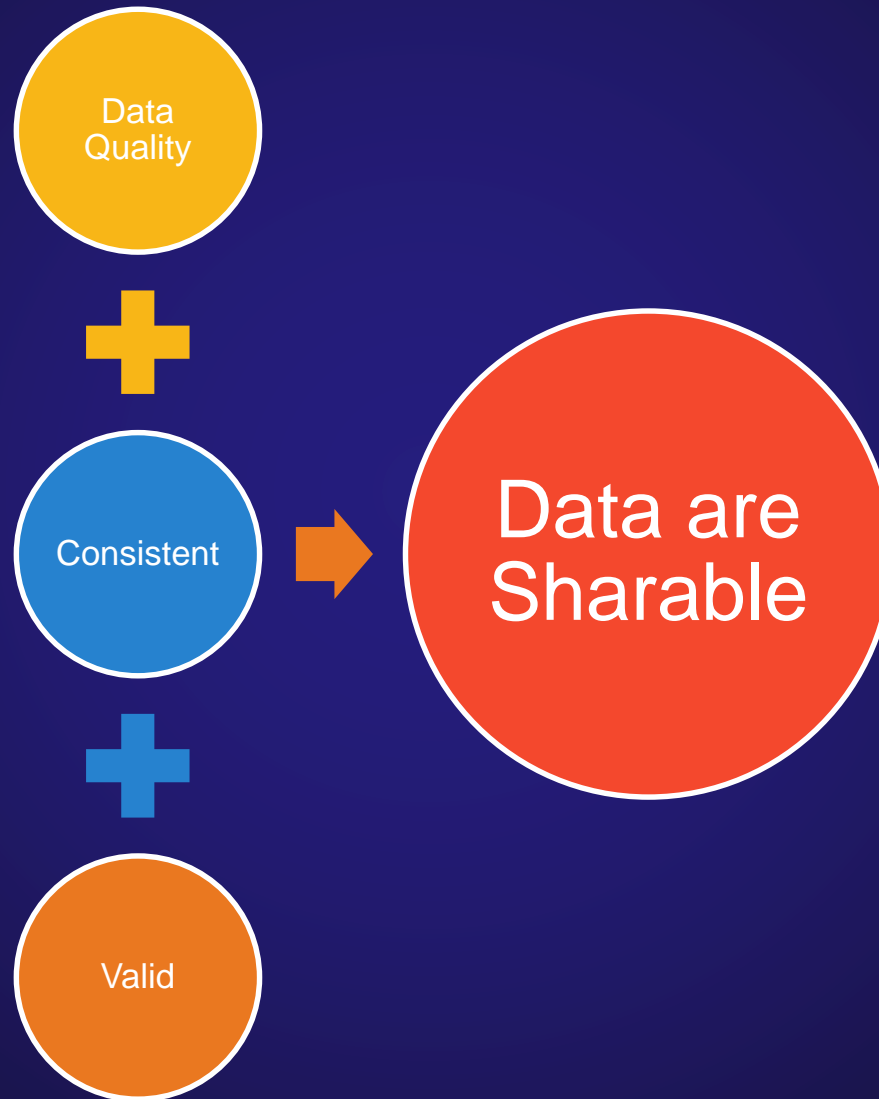
- **Intellus (<http://www.intellus.com/>) has been providing public access to environmental data from LANL for 6 years**
- **However, environmental data is highly complex, and it is challenging to provide proper context to the raw data**
- **The size and complexity of the DOE sites makes spatial resolution of data queries challenging for the layperson**
- **A larger challenge is trying to serve broadly diverse users from a single website interface**
  - DOE
  - State regulators
  - Laypersons
  - Stakeholders
  - LANL technical staff

***To make data sharing effective, address challenges head on***

# Addressing the data accessibility challenge



# Data has to be in sharable condition



# For Shared Data: Identifying the underlying barriers to accessibility

- Over 17.5 million environmental records
- 30,743 locations grouped into 357 “groups” of locations and classified into 38 location types
- Two different data providers (LANL and NMED)
- 1,735 analytical parameters grouped into 24 parameter groups
- 134 action limits (regulatory exceedance criteria)
- Approximately 300,000 field samples since 1942 classified into 65 sample types
- Approximately 500 wells and 475 surface water sampling locations
- An average of about 3,000 sample plans per year

# Shared! But now what?

- Stakeholders can see the data > Questions and confusion > created its own set of problems – training, questions, etc.
- Just sharing was not the entire solution for transparency > we needed to help guide users to intelligently query data (meaning and context)



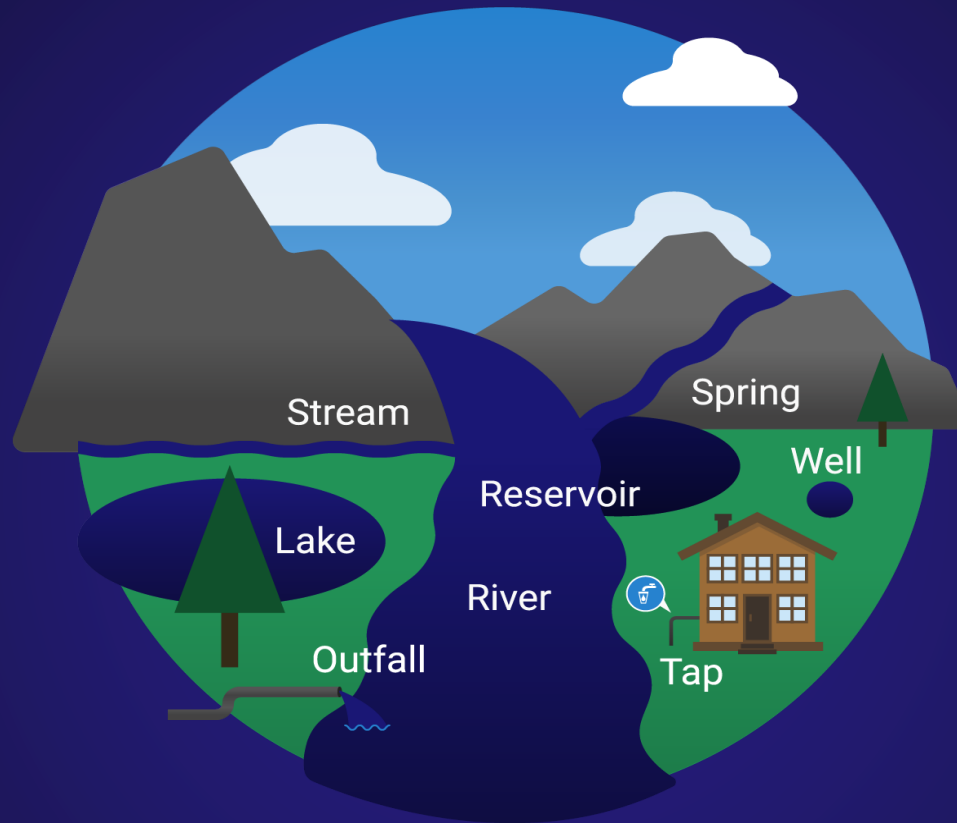


# Removing barriers

- **Redesigned data access to simplify and guide the selection of relevant data for a wide selection of users**
- **Enhanced and automated spatial visualization of the data to facilitate review and understanding, by presenting data within a geographic context**

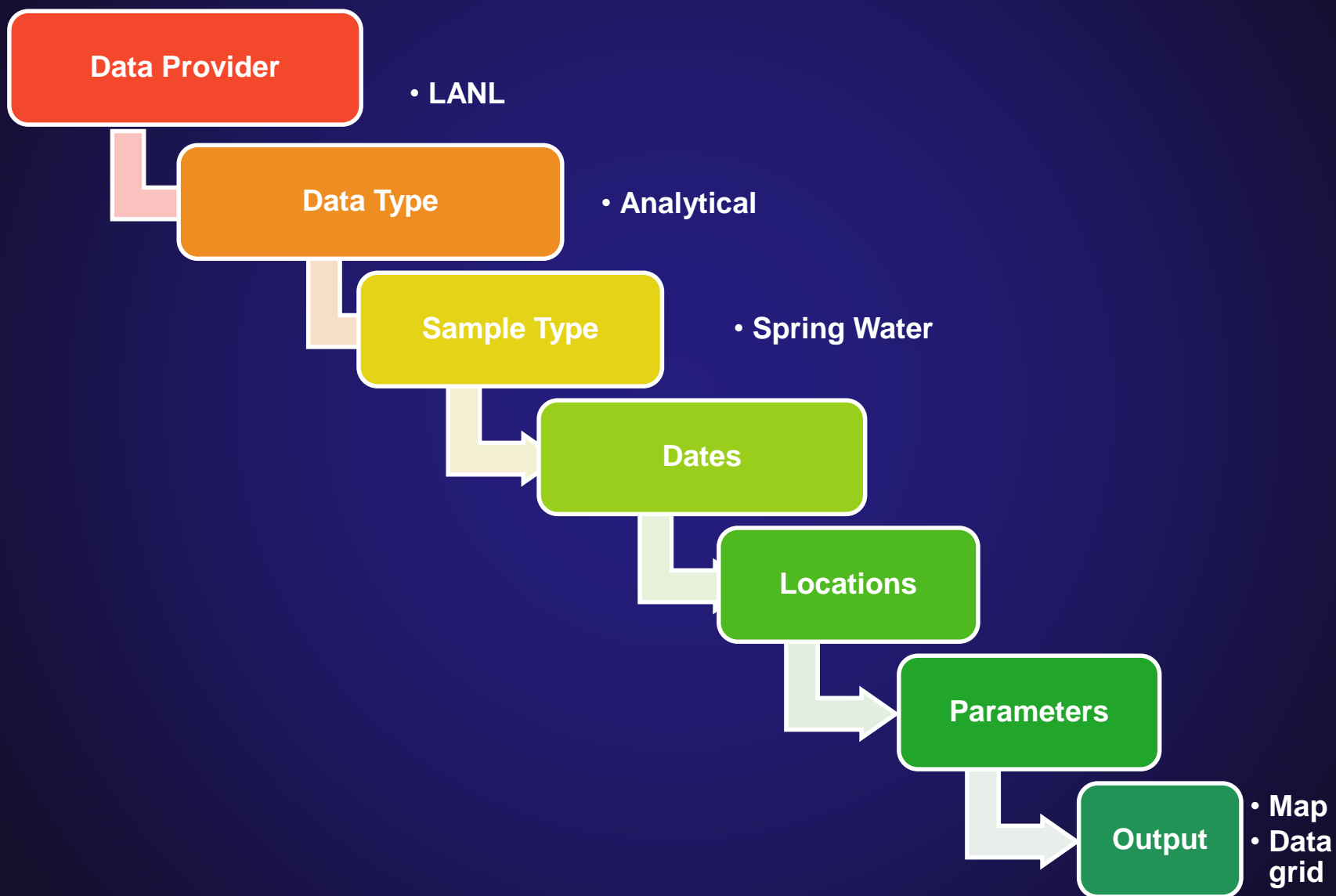
i.e., we made it easy to query and automatically download the data to maps and tables

# Making Queries and Outputs Easy and Correct



**Water, water everywhere, but which one is the correct one to query?**

# Quick Path Approach through the Intellus database



# Step by step guidance for better outcomes

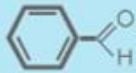
 Quick search 

[Start a new search](#)

1 [Data provider](#)

LANL 

2 What type of data are you looking for?



Analytical results



Field measurements



Groundwater levels




Precipitation  
measurements

[Continue >](#)

3 [Sample types](#)

 Water 

4 [Dates](#)

11/22/2012 - 11/22/2017 

5 [Locations](#)

6 [Analytical parameters](#)

7 [Data columns](#)

Results

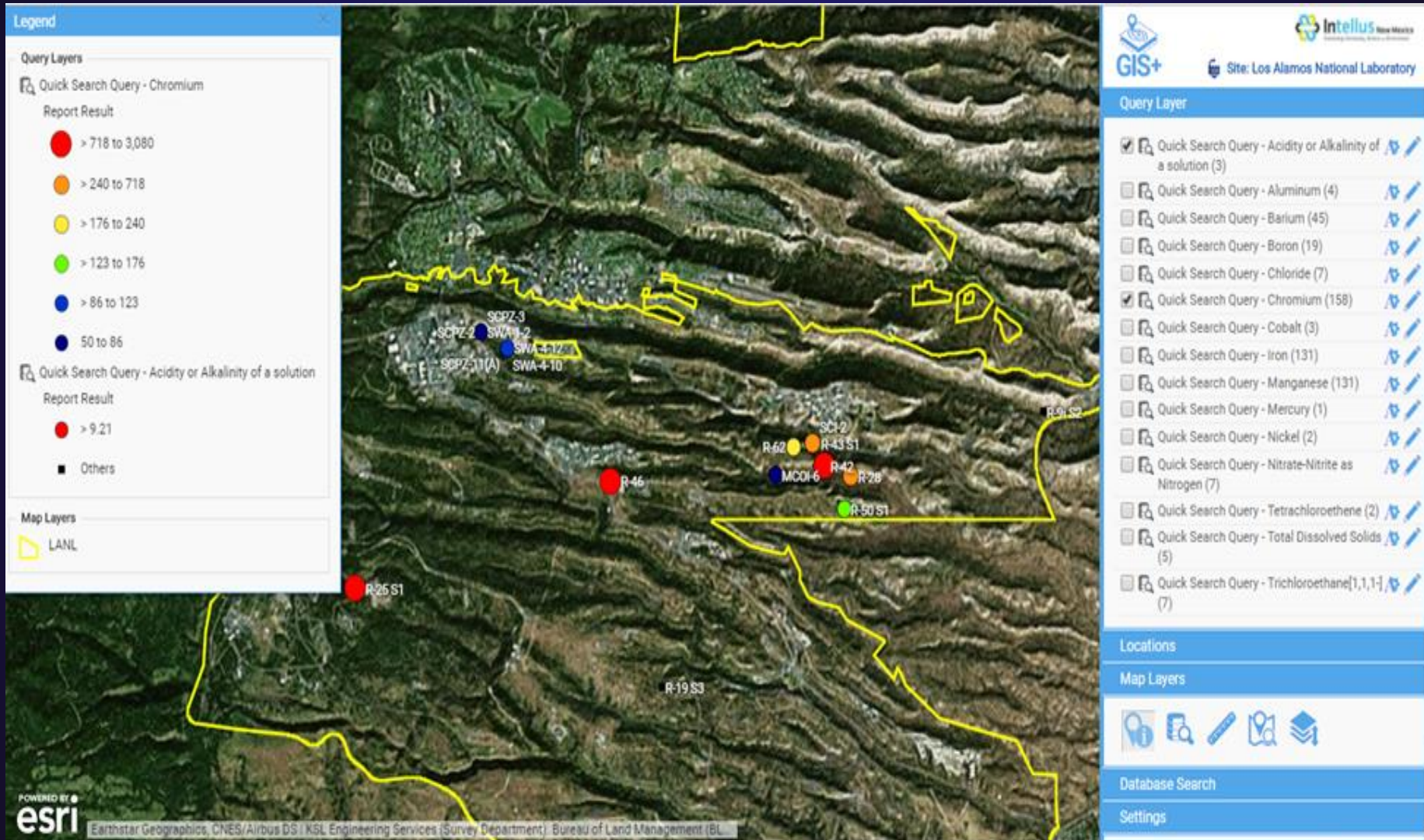
# Automatic and flexible outputs allow a multitude of options

The screenshot displays a data application interface with a table of results and an 'Export options' dialog box. A red box highlights three buttons at the top: 'View results on a map', 'Save query to myIntellus', and 'Download results'. The 'Download results' button is highlighted with a blue arrow pointing to the 'Export options' dialog. The dialog shows 'Export type' set to 'Excel', with a dropdown menu open showing options: 'Excel', 'CSV', 'Delimited', 'XML', 'PDF', 'Copy to Clipboard', 'Shapefile', and 'KMZ (KML with symbols)'. The 'Export' button is visible at the bottom right of the dialog.

Site ID	Location Group Name	Sample Type	Hydrostratigraphic Unit	Location ID
LANL	BLMWaters	WT		M-SMA-1 at SS121236
LANL	Individual Permit	WT		M-SMA-1 at SS121236
LANL	Individual Permit NM0030759	WT		M-SMA-1 at SS121236
LANL	IP 2017	WT		M-SMA-1 at SS121236
LANL	IP_Mortandad	WT		M-SMA-1 at SS121236
LANL	LANL Property	WT		M-SMA-1 at SS121236
LANL	sm-winward_task3	WT		M-SMA-1 at SS121236
LANL	SWTS_IP and FFCA	WT		M-SMA-1 at SS121236
LANL	TA-03	WT		M-SMA-1 at SS121236
LANL	BLMWaters	WT		M-SMA-10
LANL	Individual Permit	WT		M-SMA-10
LANL	Individual Permit NM0030759	WT		M-SMA-10
LANL	IP 2017	WT		M-SMA-10

Page 1 of 56 | 20 | View 1 - 20 of 1,120

# Example of Automatic map download



# Re-organization of data to understand the complexity

- Logical groupings to streamline large data sets
- Pop-up Values of definitions
- Consistent and meaningful valid values ("look up values")

Group Name ↑	Description
<a href="#">Intermediate Aquifer historica</a>	Intermediate Aquifer
<a href="#">Intermediate Spring historical</a>	Intermediate Spring
<a href="#">Intermediate Springs</a>	The Intermediate Springs Location Group consists of a network of spring sampling locations where the source is perched intermediate groundwater. Intermediate springs are located in the canyons and are routinely monitored for specific chemical constituents and radionuclides under the LANL site wide monitoring program. Refer to the area-specific or general surveillance monitoring groups for the current springs sampling locations. Updated 8/28/17.

Available location groups (122)

Type to filter options...

- air\_er-perimeter
- air\_er-pueblo
- air\_er-regional
- Alluvial Springs
- Alluvial Wells
- Area G
- Base Flow
- Cr Inv Monitoring Group
- DARHT
- Gen Surv Monitoring Group
- GW Dataset NMED DOE OB 2017
- Individual Permit NM0030759
- Intermediate Springs
- Intermediate Wells

Selected location groups (0)

Alluvial Springs Location Group consists of a monitoring network of springs where the source is alluvial groundwater. Alluvial springs are located in the canyons and are routinely monitored for specific chemical constituents and radionuclides under the LANL site wide monitoring program. Refer to the area-specific or general surveillance monitoring groups for the current springs sampling locations. Updated 8/28/17.

# Enabling better understanding using GIS+

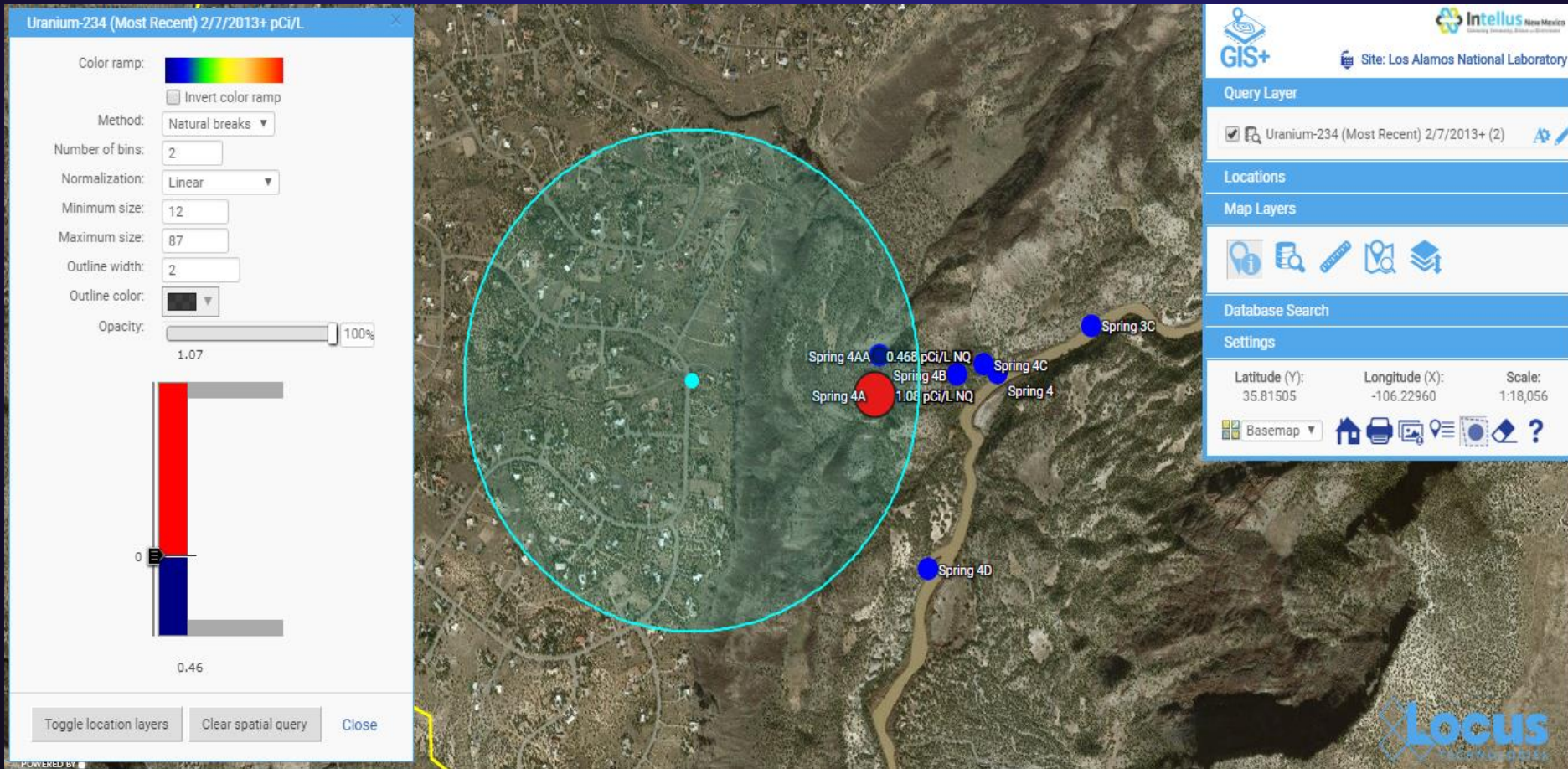
✓ Automatic

✓ Easy

✓ Integrates with maps

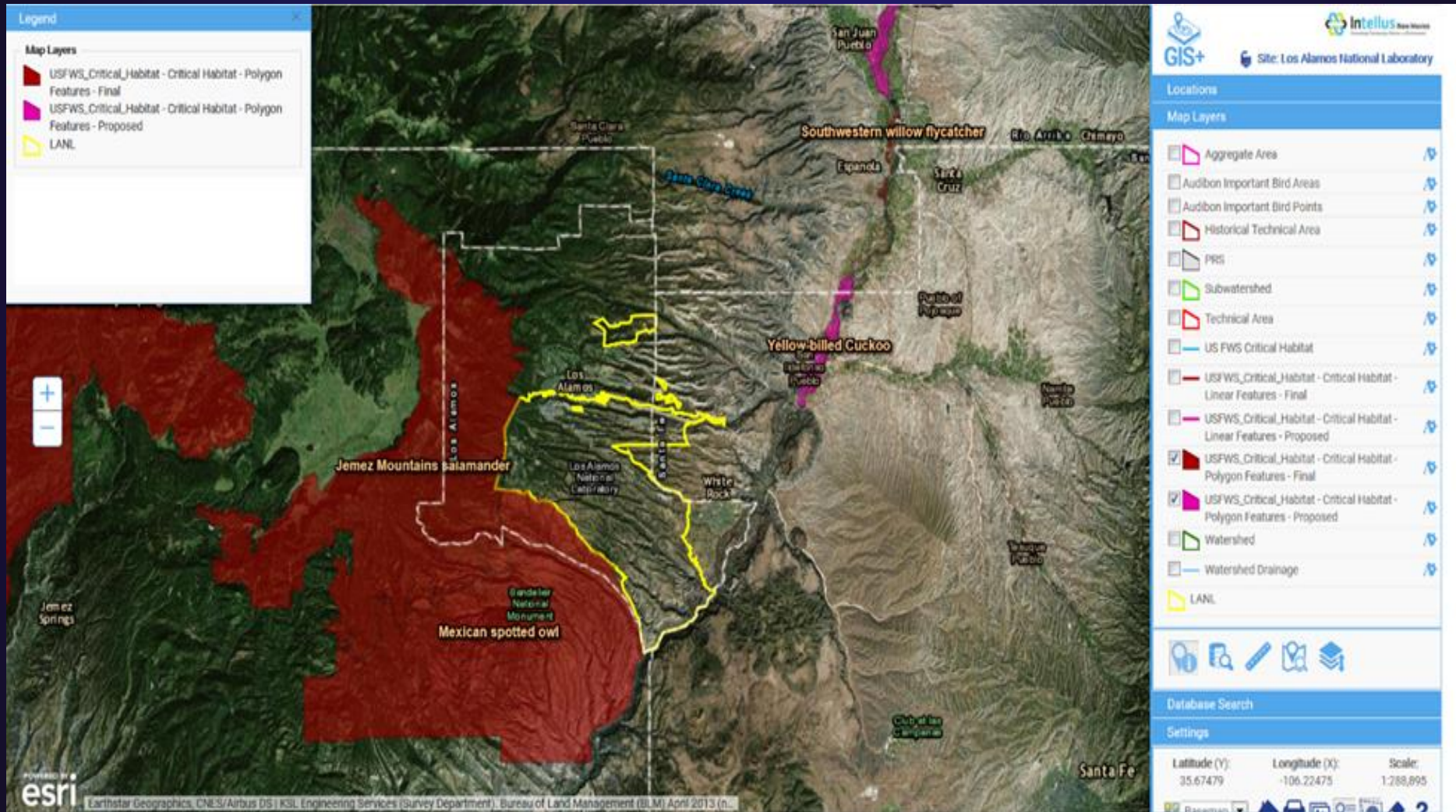
✓ Built in Tools

✓ Little training required





# LANL + US Fish and Wildlife = New meanings and context



# For more information

**Nita Patel**

**Los Alamos National Laboratory**

**[npatel@lanl.gov](mailto:npatel@lanl.gov)**

**Todd Pierce**

**Locus Technologies**

**[PierceT@locustec.com](mailto:PierceT@locustec.com)**

**Sean Sandborgh**

**Locus Technologies**

**[Sandborghs@locustec.com](mailto:Sandborghs@locustec.com)**

**Marian Carr**

**Locus Technologies**

**[carrm@locustec.com](mailto:carrm@locustec.com)**