



Environmental Data Management at Los Alamos National Laboratory

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Dr. Sean Sandborgh, Dr. John Garrett, Helen Westbrook, Paul Mark, William
Donaldson, Angelica Maestas, Corey White*

** -- Presenter*

Driving Cleanup ▪ Honoring the Past ▪ Strengthening Communities

- Introduction
- Data Management Challenges
- Data Management Strategy
- Environmental Information Management (EIM)
- IntellusNM
- Locus Mobile/Other Field Data
- Conclusions





- **Newport News Nuclear BWXT-
Los Alamos, LLC (N3B)**
 - Owned by Newport News Nuclear, a division of Huntington Ingalls Industries, and BWX Technologies
 - Implements the Los Alamos Legacy Cleanup Contract (LLCC) for the U.S. Department of Energy, Environmental Management, Los Alamos Field Office (DOE EM-LA)

N3B's primary responsibility is to characterize, manage, and clean up legacy waste and contamination at Los Alamos National Laboratory (LANL)

- Legacy waste:
 - Generated before 1999
 - Includes radioactive material from the Manhattan Project and Cold War
- Legacy contamination:
 - Released into the environment before 1999
 - Soil, groundwater, surface water, sediments, pore gas, demolition and decommissioning

- N3B collects annually (plus total number of database records):
 - 2,000 Locations (~38,000 total)
 - 10,000 Samples (~245,000 total)
 - >600 Analytical Parameters (~2,000 total)
 - 1,000,000 Groundwater Levels (>8M total)
 - >55,000 Field Measurements (>540,000 total)
- Resulting in:
 - ~3.5M records annually added
 - 33M total records as of 10/1/2025

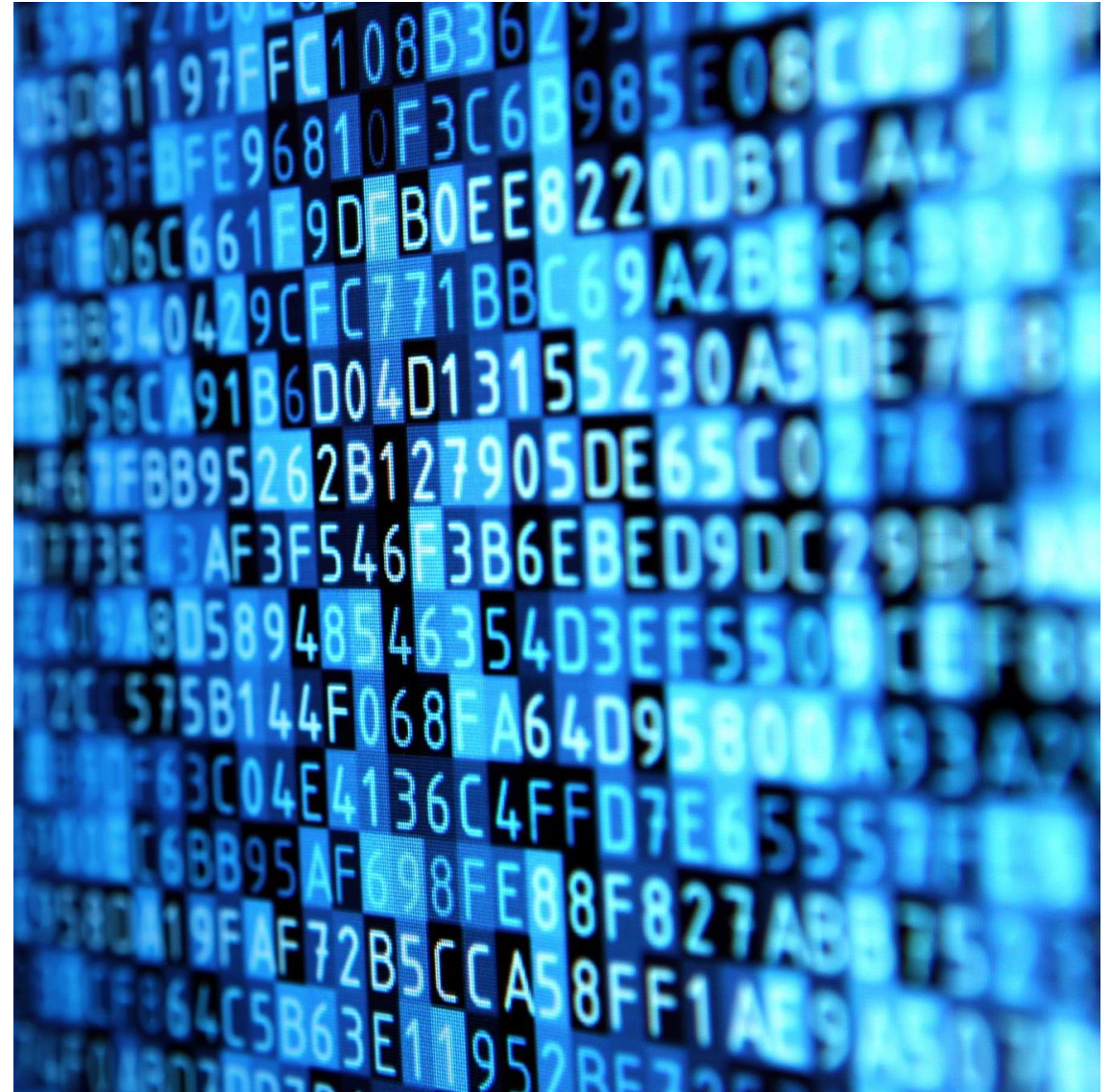




- How do we deal with the huge amount of environmental data that is being generated?
- Let's look at the history of environmental data management in general:
 - Prior to 1980s – Paper!
 - 1980s-1990s – Home-grown project-specific Excel, Access, SQL, Oracle, etc., worksheets/databases
 - Late 1990s-today – Site-wide (or larger!) environmental databases, both home-grown and commercial solutions
- Generally, transitions between different data management strategies are complicated, expensive and can be long-duration processes, often with significant resistance from end-users
 - This is especially true for large sites with long histories (e.g. DOE sites)

Data Management Challenges

- Prior to 2011, LANL managed all its environmental data in fragmented project-specific data structures
 - 2 large scale databases that had been semi-consolidated in the 2000s (water and soil)
 - ~5 medium scale project-specific databases (stack air, ambient air, sediments, etc.)
 - Dozens of project-specific Excel and Access files, many containing data not present anywhere else



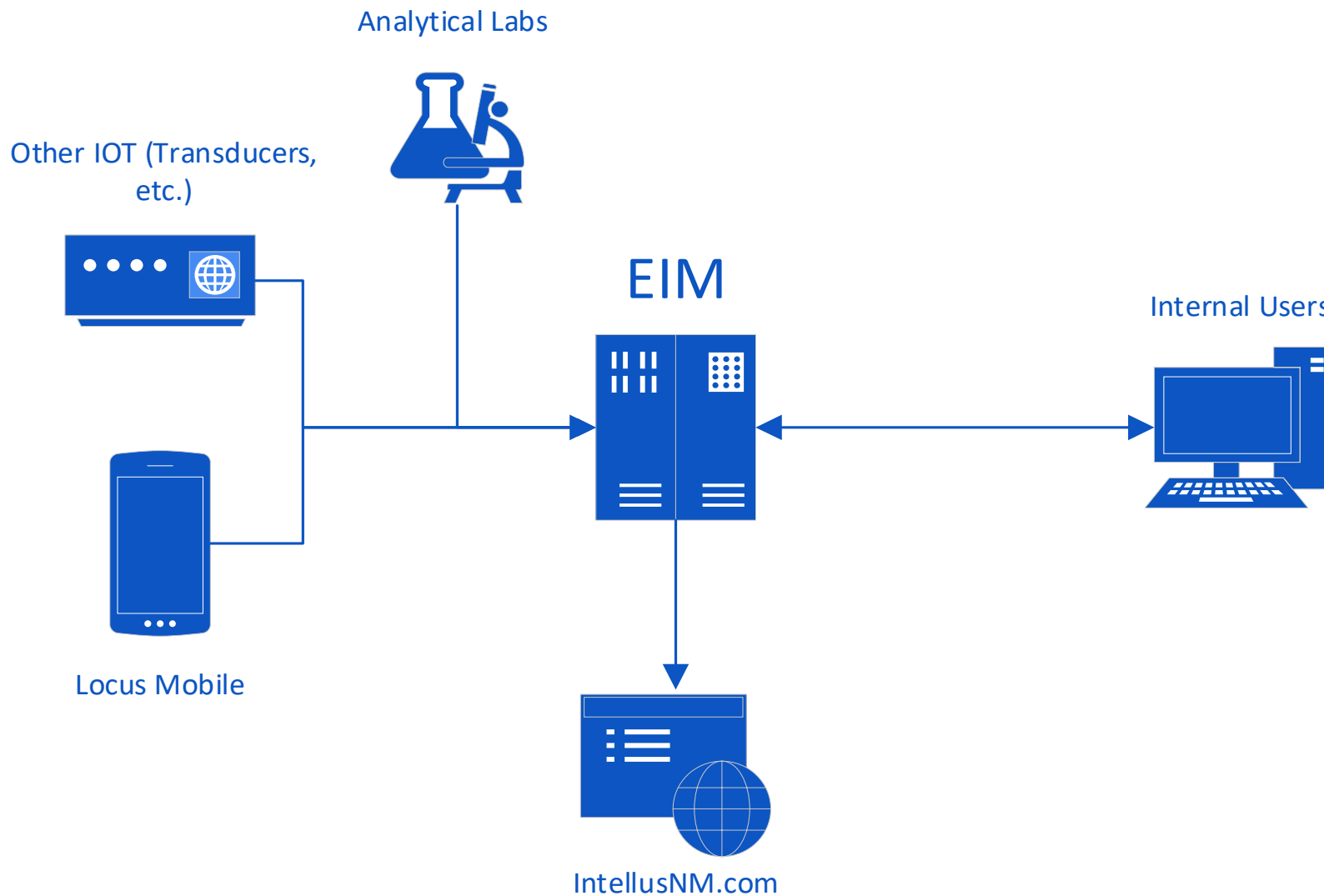


- Challenges:
 - Where's my data?
 - Duplicate or missing data?
 - Data syncing?
 - Software quality assurance (SQA)?
 - Version control?
 - Everything's custom

Data Management Strategy

- Cloud-based software provided by Locus Technologies
 - Adopted in 2011 by LANL
- EIM – Main database for internal use
- Locus Mobile – Field data collection iOS application tool
- IntellusNM.com – Public portal to the data stored in EIM
- Co-managed by all three LANL site data providers:
 - N3B (DOE EM)
 - Triad National Security, LLCC (DOE NNSA)
 - New Mexico Environment Department, DOE Oversight Bureau





The screenshot shows the EIM Project Manager Console web application. The browser address bar displays www.locusfocus.com/eim/home_alt.cfm. The top navigation bar includes the Los Alamos National Laboratory logo, a search bar, and menu items for Setup, Field, Input, Analysis, Reporting, Visualization, and Extras. A secondary navigation bar shows user information: Settings, Support, Sean Sandborgh, Los Alamos National Laboratory, and Site: N3B LANL (N3B).

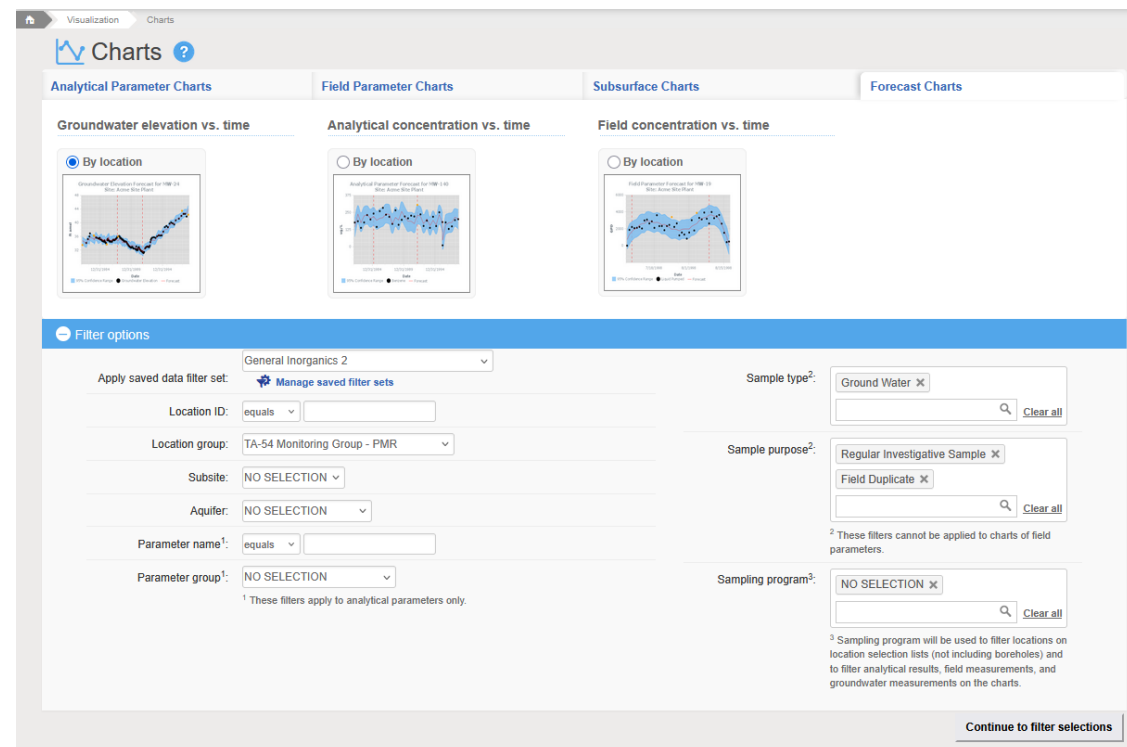
EIM Project Manager Console

The console is divided into three main sections:

- Analyze:** Contains sub-sections for Analysis (New Maxima/Hits: Last 90 Days, Summary Statistics, Mann-Kendall Test For Trend) and Quick Views (Chemistry (Basic), Chemistry (Expanded), Samples, Locations, Groundwater Elevations, Field Measurements).
- Visualize:** Contains sub-sections for Charts (Chemistry: One Well & Multiple Chemicals (Example), Chemistry: Multiple Wells & One Chemical (Example), Exceedance: Up To 10 Locations and One Limit (Example), Groundwater Elevation (Example)) and Quick GIS (Open map, You have no saved maps, Other users' public maps: Bio Review Map, StormwaterGene, Soil Samples).
- Report:** Contains sub-sections for Activity (Record Counts, EDD Loading Metrics for Consultants, Reporting Tool Usage, Site Activities Calendar), Quick Reports (No available Quick Reports were found), and Quick Queries (Crossref_CC_Sample_N3B, Field Data Search).

Footer information includes: Terms of Use | Privacy | Security | Powered by Locus Technology | Problems or suggestions? | Total Records in EIM: 449,987,916

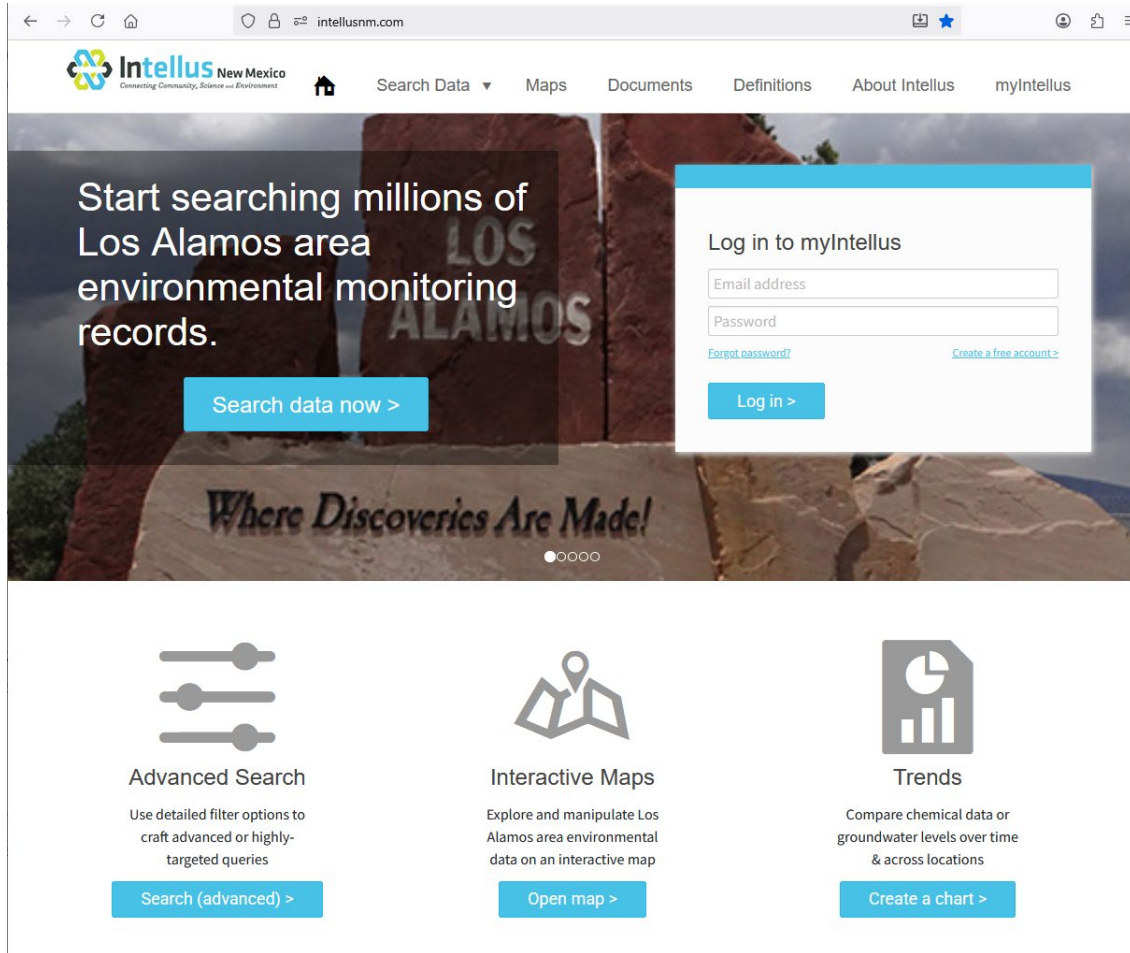
- Always available cloud-based access
- Granular permission schema protects data from unauthorized or accidental edits or misuse
- Standard and custom queries, reporting and charting
- ESRI-powered GIS module available to all users
- All data present in a single database available to all users
- SQA and version control



Why is it important that all data is together?

Let's look at an example of consolidated data providing efficiencies and increased value:

- Waste Data Summarization and Characterization



- Public facing data portal
 - Fulfills DOE’s data public transparency obligations
 - Cloud-based system provides continual read-only access
 - Contains same data present in EIM within 24 hours of loading
 - No username or password required to search (used only for saving queries)
 - Has many of the same tools present in EIM (GIS, charting, reports, queries)

- Locus Mobile app wirelessly interfaces with EIM to collect and upload field data
- Configurable entry screens simplify data entry
- No additional transcription steps from paper
 - Less work
 - Fewer errors
 - More rapid data availability





- Other data also feed into the unified data management process
 - Well transducer water level data
 - Test kit results
 - Pore gas sample container masses
 - Radiological screening values
 - Volatile organic PID field readings



LANL's data management strategy involves consolidation of all environmental data into as few data structures as possible (i.e., EIM)



Data consolidation allows for realizing additional efficiencies by having everyone looking at the same data, using standardized reporting and analysis features and providing more consistent access



Moving to one unified system allows for improved confidence in the SQA and version control of the overall data landscape



LANL's data transparency obligations are fulfilled seamlessly through a cloud-based public facing portal to the same data structure

N3B *Los
Alamos*