

UTILIZING QLIK TO VISUALIZE THE MULTIAGENCY SPATIOTEMPORAL DATA DRIVING EFFECTS-BASED MONITORING



Wilson Melendez

wilson.melendez@gdit.com

Scientist senior, modeling and simulation specialist supporting EPA Office of Research and Development, SMAVC3.



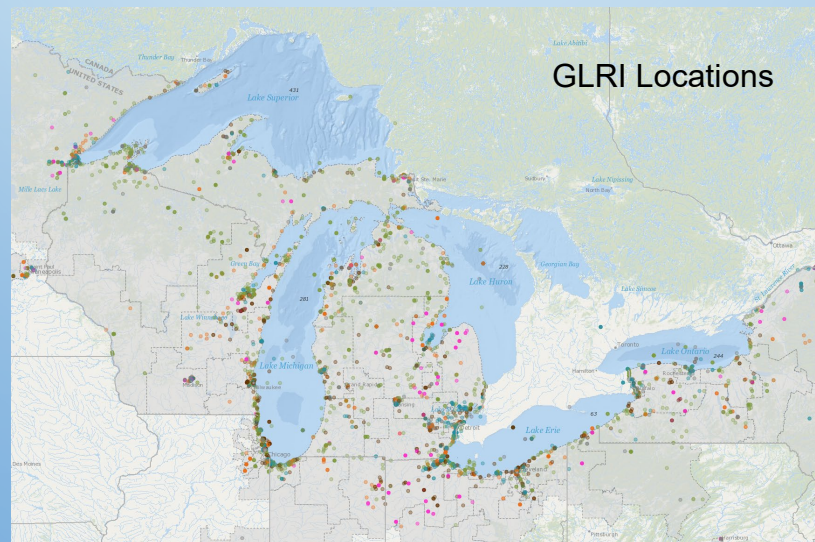
Jonathon Launsbach

jonathon.launsbach@gdit.com

Project manager, GIS specialist and data analyst supporting EPA Office of Research and Development, SMAVC3

BACKGROUND

- The Great Lakes Restoration Initiative (GLRI) is a white house driven enterprise that began in 2010.
- Its main goals are the protection and restoration of the Great Lakes.
- One of the components of GLRI is the Effects-based Monitoring (EBM) program whose aim consists of the following goals:
 1. Identify Contaminants of Emerging Concern (CEC).
 2. Assess the adverse impact of legacy contaminants and CECs on great lakes fish and wildlife.
 3. Establish spatial and temporal monitoring of CECs.



RESEARCH GROUPS

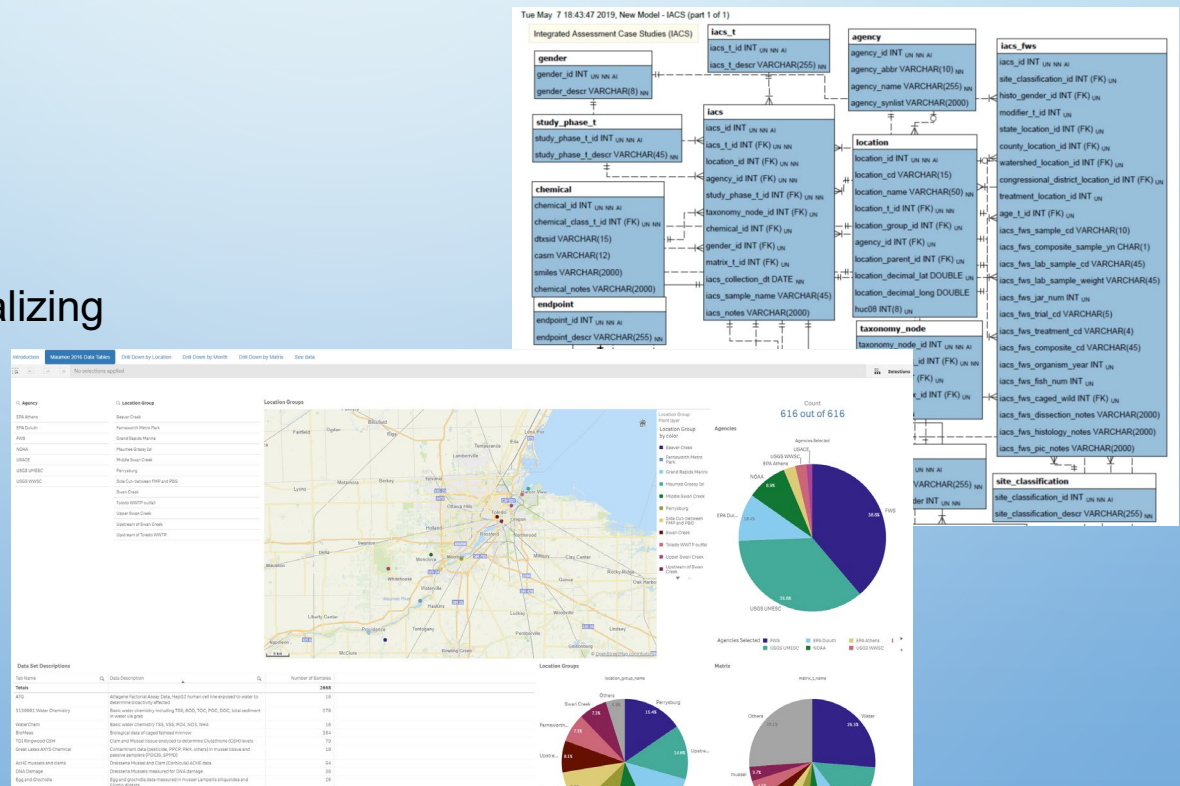
- To address these issues, a research group with technical expertise in different areas of monitoring/surveillance and assessing contaminant mixtures was assembled.
- This research group includes federal agencies and universities:
 1. USEPA
 2. NOAA
 3. USGS
 4. USFWS
 5. USACE
 6. Clarkson University
 7. St.Thomas University
 8. St. Cloud State University



GDIT SUPPORT TO EBM GROUP

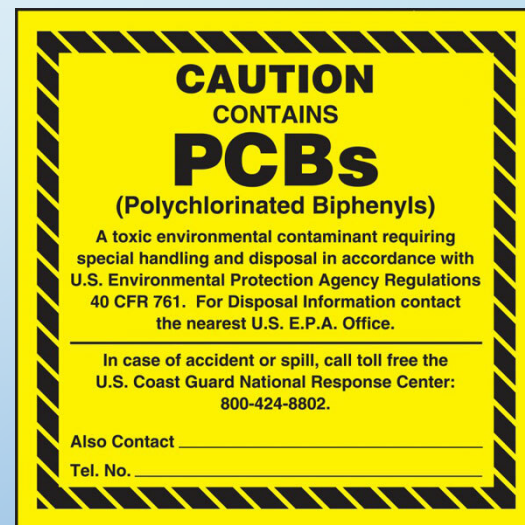
GDIT was contracted to support the EBM group. Support involves tasks such as:

1. Cleaning (account for missing data, outliers, data quality codes, etc.)
2. Assembling
3. Merging
4. Extracting
5. Synthesizing
6. Interpreting/Visualizing



CHEMICALS OF INTEREST

- Legacy chemicals:
 1. Polychlorinated Biphenyls (PCBs)
 2. Polycyclic Aromatic Hydrocarbons (PAHs)
 3. Metals
- CECs:
 1. Pesticides
 2. Brominated flame retardants
 3. Biogenic hormones
 4. Pharmaceuticals
 5. Personal care products
 6. Plasticizers
 7. Detergents

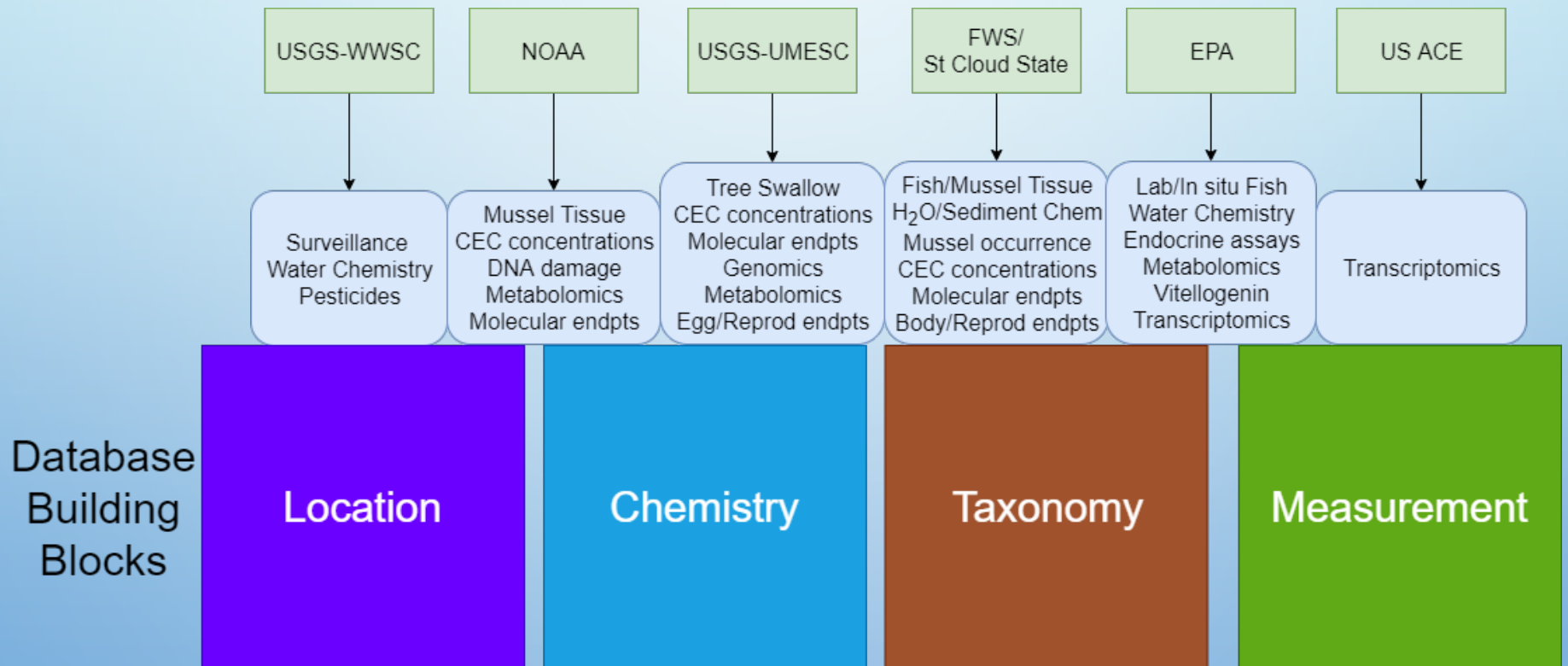


INFORMATION IN DATASETS

Information in submitted datasets include:

- a) Various metadata
- b) Instrumental measurements of concentrations of parameters such as:
 - I. Contaminants in surface water
 - II. Passive samplers
 - III. Sediments collected using different analytical schedules that, in total, may detect several hundred chemicals in each sample.
- c) Chemical residue concentrations in tissues of mussels and birds.
- d) In vitro targeted (single assay), or non-targeted high-throughput (HTP) data capturing 50-100 measures of bioactivity (per sample) associated with different biological pathways (e.g., Estrogens).

DATABASE CONSTRUCTION

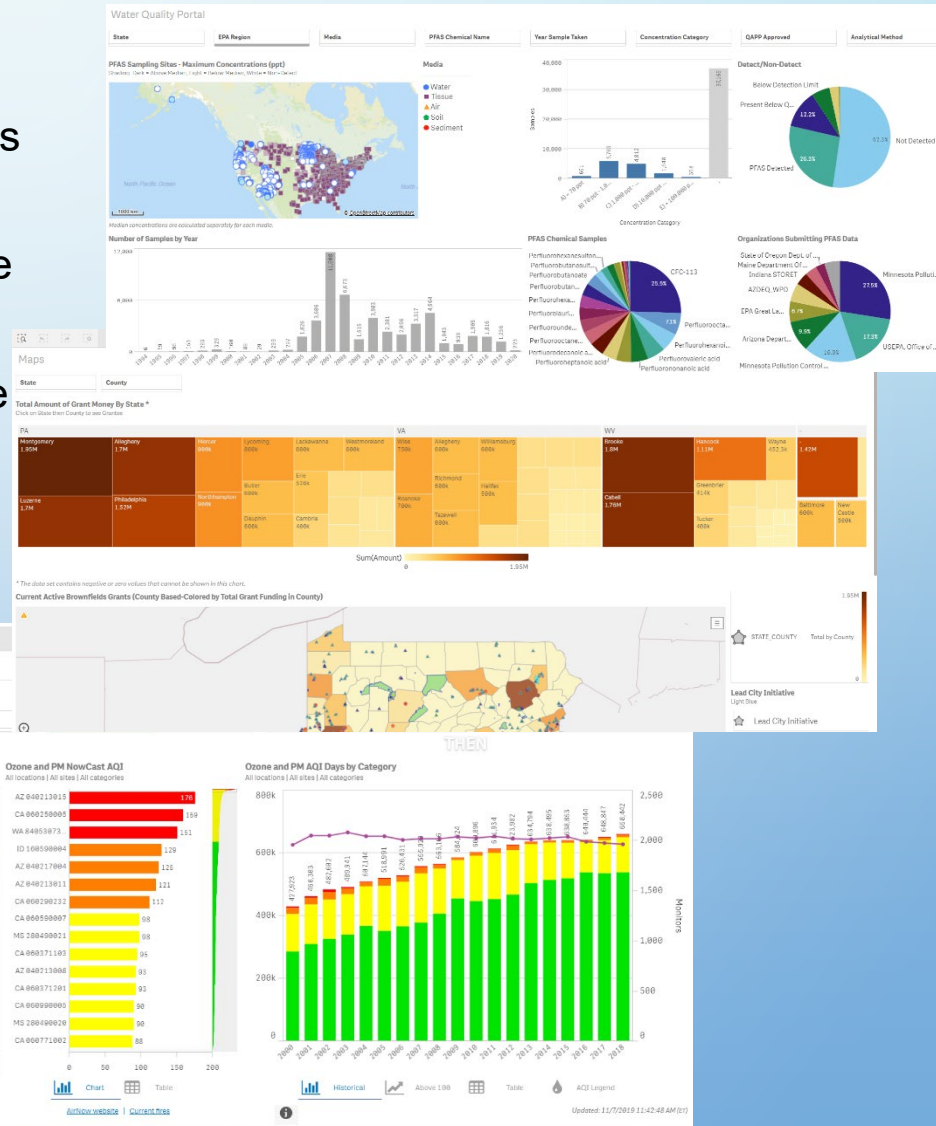


WHAT IS QLIK?



<https://www.qlik.com/us/>

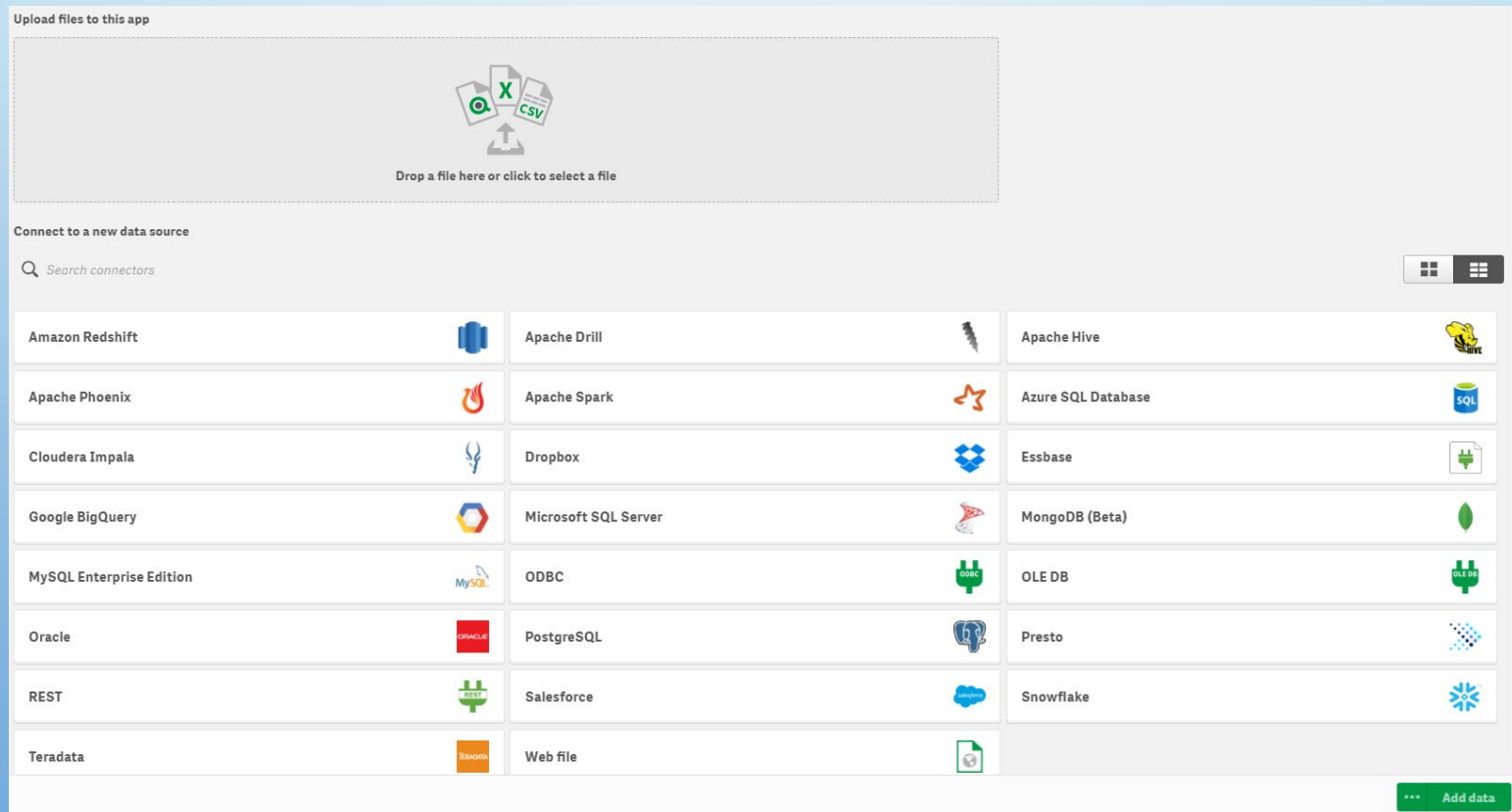
- Powerful data visualization tool (Tableau, Power BI, SAS)
- Create dashboards with multiple graphs, tables and maps
- Dynamically interact with the graphs to explore your data
- Apply selections or filters /expressions and the graphs update instantly
- Useful for exploring large data sets



WHAT IS QLIK?(CONTINUED)



- Can connect directly to a variety of data sources and can also connect to multiple data sources at one time.
- Can be manually updated when new data is loaded or recurring updates (e.g. every 30 minutes, 6 hours).
- Export to table or image.



DEMO

Introduction

Maumee 2016 Data Tables

Drill Down by Location

Drill Down by Month

Drill Down by Matrix

See data

Great Lakes Restoration Initiative

Use the tabs along the top to switch between pages - You may experience slow initial application load time

Overview:

A collaborative effort to monitor and assess potential exposure and effects of Chemicals of Emerging Concern on aquatic and other wildlife in the Great Lakes Areas. Contaminants of Emerging Concern (CECs) The Great Lakes Restoration Initiative (GLRI) started in 2010 aimed at protecting and restoring the country's largest freshwater resource. One component of the GLRI involves consideration of the adverse impacts of complex mixtures of legacy chemicals and contaminants of emerging concern (CECs) on Great Lakes fish and wildlife. To address this issue, a multi-agency research consortium with technical expertise in the monitoring/surveillance of environmental contaminants and biological effects in ecologically-relevant species was assembled.

Partners:

Partners include scientists and resource managers from the U.S. Environmental Protection Agency, U.S. Geological Survey, National Oceanic and Atmospheric Administration, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers and several universities.

Approach:

The approach chosen by the team to address the multifaceted challenge of complex mixture assessment involves linking extensive analytical chemistry measurements to effects-based monitoring (EBM) data collected using different types of biological systems (Ekman et al. 2013).

The overall research effort includes:

- 1) systematic monitoring/surveillance at a large number of Great Lakes sites
- 2) more focused, intensive efforts at a limited number of high priority watersheds
- 3) controlled experimentation in the laboratory based on hypotheses generated from field observations

Through these studies, the consortium has and continues to generate a large amount of diverse chemical and biological data.

Use this link or see below

<https://communities.geoplatform.gov/glri/>

New to Qlik

If this is your first time using Qlik or you need a refresher please use links below and to the right to learn more.

Qlik is a powerful business intelligence software that allows users to transform data into actionable intelligence and automate workflows by connecting to thousands of data sources.

<https://awsedap.epa.gov/glri/extensions/GLRI/GLRI.html>



QUESTIONS?

RESOURCES

- More about our project - <https://communities.geoplatform.gov/glri/>
- More about Qlik - <https://www.qlik.com/us/>

CONTACT

- Jonathon Launspach - jonathon.launspach@gdit.com
- Wilson Melendez - wilson.melendez@gdit.com