Prototyping a Tool for Integrating Regional CEMS Data, Information and Quantifying Effects!

Robert Magai, PhD
Environmental Modeler

Science, Research and Innovation Section
Clean Energy Policy Branch
**ESRD**

Presented at the

Environmental Modeling Workshop
University of Alberta Lister Center
March 13 -14, 2013

Alberta
Freedom To Create. Spirit To Achieve.

Government of Alberta

Presentation Outline

- Objective

- Rationale and Benefits of CEMTool

- Methods for studying CEs

- Demo
  - GIS Interface and Visualization
  - Data Analytics
    - Excel app
    - R - Stats

- Summary and Next Steps

- Acknowledgements

- Discussion

Objective

Provide an overview of the cumulative effects analytical, evaluation and reporting tool
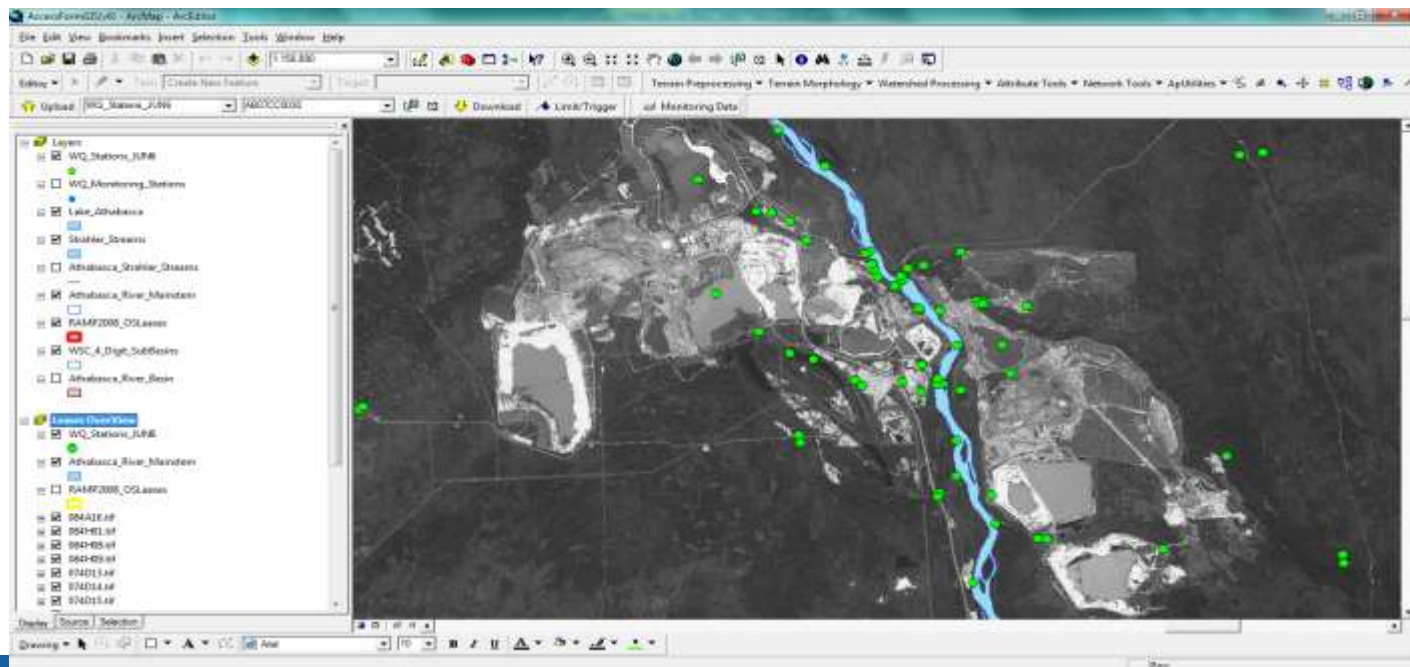
Rationale

- Rationale for developing CEMTOOL
  - Regional plans require tools to develop thresholds, limits and outcomes.
    - Cumulative impacts are data intensive
    - Outcomes need to be measured and evaluated continuously
      - Data compilation and assessment in near real-time is critical
  - Management frameworks all contain enhanced reporting requirements to the public
   - Require knowledge and information generation

Benefits

- Why the CEMTool may be useful in CEM
    - Consistent and specified data formats in a centralized warehouse
    - Tool for mapping, evaluation, visualization and reporting
    - Assist managers with site-specific decisions or decisions regarding geographic areas and communities adjoining the site
    - Expedite availability, use, storage, search and retrieval of data and permit sharing for concurrent or future purposes
    - Efficiencies gained free up scarce resources needed to pursue site and regional goals
    - Potential to better communicate environmental data to the public
    - Facilitate review and assessment of environmental impacts on regional scale
    - Merge regional data across programs to provide managers a holistic view of specific sites as well as geographic regions

Primary Methods for Studying CEs

- Overlay mapping and GIS
  - Incorporate locational information into CEs
  - Set boundaries of the analysis
  - Identify areas where effects will be greatest
- Trend analysis
  - Assess status of resources and/or ecosystems over period of time
  - Establish appropriate environmental baselines
  - Project future cumulative effects
- Modeling
  - quantify the cause and effect relationships leading to CEs
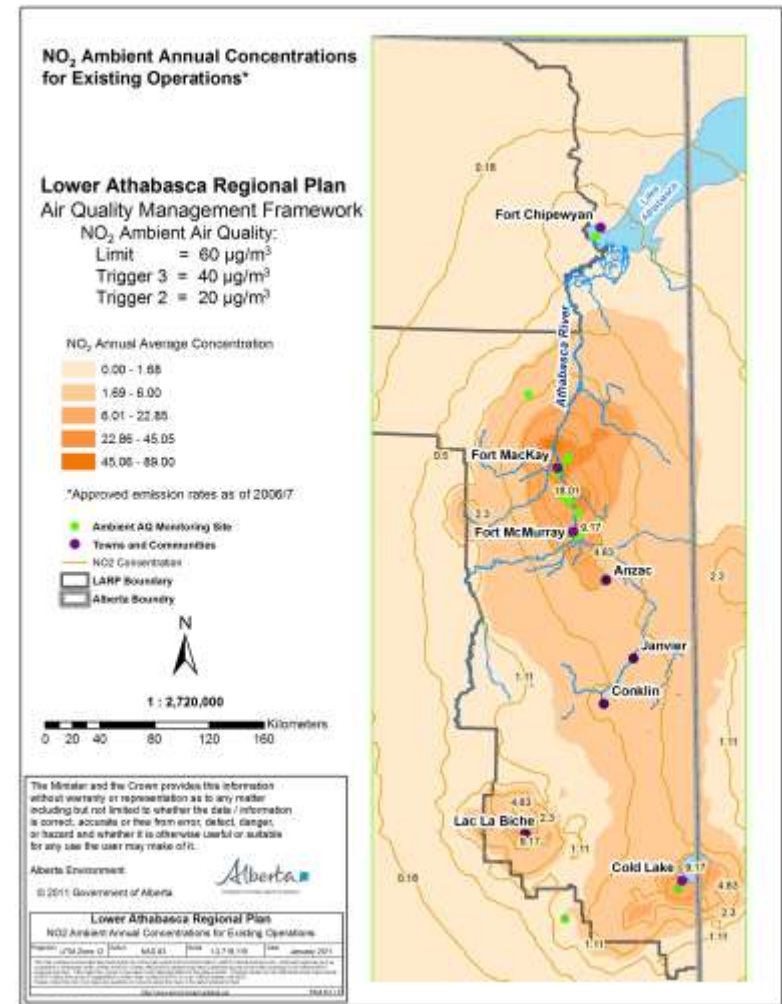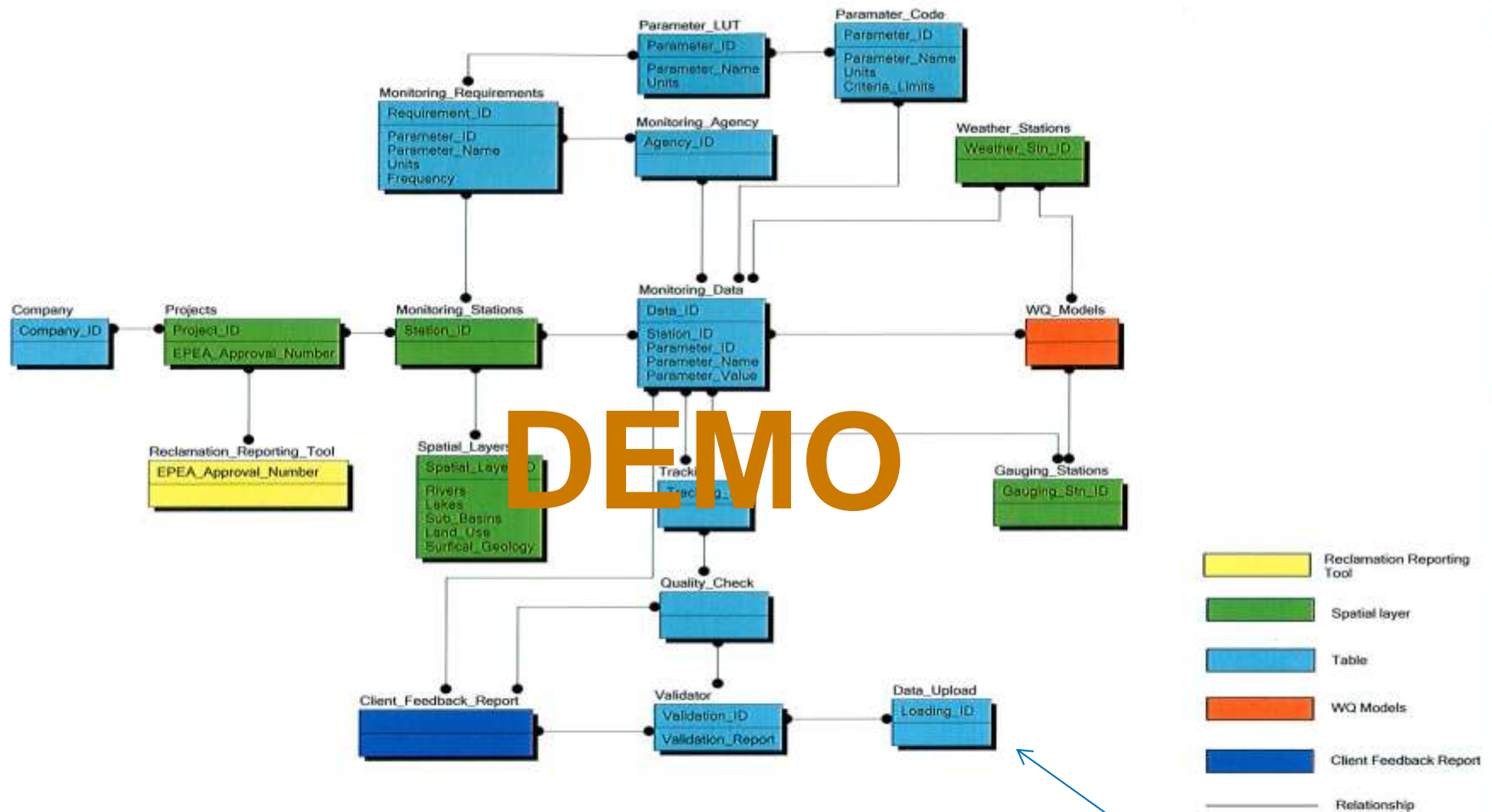
Cumulative Effects Management Tool

- Demo
  - GIS Interface and Visualization
    - o Surface water
    - o Groundwater and
    - o Air quality
  - Data Analytics
    - o Excel
    - o R – Stats
  - Air and groundwater quality visualization
  - Electronic reporting and evaluation

Summary and Next Steps

- Summary
  - CEMTool will
    - Provide consistent standard across all regional plans
    - Facilitate data sharing, storage, and communication
    - Time saving
    - Vastly Improved data evaluation and visualization

- Next Steps
  - Connect to Enterprise Data warehouse
  - Incorporate biodiversity data
  - Build an interface for R-Stats

Acknowledgements

- Science, Research and Innovation Team
  - Roger Ramcharita – Director and Sponsor
  - Preston McEachern – former Section Head
  - Robert Magai
  - Hannah McKenzie
  - Susan Satterthwaite
  - Vignesh Devendran
  - Wendell Noordof
  - Lizzy Chow

Questions and Discussion

Contact:

robert.magai@gov.ab.ca