PGDP Groundwater Modeling Support Activity Update

Junfeng Zhu
Kentucky Geological Survey
University of Kentucky

Background

The 2016 model produced a groundwater flow field with a smaller total discharge than the 2008 flow model produced. The goal of this modeling activity is to evaluate impacts of changes in the flow field on simulating TCE plume migration history.

Objectives

1. Incorporate the 2008 transport model parameters into the 2016 flow model.
2. Simulate TCE plume migration for the period of 1966-2008.
3. Compare simulated TCE plume migration with results from the 2008 transport model (and with published/distributed site interpretations of plume concentration extents).*

Project Timeline

- July 2019---Workplan finalized
- August 2019 – November 2019 --- Model configuration and simulation
- December 2019 – January 2020 --- Prepare and discuss comparison of model results
- February 1, 2020 ---Draft report due
- April 15, 2020 --- Final report due

Interim Model Configuration

- Expand stress periods to cover a period from 1966 to 2008;
- Incorporate 2008 TCE transport model parameters, including density, porosity, TCE distribution coefficient, TCE biodegradation parameter, and dispersivity values
- Incorporate 2008 TCE transport model TCE source terms, including first type TCE boundary for RGA, and secondary type TCE boundary for UCRS;

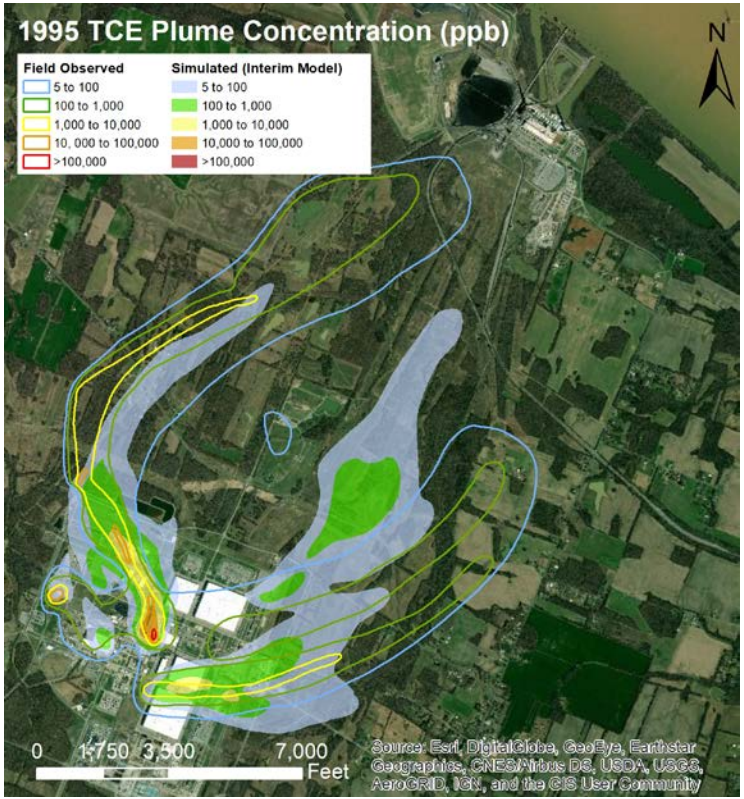
- Further extend the interim model simulation period to 2018, so that the model result can be compared with latest field data.
- Extend the 2008 model simulation period to 2018 for comparison

Preliminary Model Result Comparison

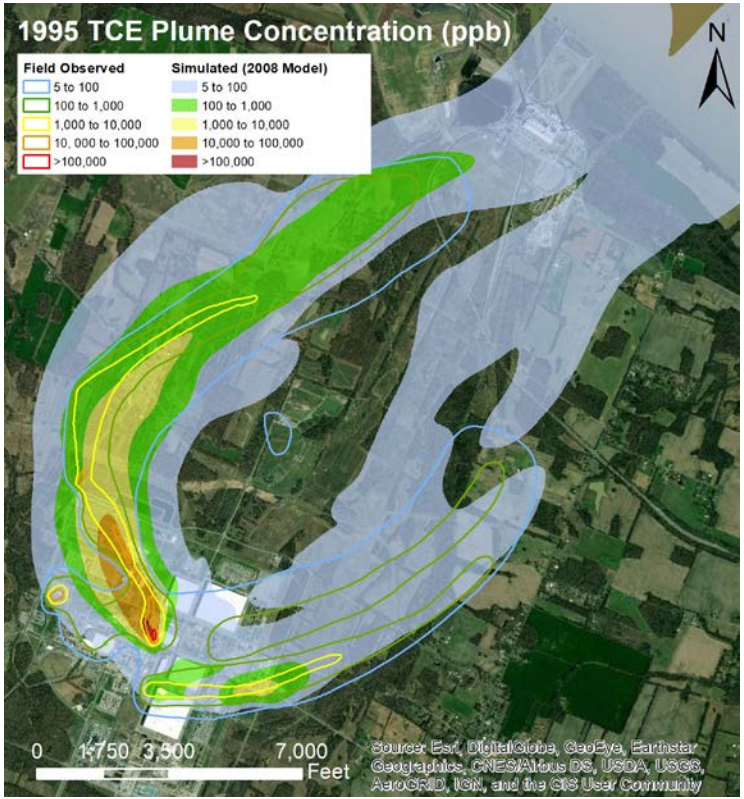
*Simulated results from this activity are illustrated in the following slides as ‘Interim Model’.
*Each ‘Interim Model’ result is illustrated adjacent to it’s corresponding 2008 (Transport) Model result.
*Published/distributed site plume interpretations based upon field monitoring are identified as ‘Field Observed’ on the following Interim Model and 2008 Model figures.

Compare Model Results:1995

Interim Model

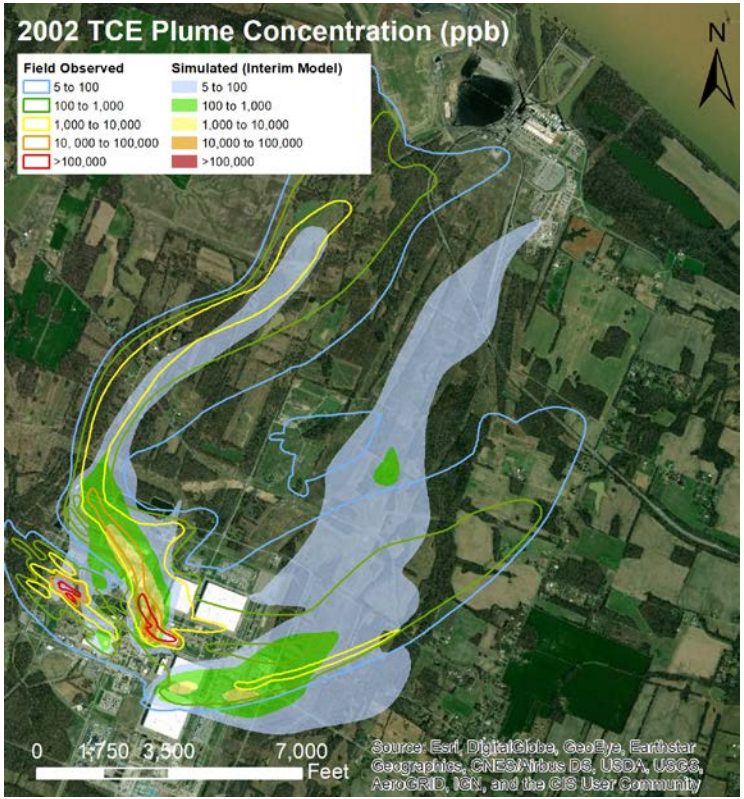


2008 Model

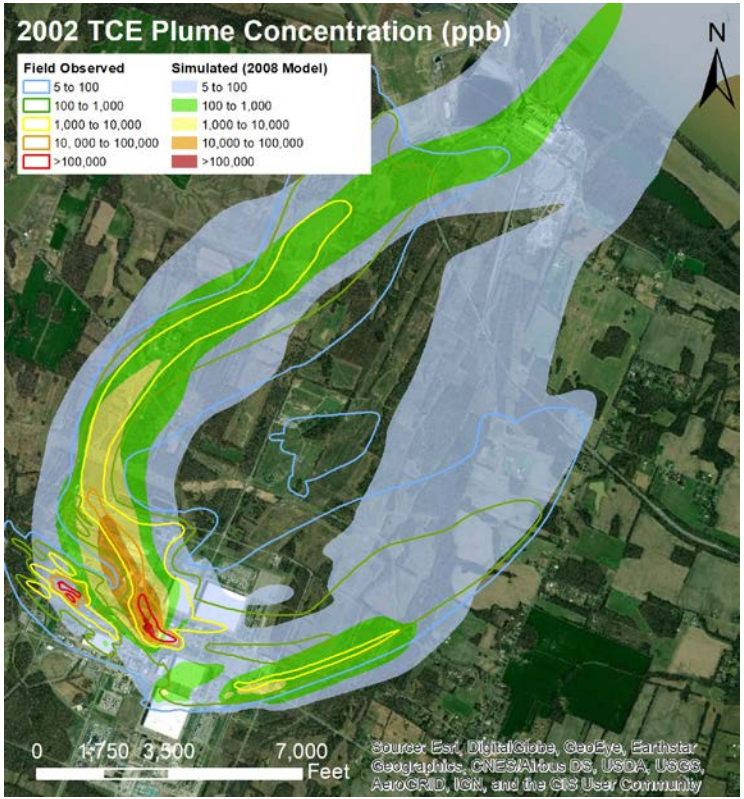


Compare Model Results:2002

Interim Model

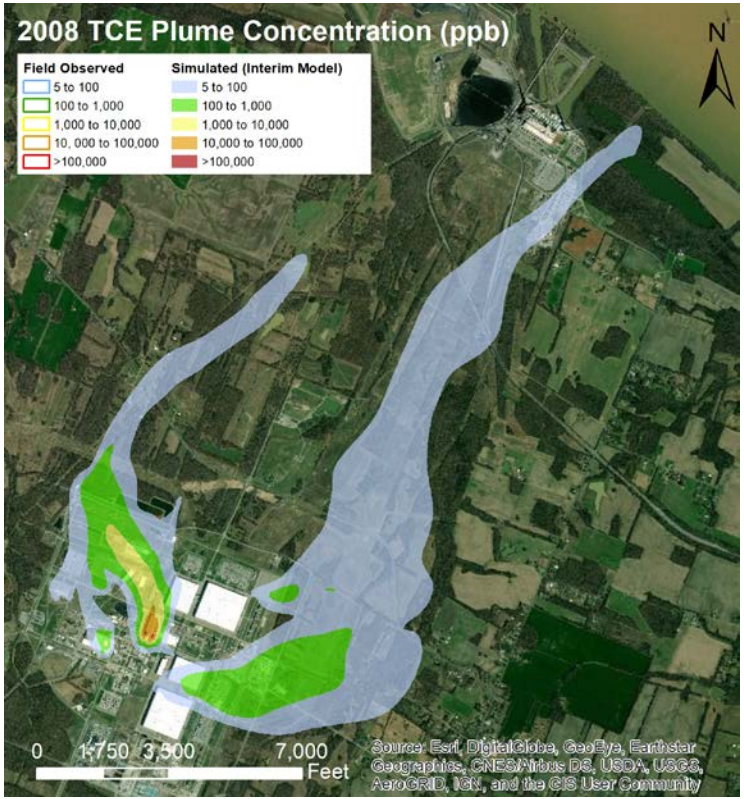


2008 Model

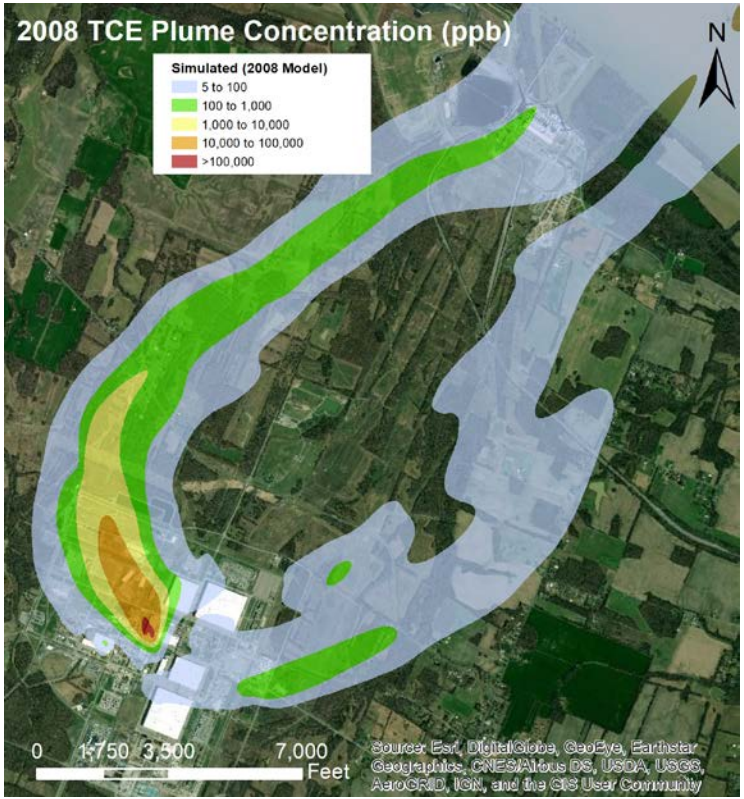


Compare Model Results:2008

Interim Model

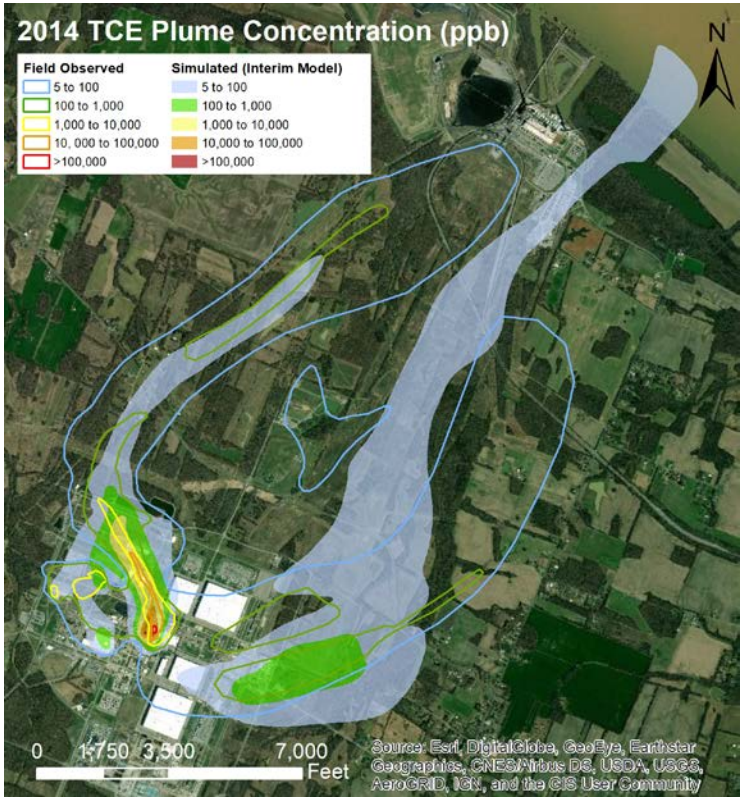


2008 Model

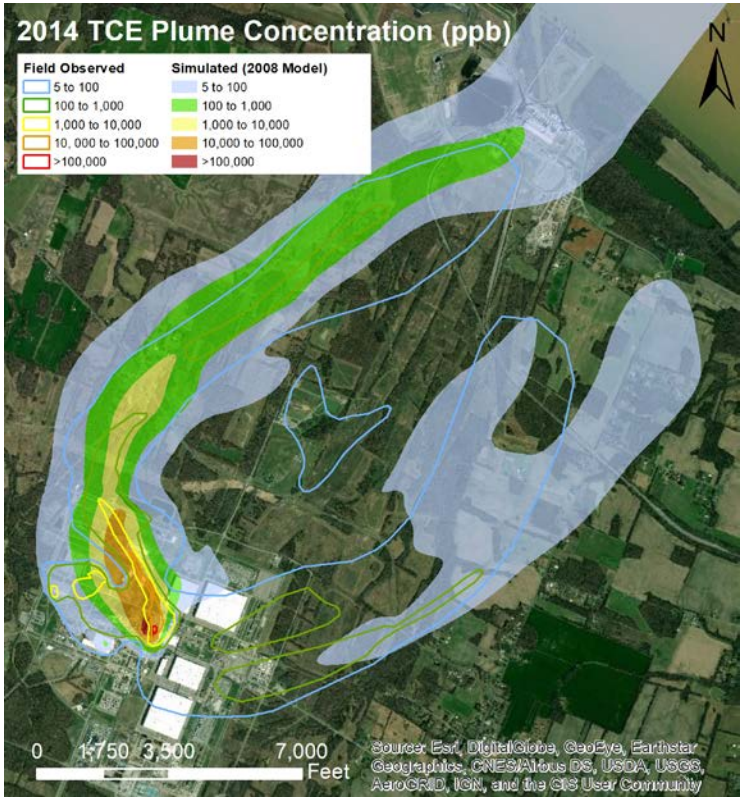


Compare Model Results:2014

Interim Model

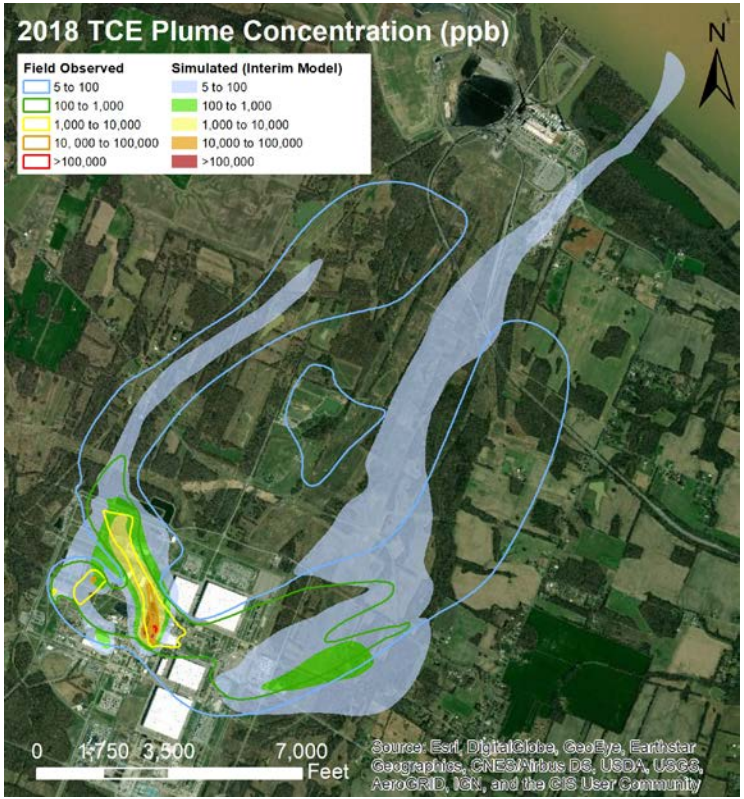


2008 Model



Compare Model Results:2018

Interim Model



2008 Model