Analyzing Groundwater Quality Data and Contamination Plumes: GWSDAT

GWSDAT

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What is GWSDAT?

GWSDAT Summary:

- A user friendly, open source, decision support tool for the analysis and reporting of groundwater monitoring data.
- Smoothing Statistics: data analysis using spatiotemporal penalized spline statistical modelling
- Rapid interpretation of plume behaviour using plume metrics (mass, concentration, area).

Key Benefits:

- Improved data transparency to design and optimize groundwater monitoring.
- Clarity on the relations between dissolved contaminant concentrations, NAPL thicknesses, and groundwater flow.
- Rapid interpretation of complex data sets from large groundwater monitoring networks.
- Facilitated report and (graphics) generation.

How does it work?

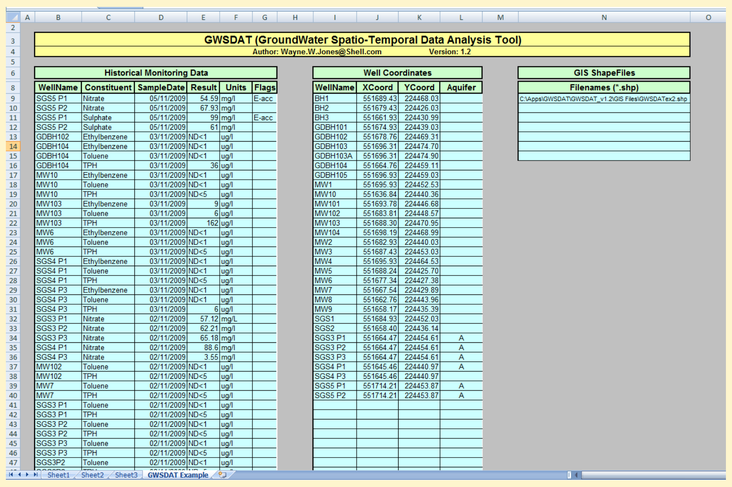
Step 1: Access GWSDAT

Online: R Shiny — University of Glasgow — www.gwsdat.net

Excel Add-in: CL:AIRE 20 LEADING SUSTAINABLE LAND REUSE 1999-2019 — www.claire.co.uk/GWSDAT — energy API — www.api.org/GWSDAT

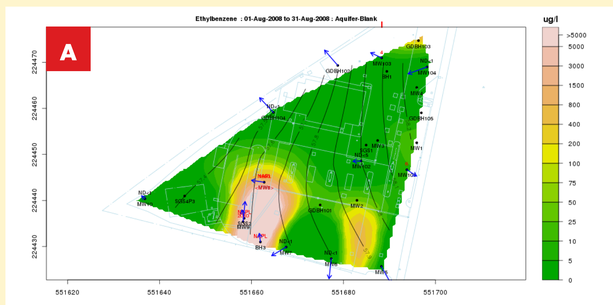
R package: GitHub — R

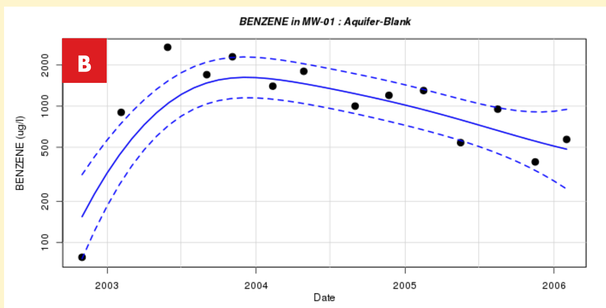
Step 2: Enter your data



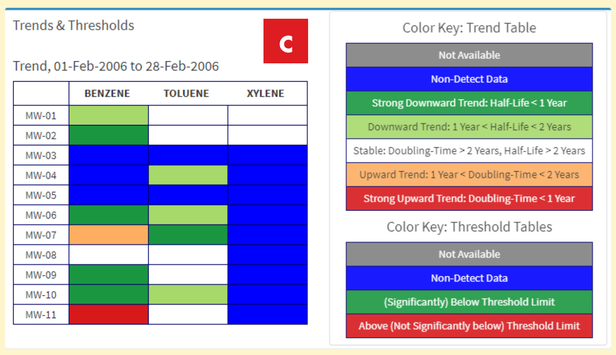
- Enter data via a standard intuitive spreadsheet.
- Add shapefile for basemap.

Step 3: Interactively Analyse your data

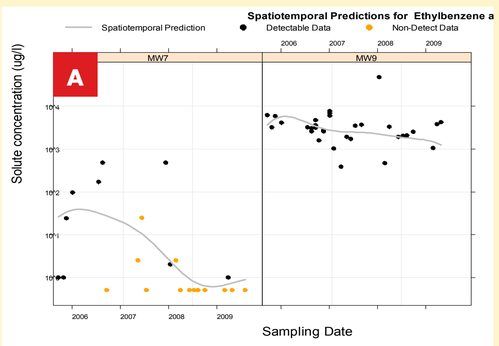




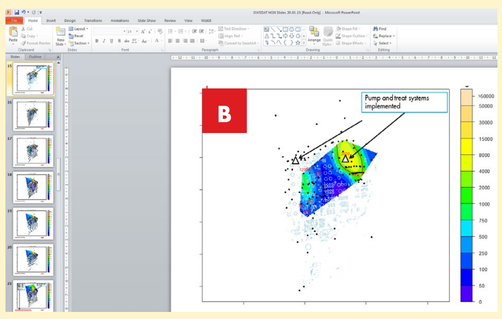
- Concentration contour maps (panel A)
- Individual well Timer series plots (panel B)
- Concentration Trend and threshold indicator matrix. (panel C).

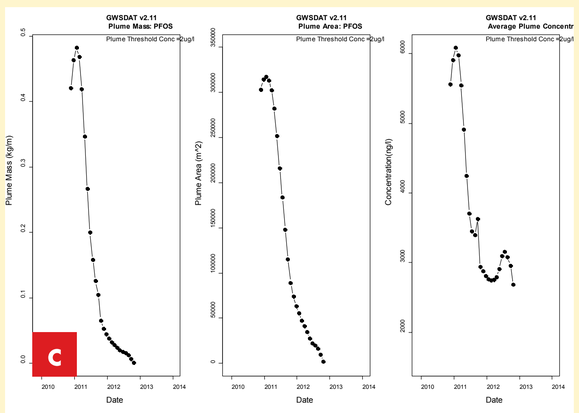


Step 4: Report Generation



- Plots can directly be exported (A)
- Export a sequence of plots of different time slices (B)
- Export plume metrics graphs (C)





More information?

- Jones, W.R.; M. J. Spence; A. W. Bowman, L. Evers, D. A. Molinari (2014) A software tool for the spatiotemporal analysis and reporting of groundwater monitoring data. Environmental Modelling & Software: 55, p242-249 (doi:10.1016/j.envsoft.2014.01.020)
- Jones, W.R.; M. J. Spence; M. Bonte (2015) Analyzing Groundwater Quality Data and Contamination Plumes with GWSDAT. Ground Water: 53:4: p513-514 (doi: 10.1111/gwat.12340)
- Bowman, A. W.; L. Evers, D. A. Molinari, W. R. Jones, M. J. Spence (2015) Efficient and automatic methods for flexible regression on spatiotemporal data, with applications to groundwater monitoring. Environmetrics (DOI: 10.1002/env.2347)

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