

Sharing and modeling groundwater contamination data with the Groundwater Assessment Platform (GAP)

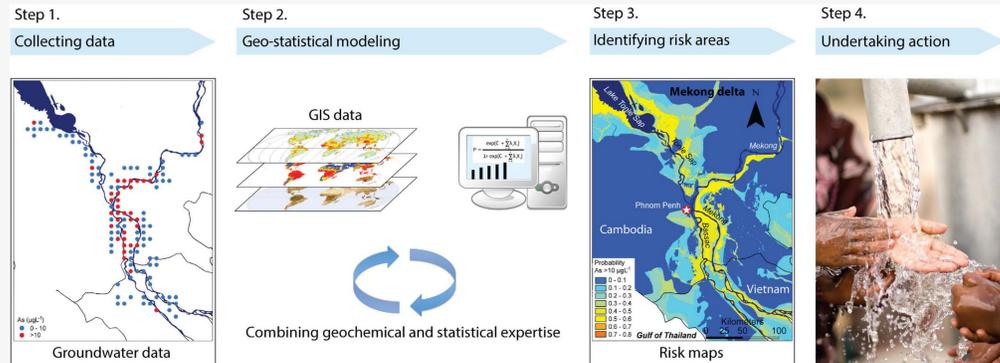
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Introduction: The Groundwater Assessment Platform (www.gapmaps.org) is a free, interactive online GIS platform for the mapping, sharing and statistical modeling of groundwater quality data. Users can upload and control the display parameters of their geospatial data as well as share their data with individual users, community groups or the public. The modeling functionality uses logistic regression and allows users to take advantage of publicly available global datasets of various environmental parameters to produce prediction maps of their contaminant of interest.

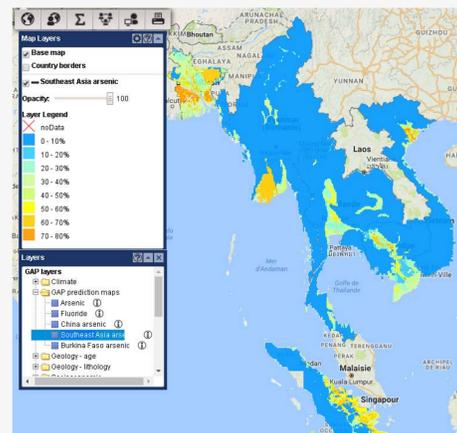
Groundwater contamination maps

GAP contains various global, regional and country-level prediction maps of geogenic groundwater contamination. These have been produced by geostatistical modeling of measured concentration points with spatially continuous environmental predictor variables. The maps indicate areas that are likely highly contaminated and require testing.

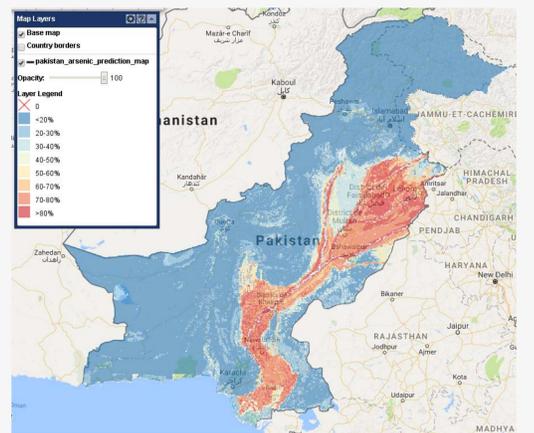
General modeling procedure



SE-Asia arsenic prediction map



Pakistan arsenic prediction map



Areas of application

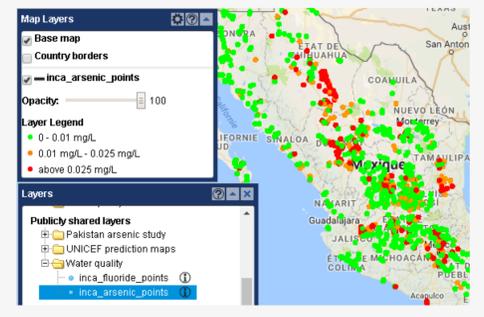
Although originally dedicated to addressing the geogenic groundwater contaminants arsenic and fluoride, GAP was designed in a general manner such that it can be applied to any other geospatial contaminants or measurements of interest. Possible other applications include anthropogenic contaminants (e.g. nitrate, salinity) or soil contaminants.

Share data with a user, community or the public

Communities

Name	Topic	Description
1 GAP workshop WRI	training	an example community in which a fl
2 Annette test	fluoride testing	
3 STAS	Stampriet Transb	

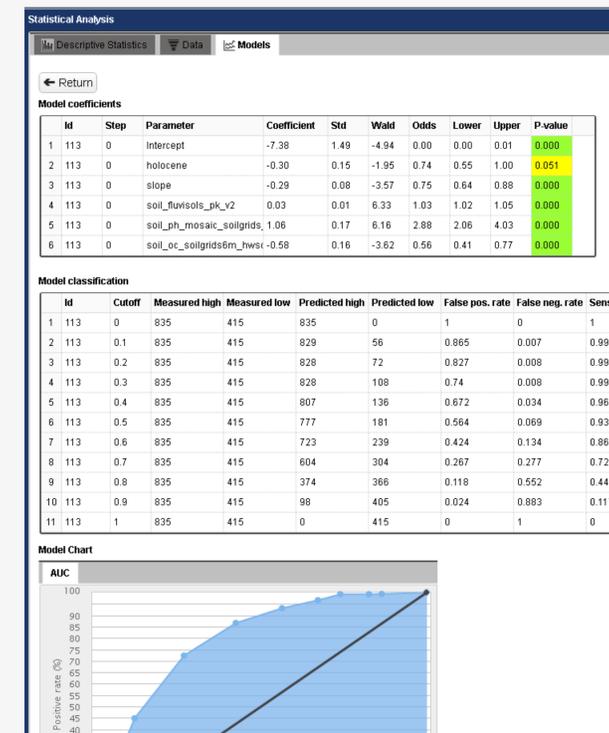
Example of publicly shared data



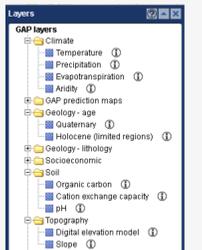
Create contamination hazard prediction maps

Modeling is conducted using logistic regression. Users supply their own point data as the dependent variable. Independent variables may be chosen from the publicly available GAP layers or user-supplied raster or polygon layers. The model may be used to create a map and exported as a GeoTIFF.

Model output includes statistics on independent variables, model classification and an ROC curve

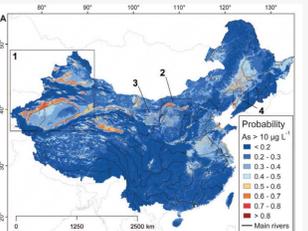


GAP layers



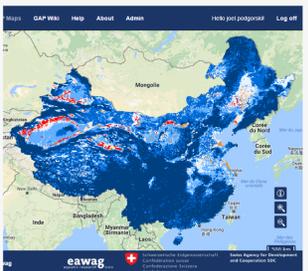
Comparison modeling offline vs. GAP

China arsenic prediction map produced through statistical programming



L. Rodríguez-Lado et al., Groundwater arsenic contamination throughout China. Science 341, 866–868 (2013).

Nearly identical map produced with much less effort in GAP



Upload own data and manage display settings

Upload rasters, shapefiles or point data

Name	Type	Shared	Last Update
57 main_data_points_2014	Point	false	9/2/2016, 4:59:52 PM
58 india_edited_final_data_4	Point	false	9/2/2016, 5:09:35 PM

Set the symbology, e.g. filters, symbols

Symbol	Size	Filter	Label
1	6	wl_mbg1 <= 30 and wl_mb	Water level 0-30 mbgl
2	6	wl_mbg1 > 30 and wl_mbg	Water level 30-80 mbgl
3	6	wl_mbg1 > 80	Water level >80 mbgl

