

GWML2, New Zealand

Alexander Knoch, University of Tartu



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WMO HydroHub



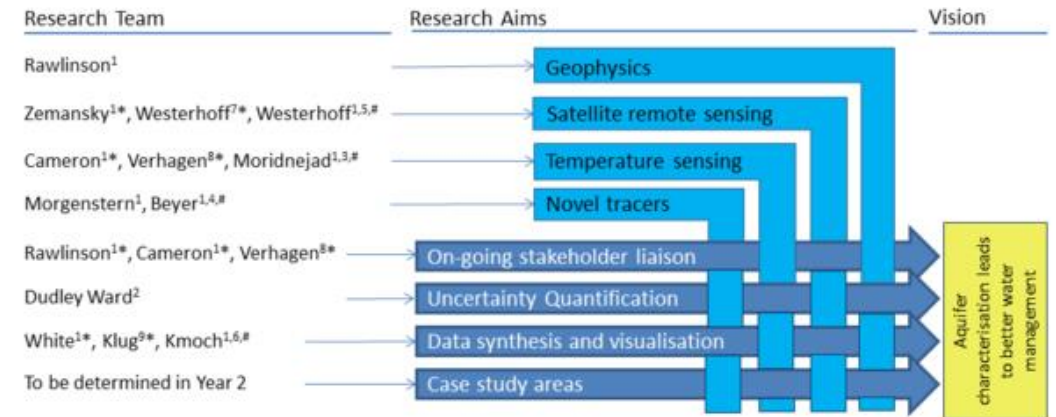
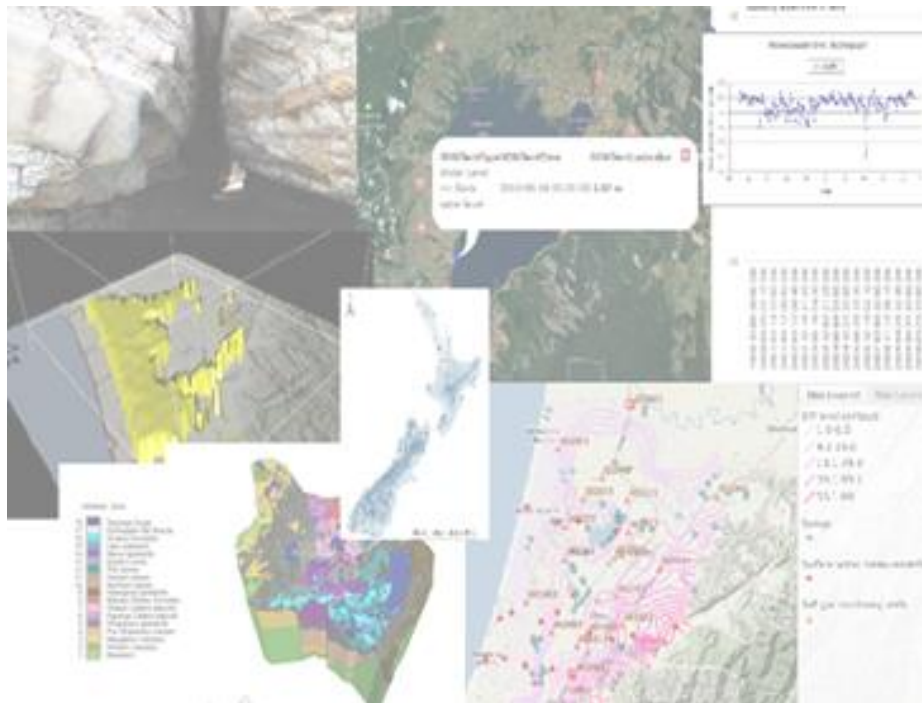
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UNIVERSITY OF TARTU

A CONTEXT-BASED GROUNDWATER DATA INFRASTRUCTURE

ALEXANDER KMOCH



Research Institutes

- | | | | |
|--|---------------------------------------|--|---------------------------------------|
|  | 1 GNS Science |  | 7 Deltares (NL) |
| | 2 Otago Computational Modelling Group | | 8 Royal HaskoningDHV (NL) |
| | 3 University of Auckland | | 9 University of Salzburg (AT) |
| | 4 Victoria University of Wellington | | 10 University of Eastern Finland (FI) |
| | 5 University of Waikato | | |
| | 6 Auckland University of Technology | | |
- * Research Aim co-leaders
PhD Students

<http://hdl.handle.net/10292/10740>

<https://www.gns.cri.nz/Home/Our-Science/Environment-and-Climate/Groundwater/Research-Programmes/National-Groundwater-Monitoring-Programme-NGMP>

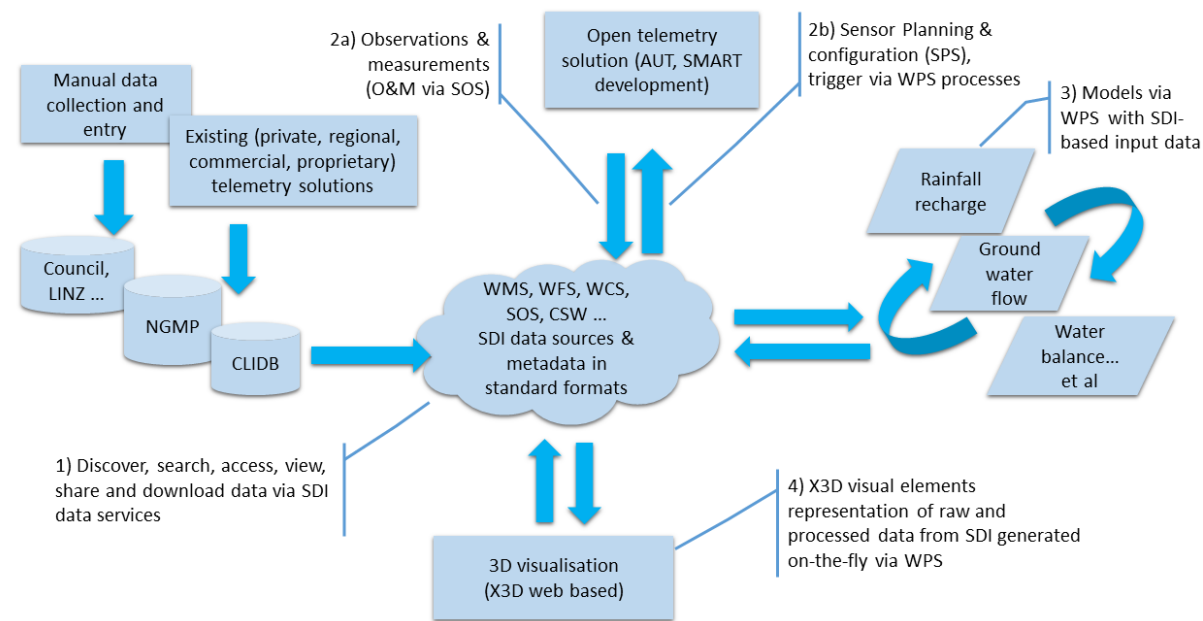
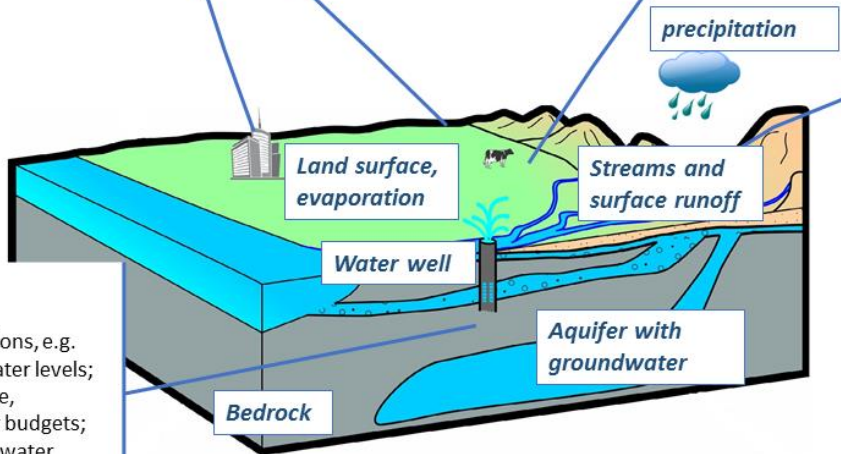
1) Horizons Regional Council:
Collecting hydro-climate and hydrogeological observations and measuring water abstractions; Resources planning and decision making, e.g. water consents and environmental policy

2) Land Information New Zealand (LINZ):
Access to authoritative boundaries and geodetic database, road, address and places data, base maps, elevation and aerial imagery datasets

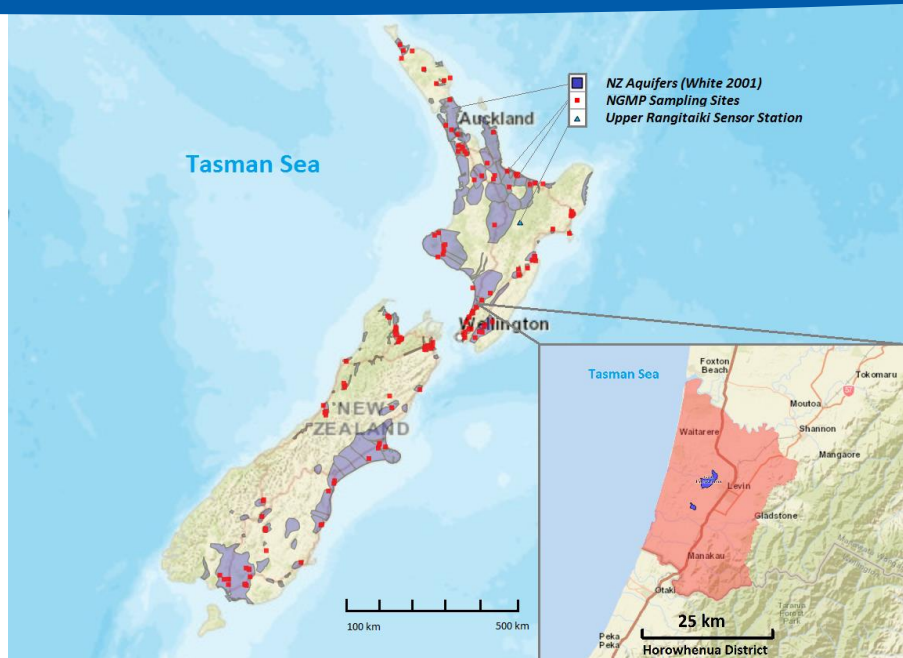
3) Landcare Research:
Mapping land cover and land use, e.g. collecting soil profiles observations into soil map (S-MAP)

4) National Institute for Water and Atmospheric Research (NIWA):
Collecting hydro-climate observations, e.g. precipitation, air temperature, surface water flows; Modelling spatial and temporal distribution of rainfall, evapotranspiration, rainfall runoff, river and stream flows; Managing the Climate and Flow Database (CLIDB)

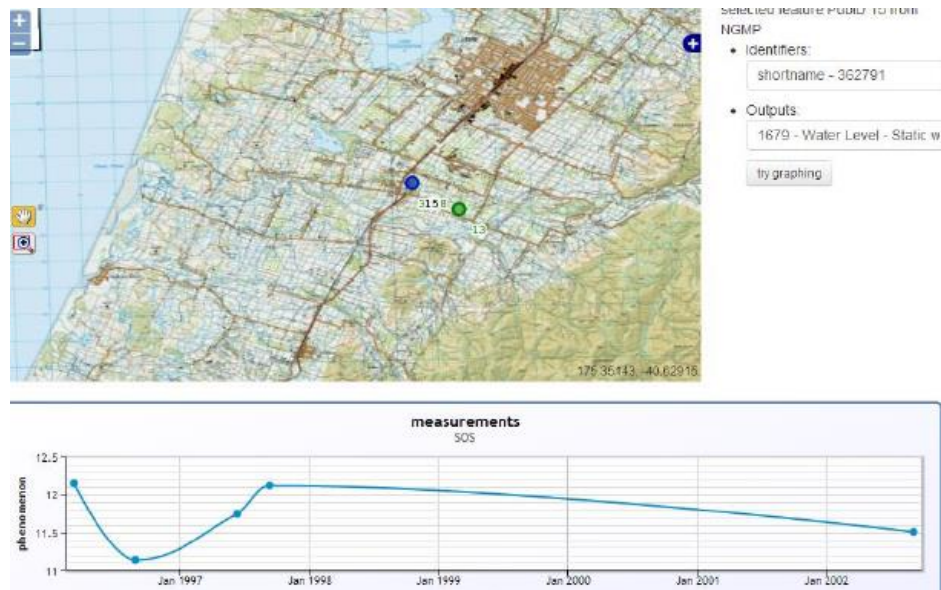
5) GNS Science:
Collecting geological and hydrogeological observations, e.g. well logs, groundwater water levels; Modelling rainfall recharge, groundwater flows, water budgets; manage National Groundwater Monitoring Programme (NGMP) database



1)



3)



2)

The figure shows a screenshot of a web application interface. At the top is a navigation bar with 'Home', a search bar, and icons for Home, Print, and Copy. Below the navigation bar are buttons for 'List all Terms', 'Edit Term', and 'New Term'. The main content area shows a list of terms:

- Preferred label: Water Level - Static water level m
- English term: Water Level - Static water level m
- Description English: [1679]: Water Level - Static water level m (in m)

 At the bottom are 'edit' and 'back' buttons.

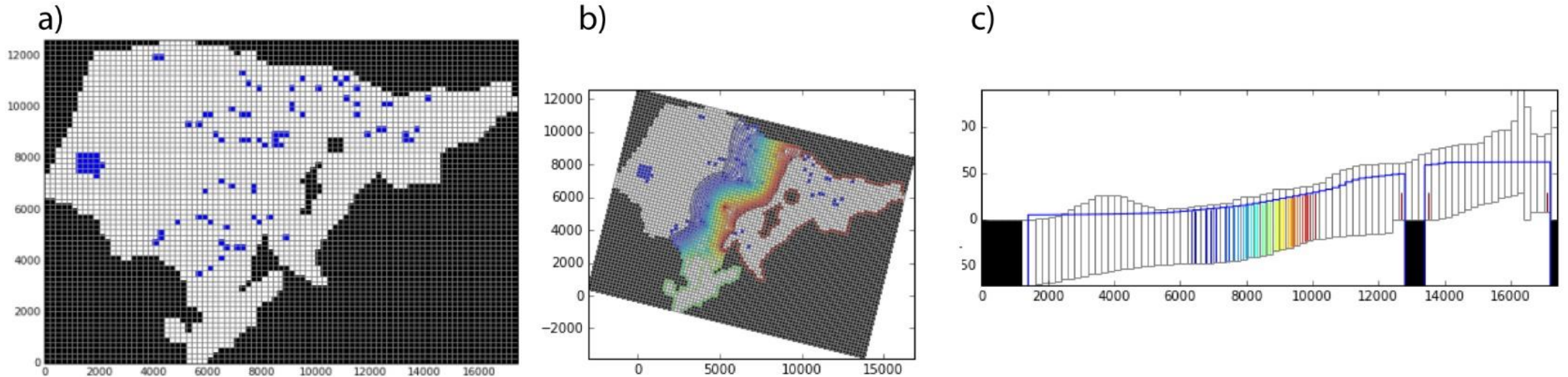
4)

The figure shows a screenshot of a web application interface. On the left is a 'Layers and Legend' panel with a 'Map Legend' and 'Map Layers' section. The legend includes:

- base layers
- Base info
- Hydrology
 - Equilibrium Water Table
 - gaining/losing, sel. rivers
 - Mean rainfall contours
 - Evaporation contours
 - GW level contours
 - Surface water measurements
 - Waikawa Lakes subdivision piezometers
 - Groundwater level measurements
 - SoE gw monitoring wells
- Geology and Landuse

 The main map area shows a map with a legend and a hydrograph. A callout box points to the legend and layers window, stating: "A combined legend and layers window shows the legend as well as active layers for the web map." Another callout box points to the hydrograph, stating: "This featureinfo popup window shows data from the inquired point on the map. A hydrograph for SoE well 363251 and groundwater contours. A particular yearly time slice can be generated on the fly on the web site in the web processing application." A third callout box points to the groundwater level contour plot, stating: "The active layers and their respective legend can be switched in this window. The inquired point on the map also returns the value of the groundwater contour line with 30m (in masl)".

GWML2 and Modflow

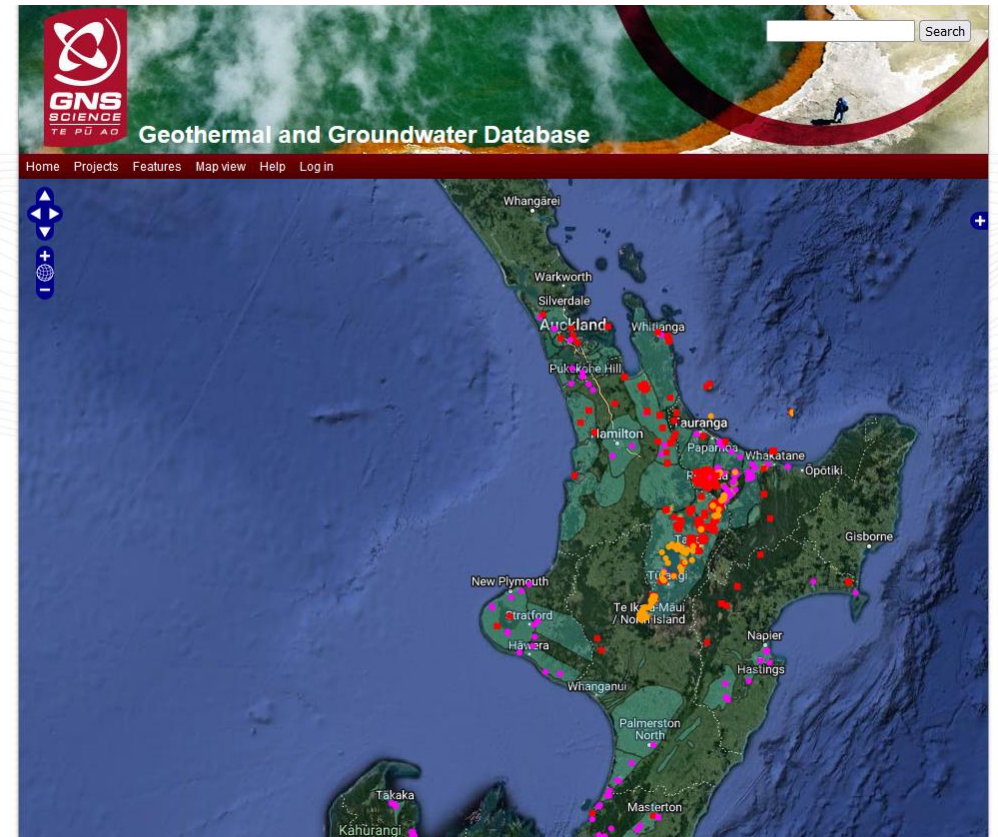


USGS MODFLOW model grid generated from *gwml2:GW_ManagmentArea*; active cells inside the area of interest in white; inactive model cells outside of the area in black; with boundary conditions observation data from *gwml2:GW_Wells* (blue). The management zone is part of the Horowhenua district in the south-western part of the North Island, New Zealand. The depicted area is approx. 12km x 16km

Modflow, Flopy, Python: <https://www.usgs.gov/software/flopy-python-package-creating-running-and-post-processing-modflow-based-models>

Data access at GNS Science, New Zealand

- <https://ggw.gns.cri.nz>
- <https://ggw.gns.cri.nz/ggwdata/map.jsp>



NGMP GGW

A close-up photograph of clear water cascading over dark, wet rocks. The water is in motion, creating white foam and splashes. The background is slightly blurred, showing more rocks and some greenery.

Thank you!



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