OGC WaterML 2.0

Trevor Taylor, Director, Services
Asia and the Americas

UN-GGIM HLF Forum Side Event - SDG 6.6.1
Mexico City,
November 26th, 2017

What is WaterML 2.0?

- Provides a common exchange format for hydrological data
- Builds on existing mature standards (e.g.GML and Observations & Measurements)
- Helps connect In-Situ Data with Satellite Imagery
- Provides the option to fully store information including information regarding quality, validity/interpolation, and remarks

http://www.waterml2.org/

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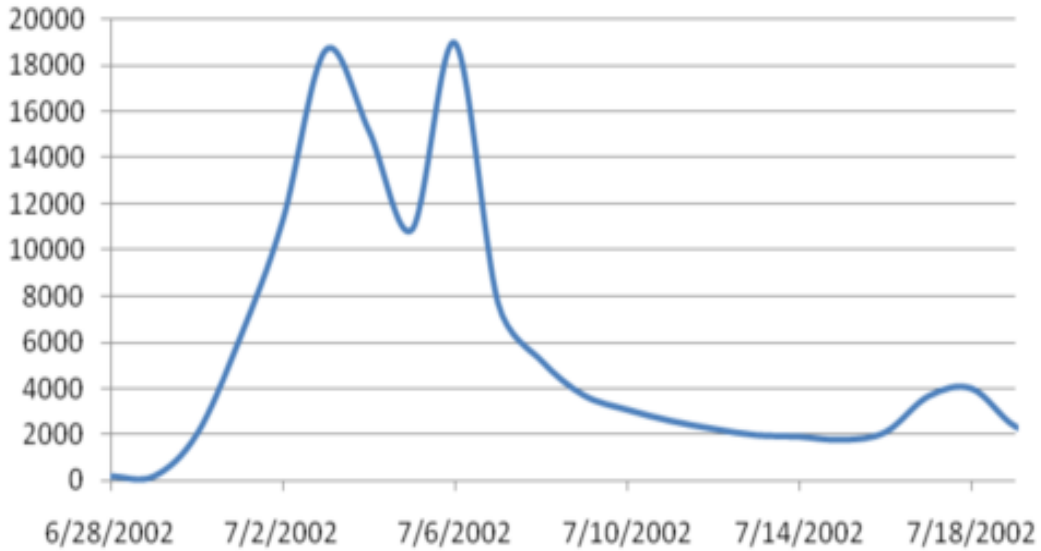
WaterML 2.0: Part 1- Timeseries – 2012

A sampling feature located in space



A series of values in time

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Example Sampling Features

Hydrological term	ISO19156 – Observations & Measurements
Monitoring station, gauging station, site	SF_SamplingPoint
Borehole, observation well, river profile	SF_SamplingCurve
River cross-section	SF_SamplingSurface

Joint OGC and ISO standard

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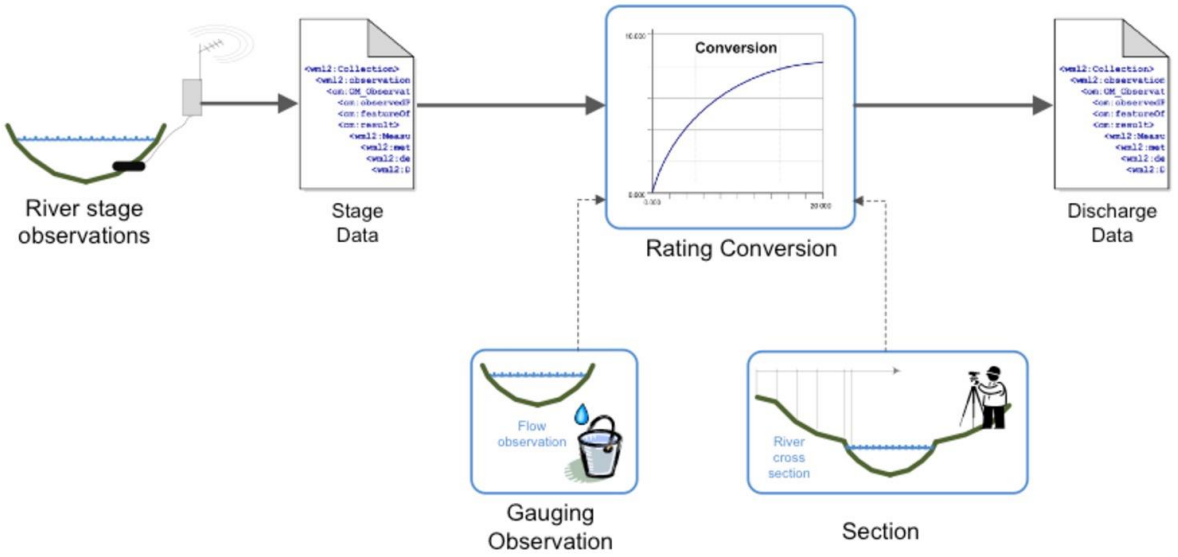
WaterML 2.0 - Part 2 - Ratings, Gaugings and Sections - 2016

- *Conversion tables*, or *conversion curves*, that are used for the conversion of related hydrological phenomenon.
- *Gauging observations*– the observations performed to develop *conversion table* relationships.
- *Cross sections* - survey observations made of the geometric structure of features, such as river channels, storages etc.



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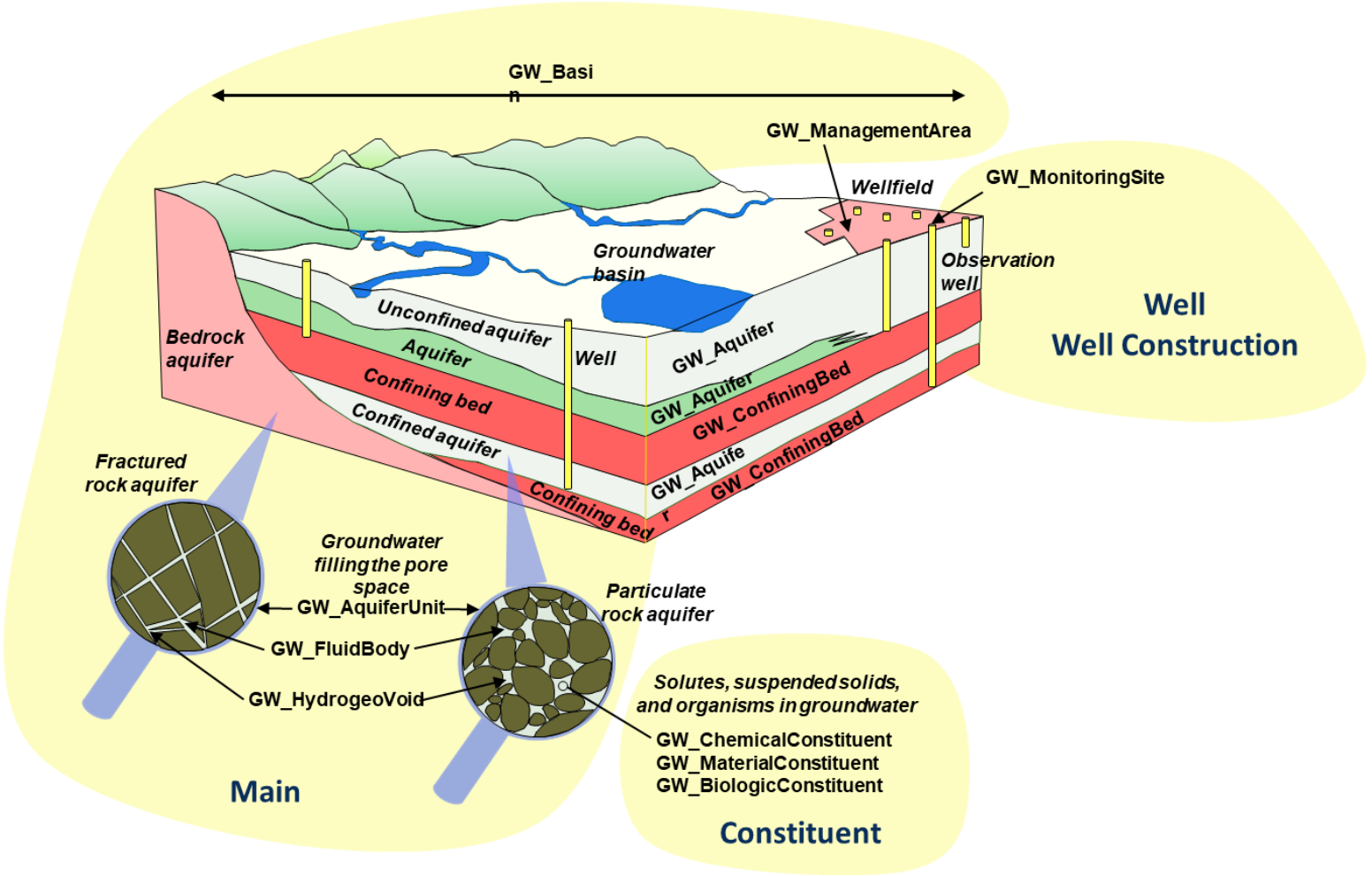
WaterML 2.0 – Part 4 – GroundWaterML 2.0 – 2016 - Scope



Graphic: Boyan Broderic, Natural Resources Canada, present at OGC TC/PC meeting, Dublin, 2016, Hydrology DWG Meeting

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WaterML 2.0 – Part 3: Surface Hydrology Features (HY_Features) – Conceptual Model

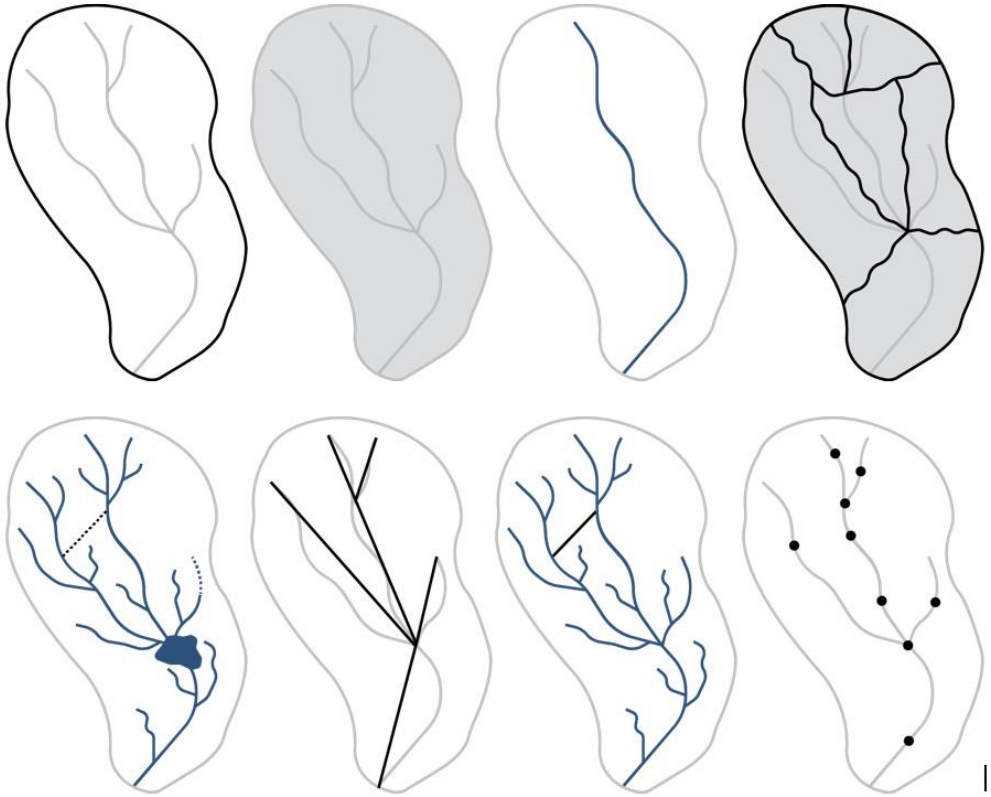

Figure 5: Multiple graphical realizations of a catchment (from top left to bottom right): a) Catchment boundary, b) Catchment area, c) flowpath of catchment d) network of sub catchments, e) cartographic view, f) abstract flow paths, g) hydrographic network, h) network of logically connected monitoring stations.

How can we represent these using a common model ?

In process now

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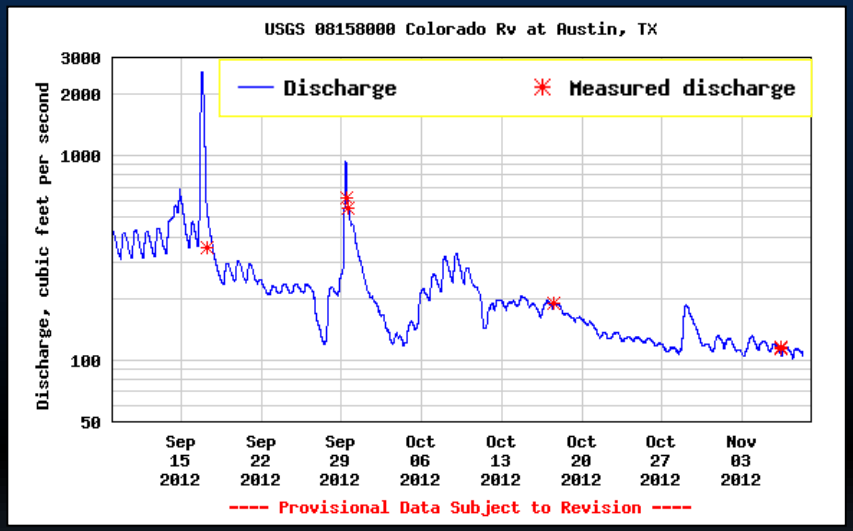
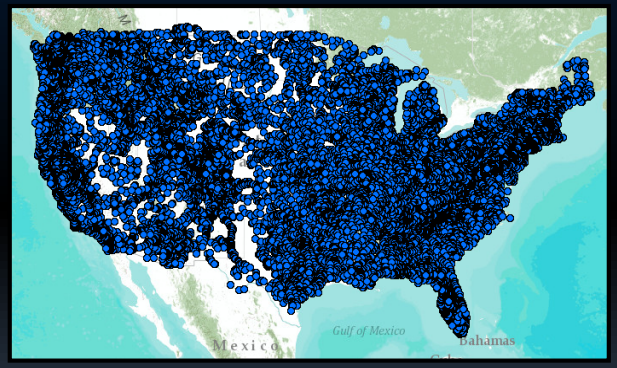
WaterML2 Web Operational Services -USA

Water time series data on the internet



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24/7/365 service
For daily and real-time data

Operational water web services system for the United States

http://waterservices.usgs.gov/nwis/iv/?format=waterml,2.0&sites=08158000&period=P1D&parameterCd=00060

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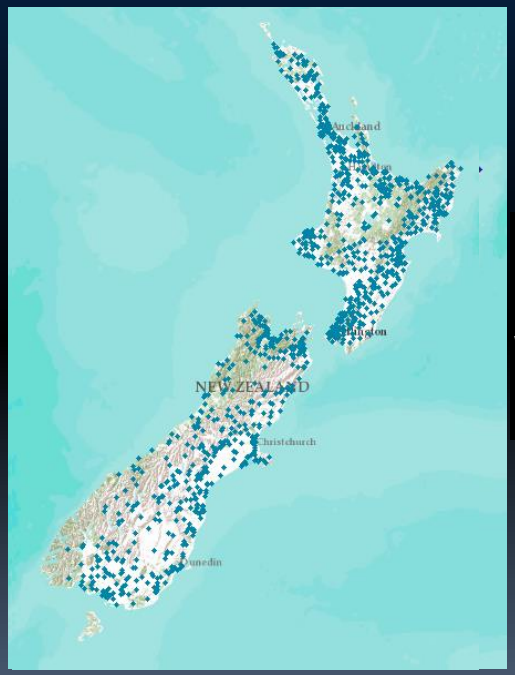
Excerpt from presentation to OGC board of directors by Dr. David R. Maidment, Hussein M. Alharthy Centennial Chair in Civil Engineering „Center for Research in Water Resources, University of Texas at Austin, June 2018

NZ Water Information System

NIWA operates about 20% of 1300 hydrometric stations
Regional authorities operate about 80% of stations

- Auckland Council
- Bay of Plenty Regional Council
- Environment Canterbury
- Environment Southland
- Gisborne District Council
- Greater Wellington Regional Council
- Hawkes Bay Regional Council
- Horizons Regional Council
- Marlborough District Council
- National Institute of Water and Atmospheric Research
- North Shore City Council
- Northland Regional Council
- Otago Regional Council
- Taranaki Regional Council
- Tasman District Council
- Waikato Regional Council
- West Coast Regional Council



New Zealand
Water Information System

Develop a federated hydrological information infrastructure
linking nationally and regionally collected data

Excerpt from presentation to OGC board of directors by Dr. David R. Maidment, Hussein M. Alharthy Centennial Chair in Civil Engineering „Center for Research in Water Resources, University of Texas at Austin, June 2018

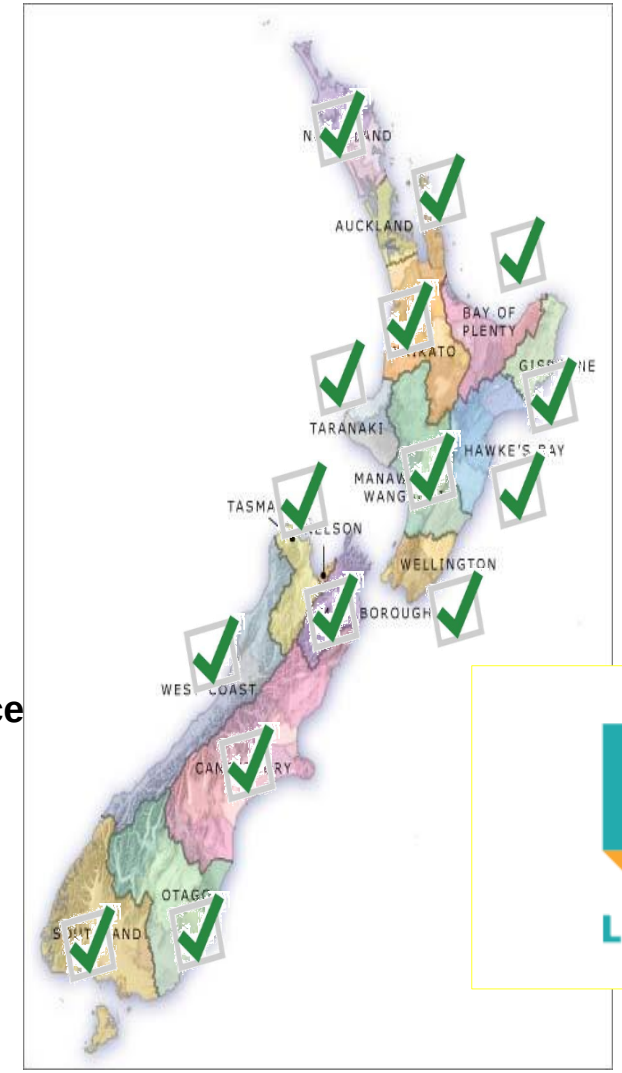
Current State of Play for NZ – all Done!

Local Government

✓ **16**

SOS2/WaterML2 now

SOS = Sensor Observation Service



National - CRIs

✓ **3**

SOS2/WaterML2 now

LAWA
LAND AIR WATER AOTEAROA

Slide: Brent Watson, HRC

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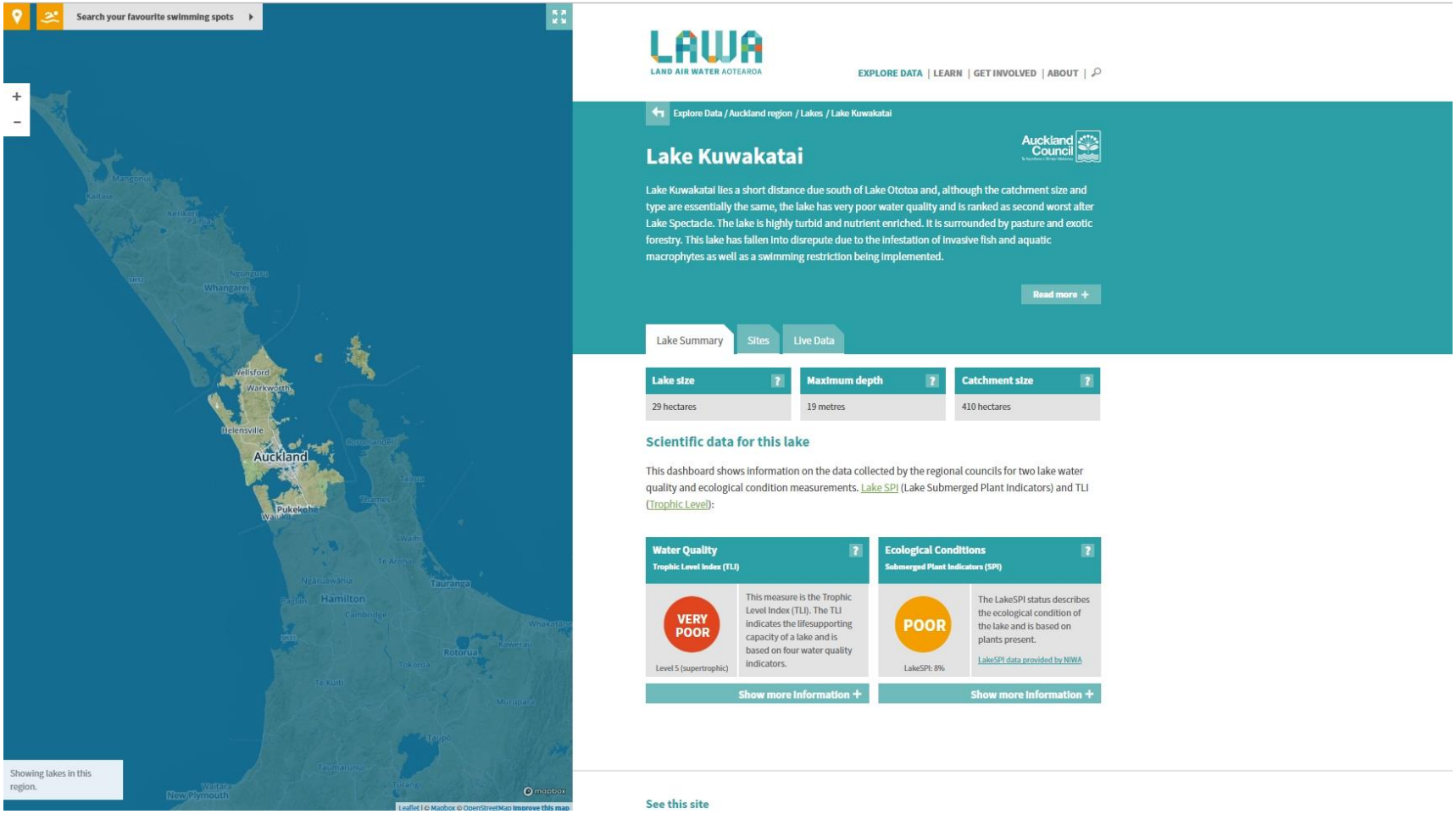
Example – Lake Water Quality



Screen Capture from November 24th, 2017

https://www.lawa.org.nz/explore-data/auckland-region/lakes/lake-kuwakatai/

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Data Sharing using Open Standards in LAWA

- Each region maintains its own data
- Data are accessed through “web services”
- Common language for water: WaterML2
- Open Geospatial Consortium standards
- All information “looks the same” to user

- *A tremendous achievement for New Zealand!!!*

Credit: LAEMG, especially Horizons Regional Council
Michael McCartney, Jeff Watson, Brent Watson, Sean Hodges
NIWA and Landcare

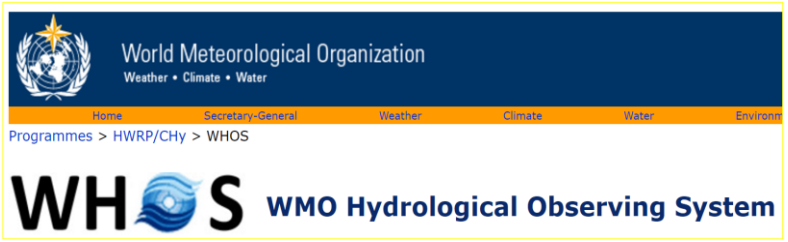
December '17 Technical and Planning Committee Meeting - Palmerston North, New Zealand

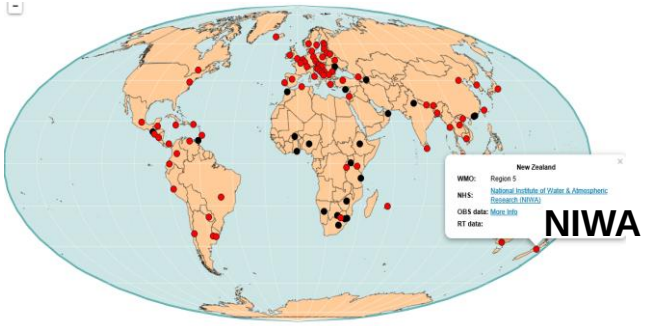
OGC TC/PC - December 3rd, 2017 - December 7th, 2017

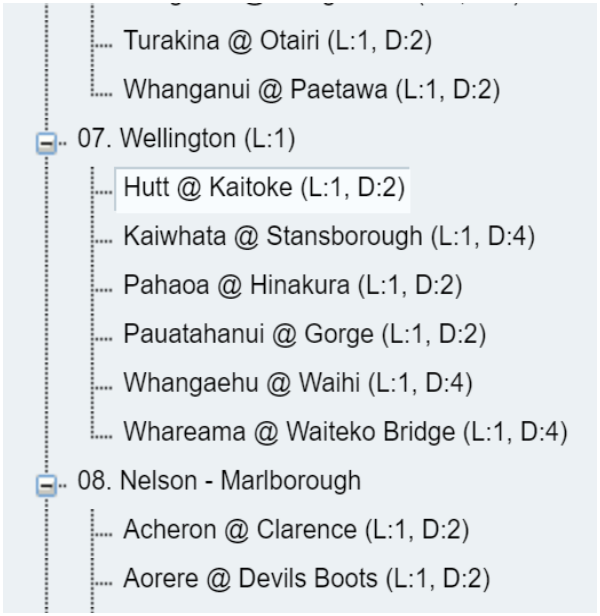
Read More...

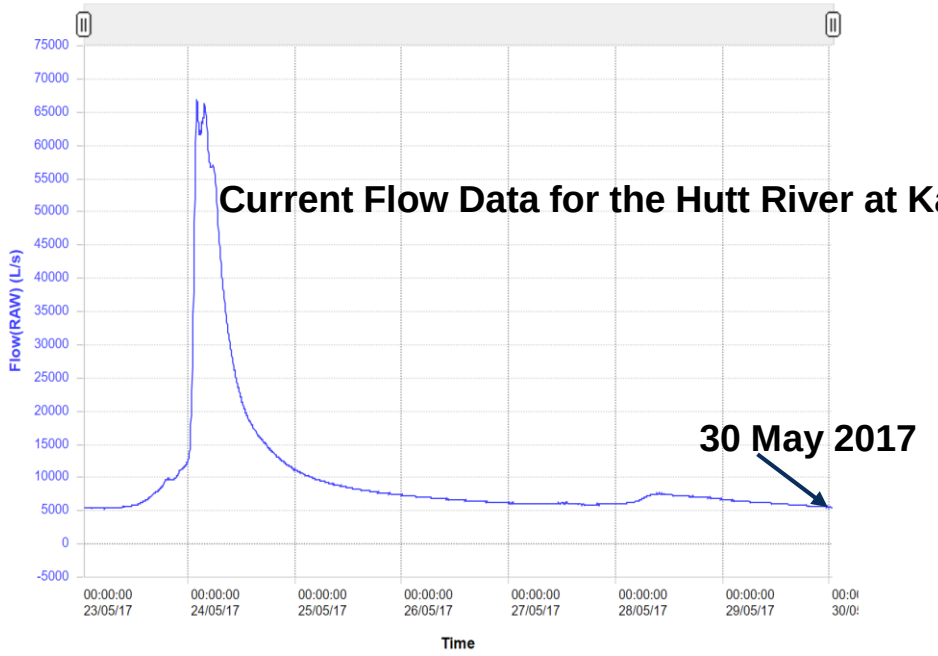
OGC® Making location count.

NZ Data is Available Globally









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http://www.wmo.int/pages/prog/hwrp/chy/whos/

OGC Standards and SDG 6.6.1 (and others)

- Calculating (and publishing) Indicators requires simplified and efficient sharing of data (e.g. real or near real time data for water quality, information derived from satellite images, models)
- Barriers remain due to various factors, such as proprietary formats, lack of accessibility, difficulty finding data, operational policy short-comings, fear of sharing (e.g. liability) and more
- Open Standards enable the sharing of data and information in a vendor and data provider neutral fashion
- Across Domains – related; SoilsML, Environmental Linked Features Experiment, Spatial Data Working Group - W3C/OGC
- OGC Standards are developed via an open, consensus based and transparent process
- Supports operational policy

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Thank You

Open Geospatial Consortium
www.opengeospatial.org

OGC Standards - freely available
www.opengeospatial.org/standards

OGC on YouTube
http://www.youtube.com/user/ogcvideo

OGC TC/PC Meetings – Delft, March 2017

Interested in participating ?
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