Where the Rubber Hits the Road: Rivers in NZ
A Local Government Perspective

Presenters: Sean Hodges & Adrienne Bonnington
Horizons Regional Council

ISO/TC211 Outreach Seminar

Pipitea Campus, VUW
Wednesday 29 November 2017
Introduction

• Regional sector approach
• Pragmatic viewpoint
• Least cost and most standard
• Still hit and miss!
• How to communicate value of this.
• Strong governance
• Methods applied removed influence of fiefdoms
• Standard’s acting effective national tools
• No one standard rules

Art sourced from 
• Conceptual model of how LAWA is brought together
Results/data to LAWA

LAWA data analysis

request

SOS 2.0
response

Time-series data server

SOS2 and WaterML2 are internationally-based Standard languages for asking a question to a time-series data server, and for getting the data back. Eg. Hilltop, Kisters, 52North.
LAWA connects you with New Zealand's environment through sharing scientific data

Search for a site near you

Near me now
Or explore topics

KARYN MADDDREN
STREAMLAND SUPPORT

RIVER OF THE MONTH
The Huparana River - Auckland

ENWSLETTER
Signup for the LAWANewsletter

WATER CLARITY
What is water clarity?

CONSERVING WATER
Tips to help during summer
LAWA and the Deming cycle

Consolidation through continuous improvement and standardization

Quality Improvement
Post-LAWA

- Conceptual model of post-LAWA

Single point of access, irrespective of source

Internal disciplines established
Post-LAWA

- Conceptual model of post-LAWA
- Multiplicity of standards required

Single point of access, irrespective of source

Research  Citizens

LAWA

Govt  Primary Industry
Environmental Integrated Data Infrastructure (e-IDI)
Proof of Concept

Objectives:

• Brokering solution to transform disparate datasets.
• Underpinned with standards
• Use of existing for common terms
• Data discoverability and accessibility
• Data analysis, query and reuse
# Data Sources

<table>
<thead>
<tr>
<th>Source</th>
<th>Datasets</th>
<th>Format</th>
<th>Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Councils (4)</td>
<td>River Monitoring Sites</td>
<td>WFS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>River Measurements flow and stage</td>
<td>XML/WML2</td>
<td>Kisters, Hilltop</td>
</tr>
<tr>
<td></td>
<td>Water Management Zones</td>
<td>WFS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Metadata</td>
<td>XLS</td>
<td>Excel</td>
</tr>
<tr>
<td>Stats NZ</td>
<td>Regions</td>
<td>Shapefile</td>
<td>ESRI</td>
</tr>
<tr>
<td></td>
<td>Meshblocks (census data)</td>
<td>Shapefile</td>
<td>ESRI</td>
</tr>
<tr>
<td>MFE</td>
<td>River Environment Classification</td>
<td>CSV</td>
<td></td>
</tr>
</tbody>
</table>
## Standardising Data

<table>
<thead>
<tr>
<th>Features</th>
<th>OGC supplied format</th>
<th>ISO Standards</th>
<th>Mapped Vocabularies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow &amp; Stage Measurements</td>
<td>SOS WaterML2</td>
<td>19156 Observations &amp; Measurements</td>
<td>SOSA (W3C) QUDT - units of measurement</td>
</tr>
<tr>
<td>Monitoring Sites</td>
<td>WFS</td>
<td>[Localised]</td>
<td>NEMS terms Geosparql (W3C) Geo (W3C) Schema.org QUDT</td>
</tr>
</tbody>
</table>
Mapping Example: Flow

- **DATA Flow**
  - **HRC-00003**
    - Sosa:hasFeatureOfInterest
      - a
        - Rdfs:label
          - **HRC-00003: flow at 2017-08-25T13:30:00+12:00**
        - Sosa:observedProperty
          - nems:water-flow-level
            - **DATA/flow/2017-08-25T13:30:00+12:00/result**
        - Sosa:hasResult
          - **Qudt: numericValue**
            - 7.039
              - **qudt: CubicMeterPerSecond**
              - **Rdf:type**
                - **Qudt: QuantityValue**
Mapping Example: Sites

ID
Measurement-site
HRC-003

a

Envpoc:lawaSiteID

Geosparql: hasGeometry

Geometry

Envpoc:catchment

ID
Catchment
Rangitikei

Envpoc:reach

ID
Reach
7023817

Envpoc: meanAnnualFlow

DATA
Mean-annual-flow
HRC-00003

See REC Data Model

POINT(175.78.. -39.65..)

Geosparql: asWKT

Rdf:type

emar: Catchment

Geosparql: geometry

emar: MeanAnnualFlow

3.932
# Standardising Metadata example

Based on ISO 19115

<table>
<thead>
<tr>
<th>Dataset</th>
<th>Mapped Vocabularies</th>
<th>Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitoring Sites</td>
<td>Dublin Core PublishMyData terms ADMS DCAT DQV Metadata (CSIRO) VOID</td>
<td>XLS</td>
</tr>
<tr>
<td>Flow &amp; Stage Measurements</td>
<td>Dublin Core PublishMyData VOID DCAT</td>
<td>XML/WML2 Manual input into SaaS</td>
</tr>
</tbody>
</table>
Metadata Mapping example

Horizons-monitoring-sites
dct:title Horizons monitoring sites

environment
dct:subject

en
dct:language

Completed
adms:status

Quality-annotation
quality code
dqv:has QualityAnnotation

Title
[ISO Title]

Subject
[ISO TopicCategoryCode]

Language
[ISO Language]

Status
[ISO ProgressCode]

Quality code
[ISO 19157 DataQuality]

nqcs:qc600
dqv:qualityAssessment

oa: motivatedBy

oa: hasBody
Discoverability & Access

This site holds regularly updated river flow data from four New Zealand regional councils: Canterbury, Hawke’s Bay, Horizons and Waikato. The data can be viewed, explored and downloaded through this map-based user interface. The data is organised into a series of datasets and stored as 'Linked Data'. This makes the information available through the Web for use in other software applications. You can also explore it through this website, just explore the links, or take a look at the Getting Started page.

Read about the background to this project and please note of the Disclaimer section: this site is a proof of concept and not suitable for operational use.

**LATEST UPDATES**

<table>
<thead>
<tr>
<th>Dataset</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horizons stage measurements</td>
<td>28/11/2017</td>
</tr>
<tr>
<td>Hawke's Bay flow measurements</td>
<td>28/11/2017</td>
</tr>
<tr>
<td>Hawke's Bay stage measurements</td>
<td>28/11/2017</td>
</tr>
<tr>
<td>Waikato flow measurements</td>
<td>28/11/2017</td>
</tr>
<tr>
<td>Waikato stage measurements</td>
<td>28/11/2017</td>
</tr>
</tbody>
</table>

**EXPLORE BY THEME**

Flow data
Geographical information
Monitoring sites
Stage data

**OR BROWSE ALL OUR DATASETS**

http://envdatapoc.co.nz/
Data Visualisation

https://swirrl.shinyapps.io/NZ_River_Flow/
Visualising Data across 4 Regions

New Zealand River Monitoring (BETA)  ABOUT THIS TOOL  MAP  DATA  CHART  ABOUT THIS PROJECT

Select sites:
- Hautapu at Alabasters
- Esk River at Berry Road 64809
- Awakino River at Ruaroa Farm Bridge

Choose date range:
01 Oct 2017 to 31 Oct 2017

Chart showing river flow trends over time.

Download the data

Map of New Zealand showing data locations.

Data table with details on various sites.
Implementing Standards... Is Hard!
Resources

• Sparql Endpoint:
  • http://envdatapoc.co.nz/sparql

• Project information and links
  • http://www.mfe.govt.nz/node/23788

• Proof of Concept Services (available until 30 March 2018)
  • PublishMyData:
    • http://envdatapoc.co.nz
  • Data Visualisation Application
    • https://swirrl.shinyapps.io/NZ_River_Flow/