Hydrology Domain Working Group
… and some Hydrology Standards in OGC

Scott Simmons, OGC

WEATHER   CLIMATE   WATER

What is OGC?

A hub for thought leadership, innovation, and standards for all things related to location

Our Vision

Building the future of location with community

and technology for the good of society

Our Mission

Make location information Findable, Accessible,

Interoperable, and Reusable (FAIR)

Our Approach

A proven collaborative and agile process combining consensus-based

standards, innovation project, and partnership building

Who Are Our Members?

Commercial

Business Development	Global: Brand Exposure
Competitive Technical Advantage	Funding for Innovation

Government

Innovation & Market Support	International Partnerships
Trusted Advice	Operational Policy
Support & Certification	

Research & Academia

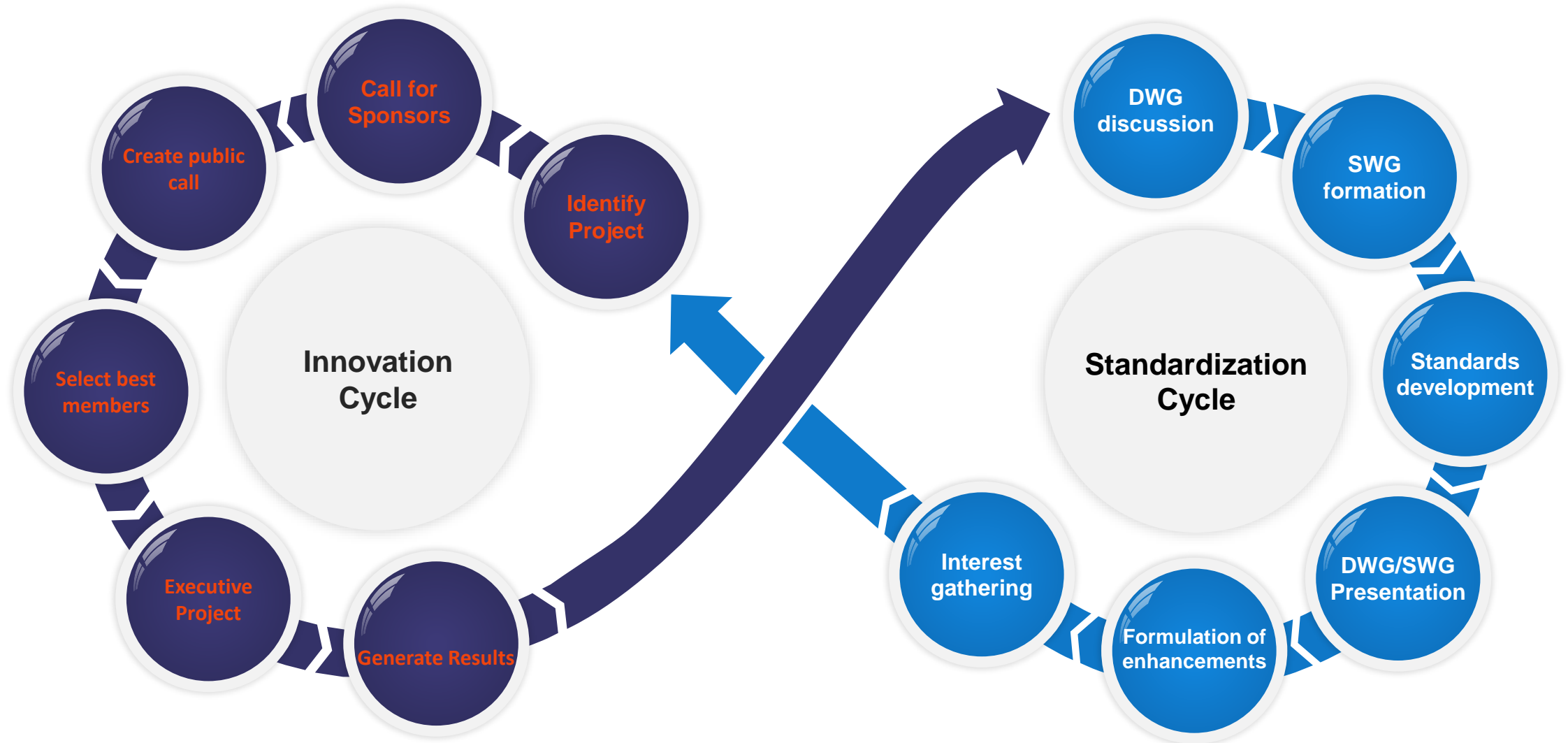|	
Applied Research Partners	International Collaboration
Funding for Innovation	Citations

Some history

OGC Innovation-Standardization continuum

Linked, but focused efforts

- 2003 – Earth Systems Science Domain Working Group (DWG)
- 2009 – Hydrology DWG
- 2011 – Groundwater Interoperability Experiment (IE)
- 2011 – Water Information Services Concept Development Study
- 2011 – Surface Water IE
- 2012 – Hydrology Forecasting IE
- 2013 – Climatology-Hydrology Information Sharing Pilot
- 2013 – Groundwater 2 IE
- 2014 – WaterML 2.0 Standards Working Group (SWG)
- 2015 – Hydrographic Features SWG
- 2016 – Groundwater SWG
- 2017 – Geoscience DWG
- 2018 – Environmental Linked Features IE (ELFIE)
- 2019 – Borehole IE
- 2021 – Second ELFIE (SELFIE)

Groundwater 2 IE Participants

- Geology Survey of Canada, Natural Resources of Canada (GSC)
- US Geological Survey (USGS)
- Commonwealth Scientific and Industrial Research Organization (CSIRO)
- European Commission (DG-JRC)
- University of Ballarat (UB)
- Bureau de la Recherche Géologiques et Minières (BRGM)
- British Geological Survey (BGS)
- Geological Surveys of Germany (GSG)
- Polish Association for Spatial Information (PASI).
- Polish Geological Institute (PGI)
- International Groundwater Resources Assessment Centre (IGRAC)
- Salzburg University (Z_GIS)

2022 March Hydrology DWG meeting agenda

- GWML2 Workshop

- Water Quality Workshop

- HY_Features minimal ontology

- US Progress on River Features and GWML2 Geopackage
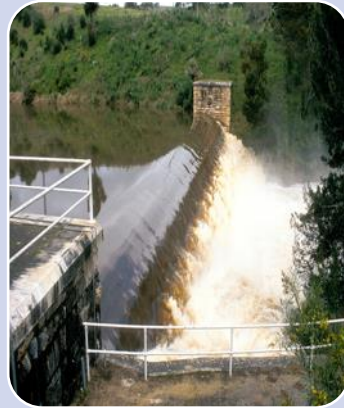
- Open Discussion

Hydrology Standards
thanks to Tony Boston
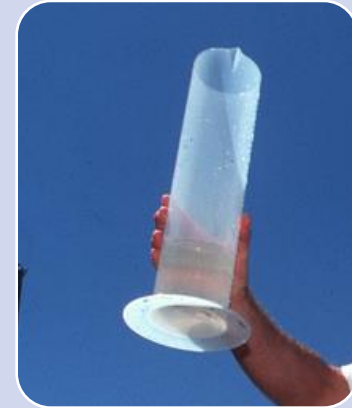
WaterML2.0 standards

Part 1 -
Timeseries

Part 2 – Ratings,
Gaugings and
Sections
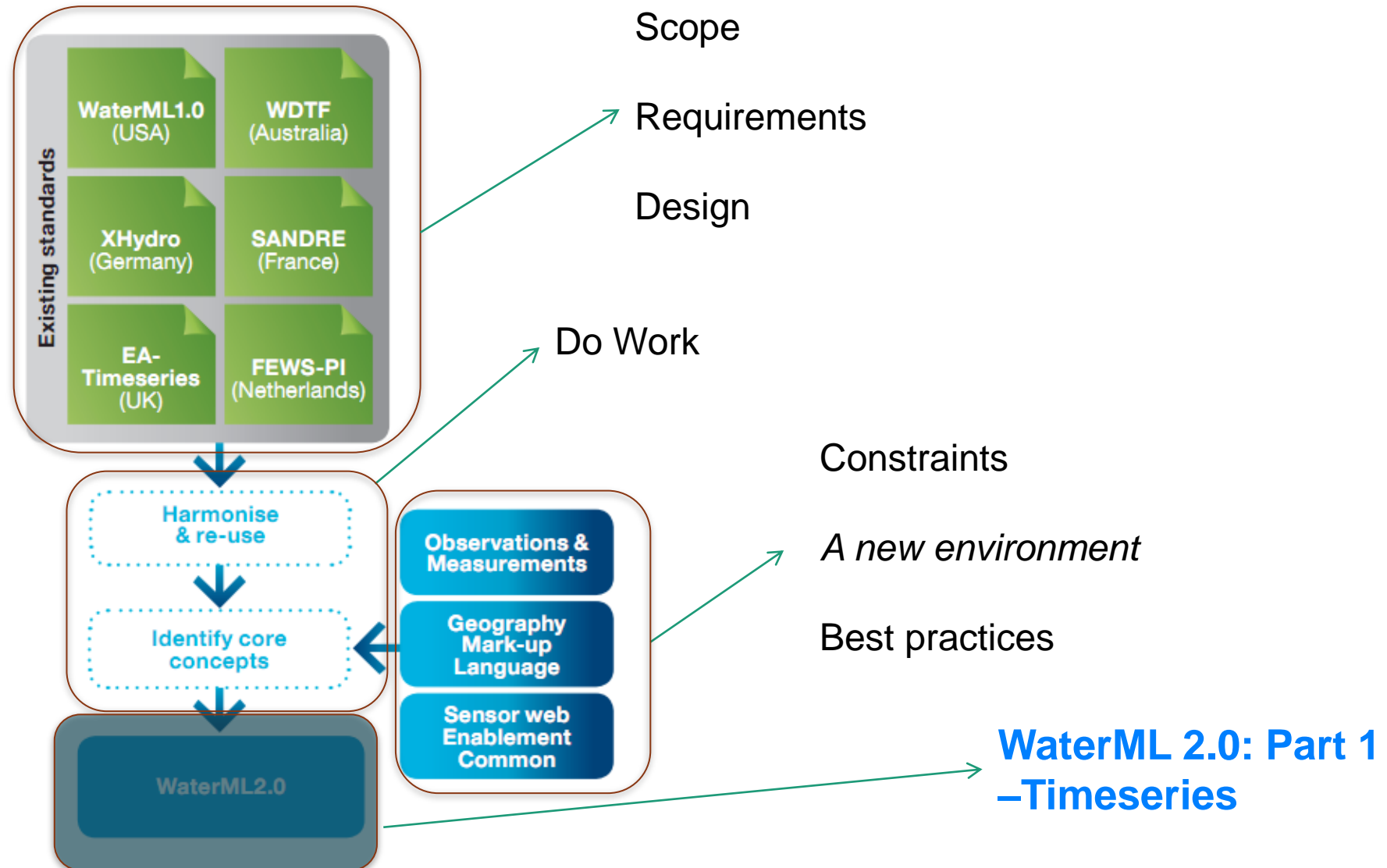
Part 3 –
Surface water
features

Part 4 –
Groundwater

Part 5 –
Water quality
(best practice)

WaterML2: Part 1 – Timeseries Harmonization

Scope

Requirements

Design

Do Work

Constraints

A new environment

Best practices

WaterML 2.0: Part 1 –Timeseries

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WaterML2: Part 1 – Timeseries

◎ Encodes timeseries observations

◎ Profile of O&M, reusing ISO and OGC standards

◎ UML model

◎ XML Schema (GML compliant)

◎ Specification document
  ○ Requirements
  ○ Conformance classes
  ○ Conformance tests

◎ XML Schematron rules

◎ Vocabulary definitions
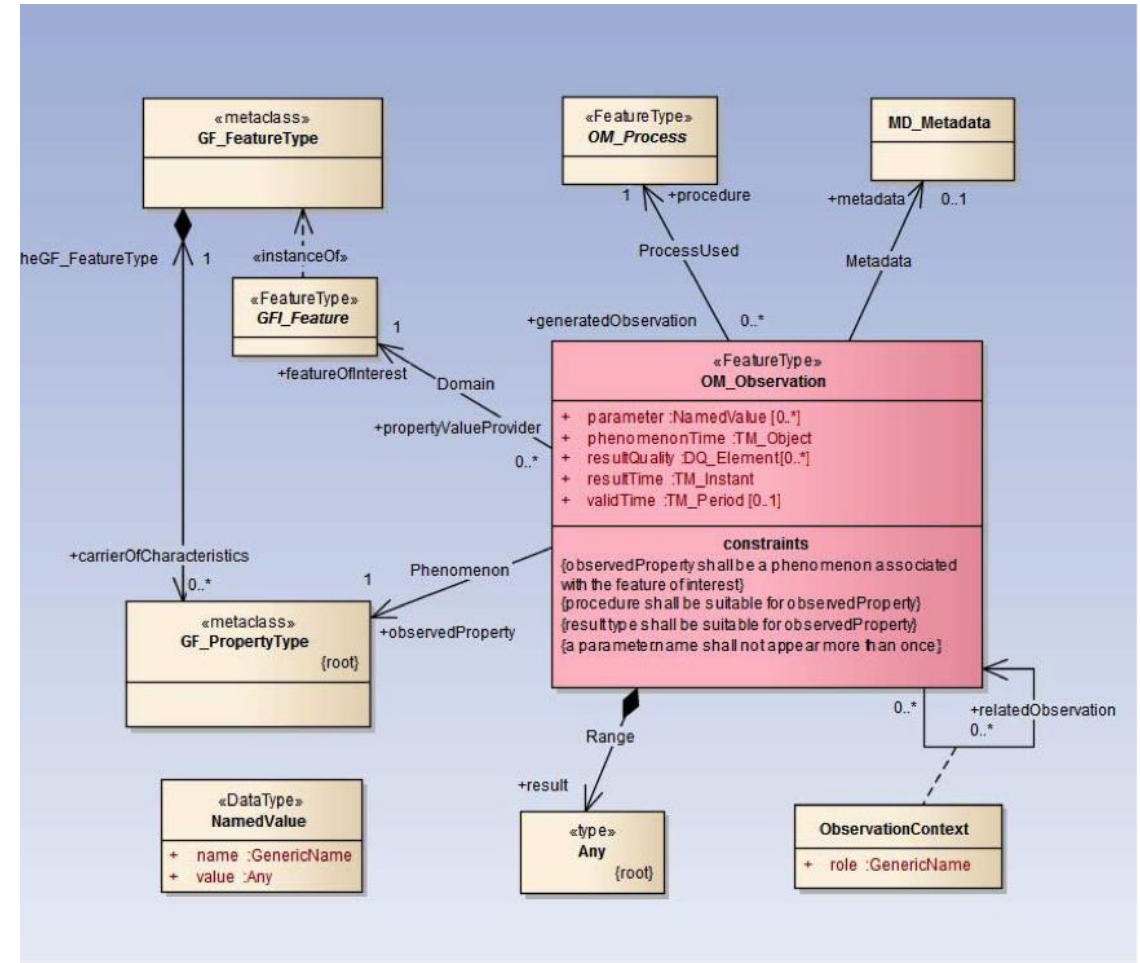
Adoption of WaterML2: Part1

- WaterML2 announcement regarding US national strategy for civil earth observations (2013):
  - http://www.opengeospatial.org/pressroom/pressreleases/1831
- US Federal Geographic Data Committee (FGDC) endorses WaterML2 (2014):
  - http://www.fgdc.gov/standards/news/WaterML
- WaterML2 recommended in EU legislation on data sharing (2013):
  - http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:331:0001:0267:EN:PDF
- USGS implements WaterML2 in Water Information System (2014):
  - http://help.waterdata.usgs.gov/news/april-10-2014
- BoM supports WaterML2 via Water Data Online (2017):
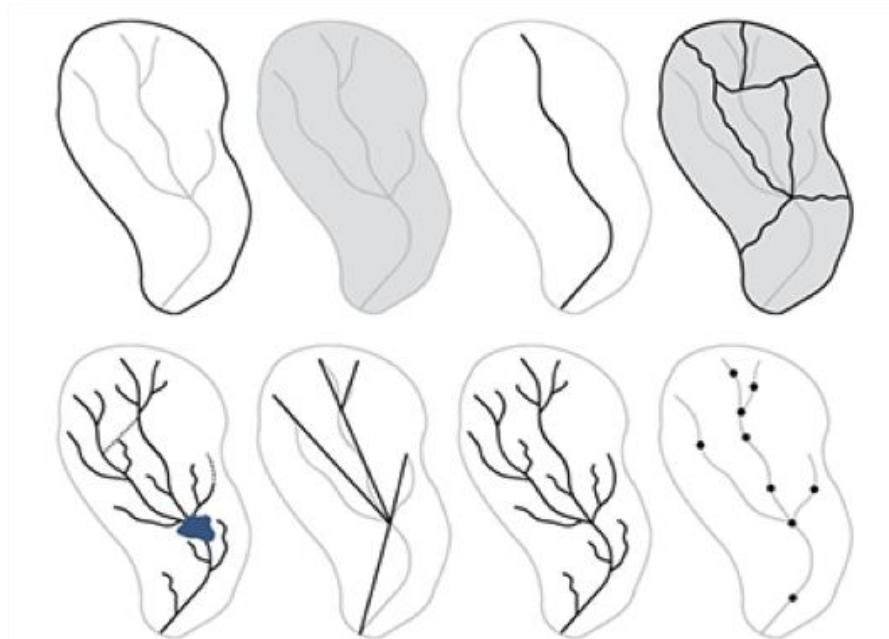 - http://www.bom.gov.au/waterdata/

WaterML2: Part 2 – Ratings, Gaugings and Sections

◎ Encodes rating conversions (e.g., stage to discharge), gauging observations, and river cross sections
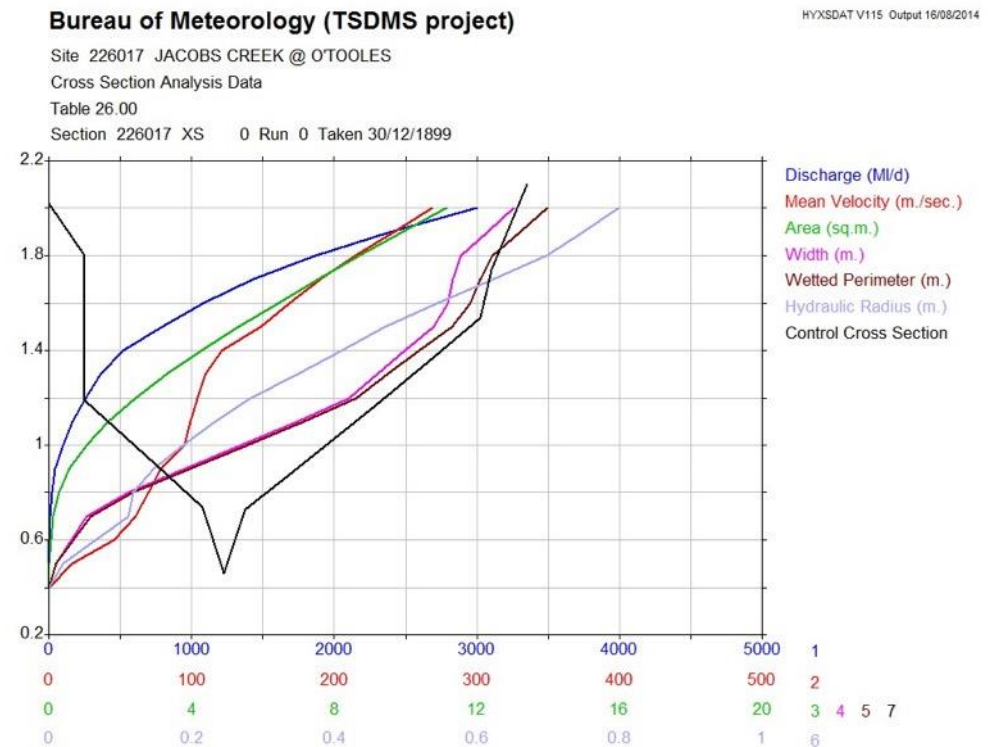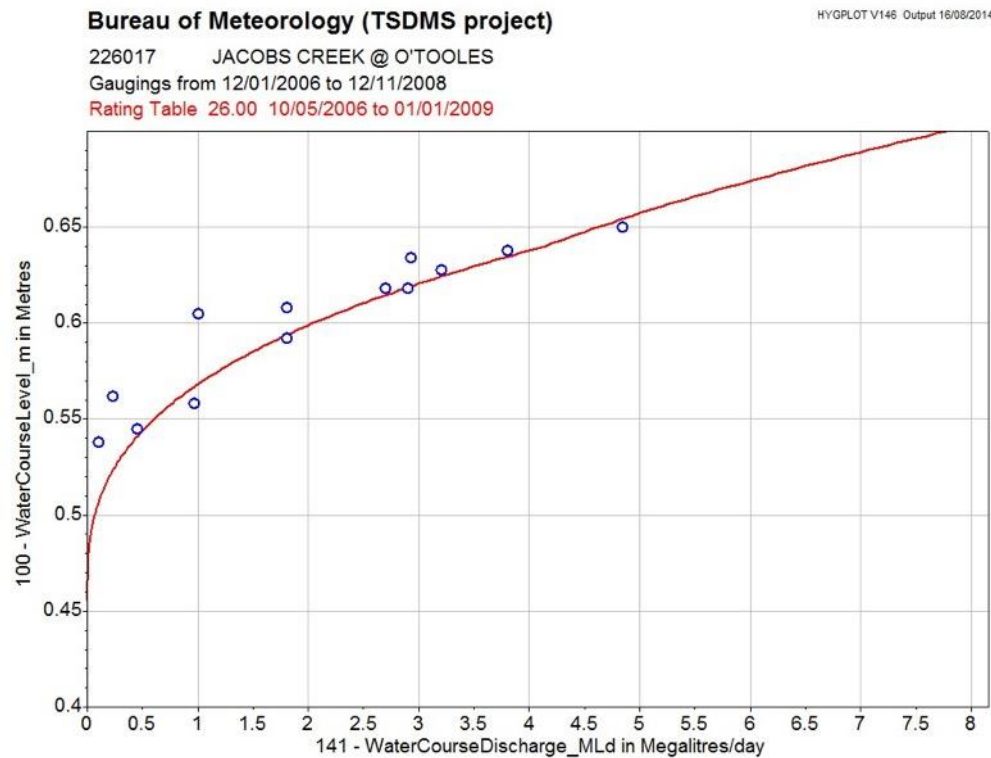
# WaterML2: Part 3 – Surface Hydrology Features (aka HY_Features)

◎ Conceptual model describing surface water hydrologic features such as rivers, lakes, catchments and drainage networks

- Catchment Boundary
- Catchment Area
- Flowpath
- Contained Catchments

- Cartographic Realization
- Topological Schematic
- Hydrographic Network
- Hydrometric Network

WaterML2: Part 4 – GroundWater Markup Language 2 (GWML2)

◎ Subsurface water features and observations

- ○ Hydrogeological units, Aquifers, Voids, Fluid bodies, Hydraulic conductivity, Water wells, Springs

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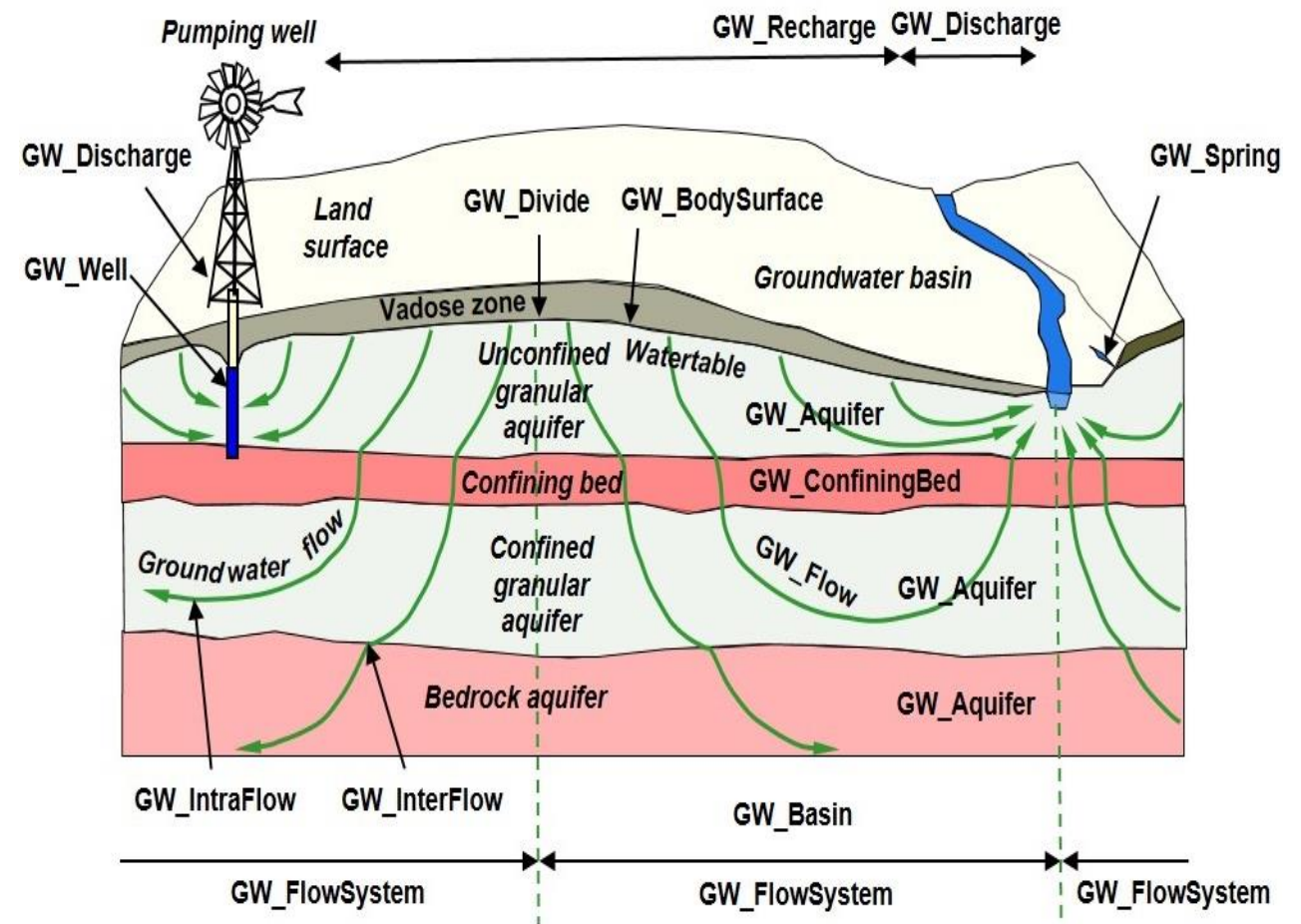
Part 5 – Water Quality… it's up to all of us

Thank you!

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