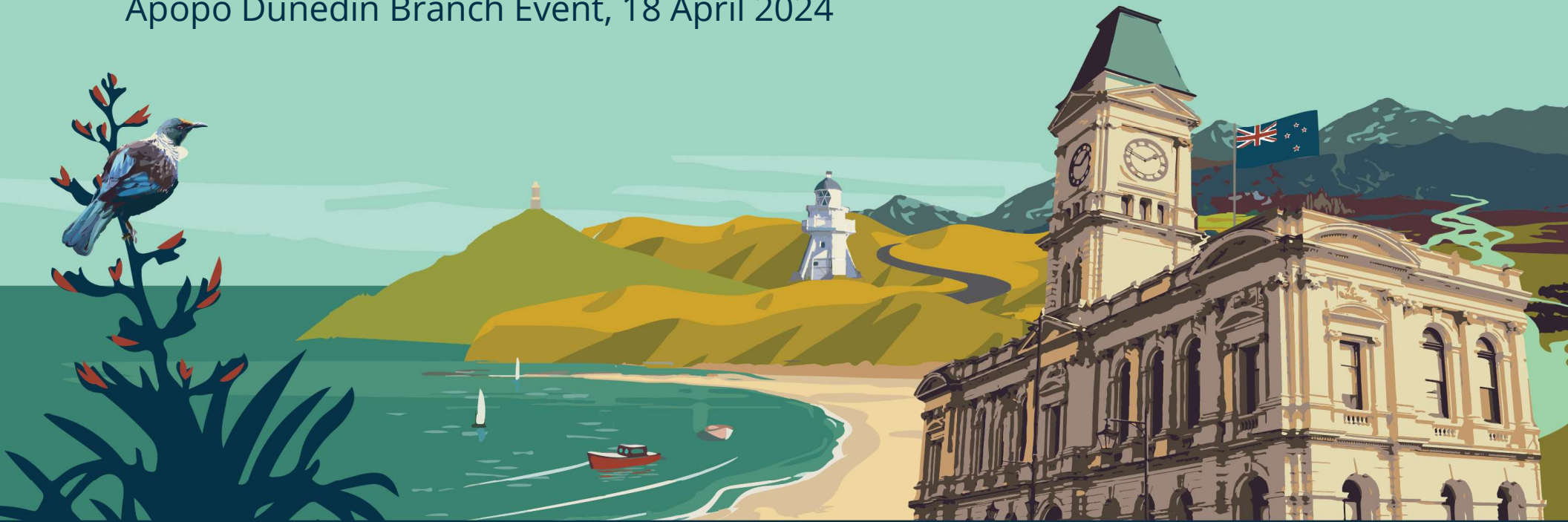


# Hydraulic modelling as an asset management tool

Āpōpō Dunedin Branch Event, 18 April 2024



Michael Goldingham and Paul Hayes



**Waitaki**  
DISTRICT COUNCIL  
TE KAUNIHERA Ā ROHE O WAITAKI

# Hydraulic modelling as an asset management tool

## Overview

- Introduction to Waitaki DC Water Services Team
- What is hydraulic modelling? How do we do it?
- How is the use of hydraulic models integrated across the Water Services Team?
- Modelling as an asset management tool



# What we do

The Water Services Team provides, maintains, protects and manages:



**1,800km** of water pipes

**203km** of wastewater pipes

**15** water supplies

**8** wastewater systems

**8** stormwater systems



## WATER SERVICES

**\$13.55**  
WATER SUPPLY  
15 water supplies  
1,800km of water pipes

**\$4.36**  
SEWERAGE & WASTEWATER TREATMENT  
8 wastewater systems

**47c**  
STORM-WATER DISPOSAL

**\$18.38**  
per week

**\$58.91**

Total rates per week per property (average)  
Does not apply to every ratepayer. Some will pay more, and some less, depending on location and property value.



# MAPPING THE CHALLENGE

**BIG DISTRICT. SMALL POPULATION.**

Compared to the 67 districts in New Zealand, we're **HUGE** in size (11<sup>th</sup> biggest in area) with a small rating base (44<sup>th</sup> in population). This means we have relatively fewer ratepayers to share the costs of infrastructure and services. It also means a lot of ground to cover for Council staff and contractors, plus a LOT of infrastructure needed to keep our communities connected.

The average annual household income here is: **\$95,721** (\$127,423 nationally) \*  
The median annual household income here is: **\$80,273** (\$109,044 nationally) \*

**AHURIRI WARD**  
Area: 4,304km<sup>2</sup>  
Population: 2,040  
Rateable properties: 1,924

**Total area 7,216km<sup>2</sup>**  
**Total population 24,360**  
**Total rateable properties 14,007**

**That's 3.37 people per km<sup>2</sup>**  
Compared to:  
Gore: 10.41  
Timaru: 17.90  
Dunedin: 40.96  
Invercargill: 148.46  
Christchurch: 279.97

**CORRIEDALE WARD**  
Area: 1,553km<sup>2</sup>  
Population: 4,920  
Rateable properties: 2,573

**ŌAMARU WARD**  
Area: 39km<sup>2</sup>  
Population: 14,900  
Rateable properties: 7,274

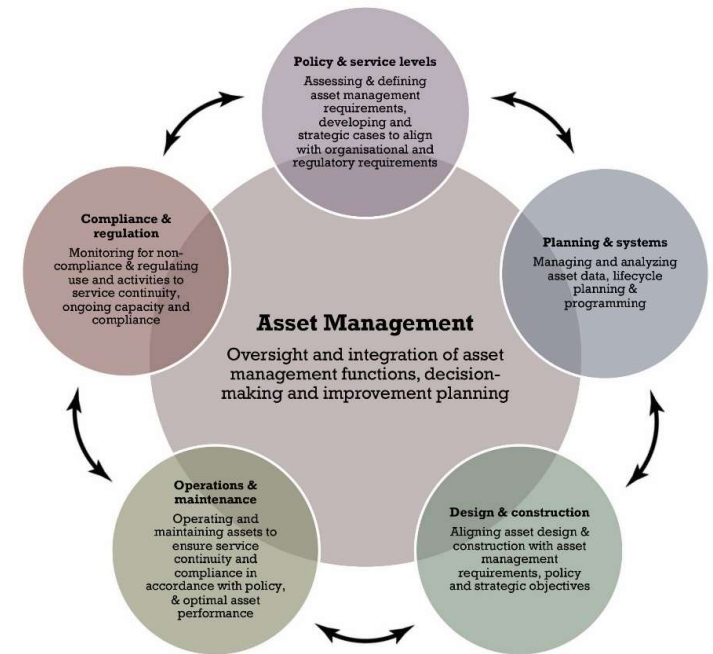
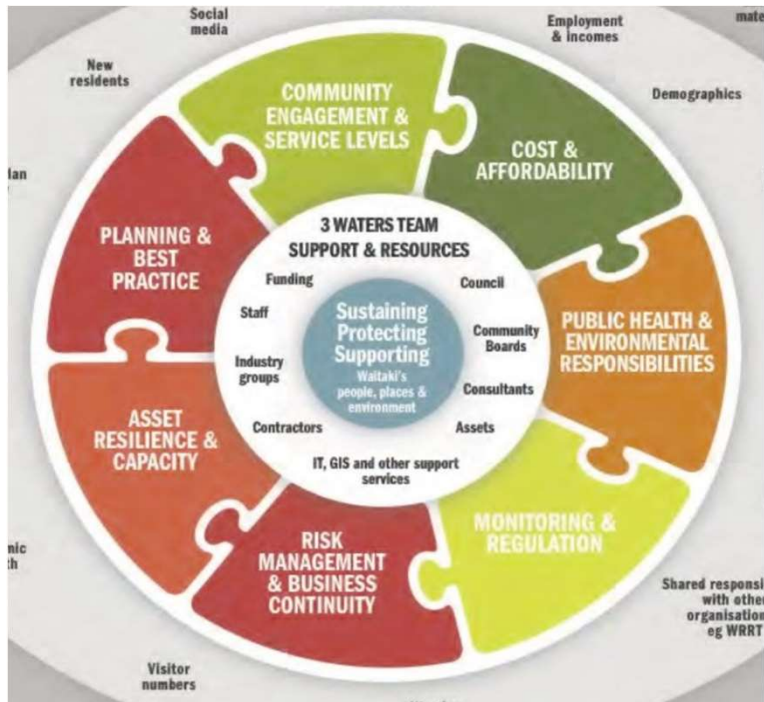
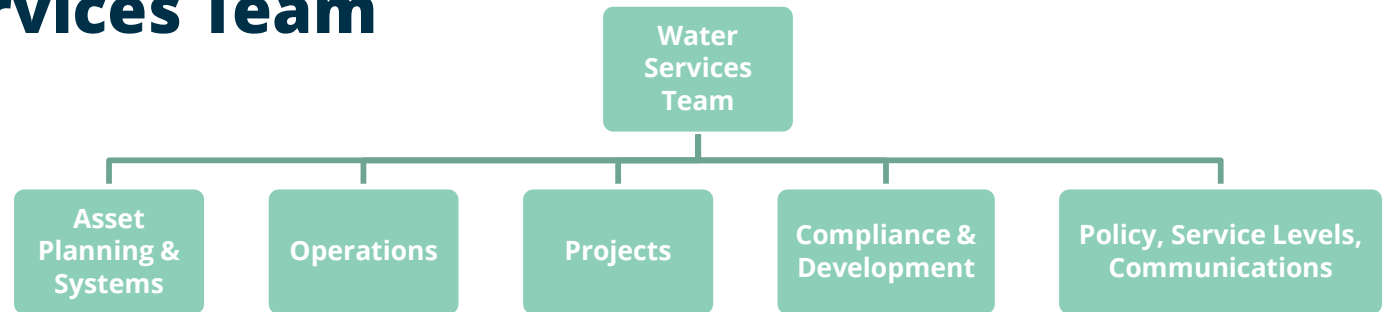
**WAIHEMO WARD**  
Area: 1,321km<sup>2</sup>  
Population: 2,500  
Rateable properties: 2,236

(It's a 310km drive between the Waitaki communities of Nenthorn and Lake Ōhau!)

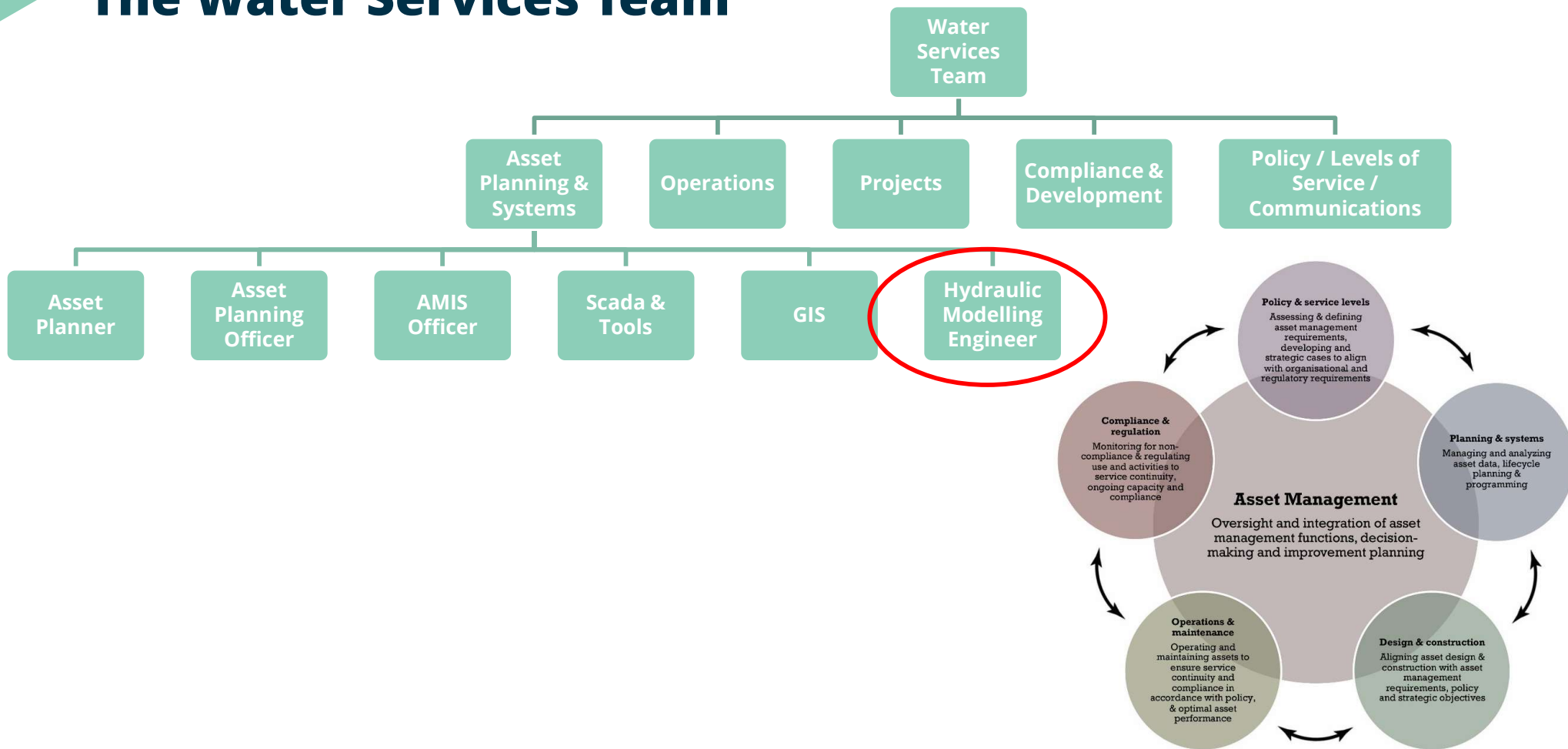




# The Water Services Team

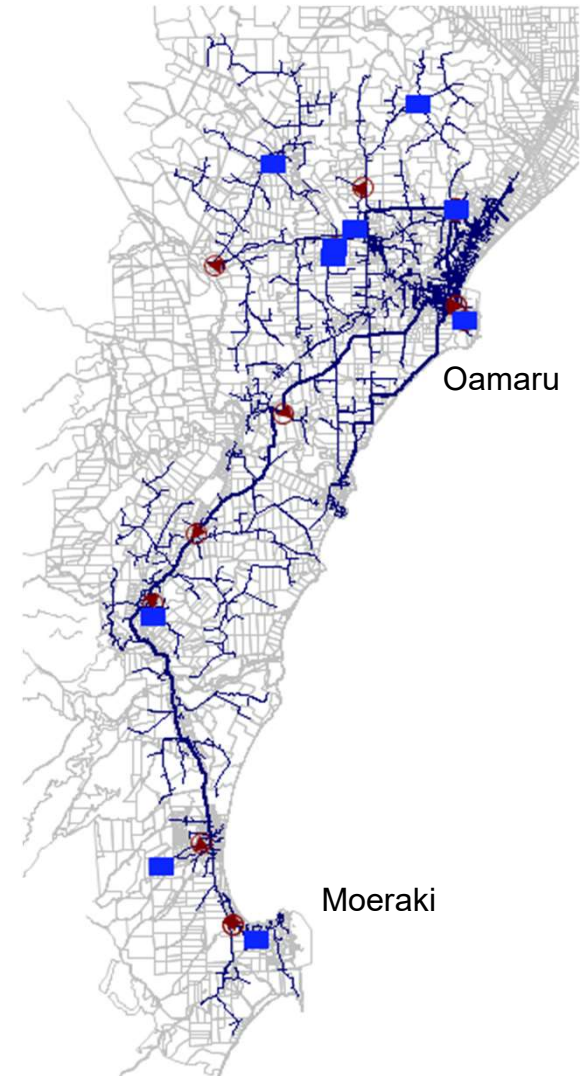
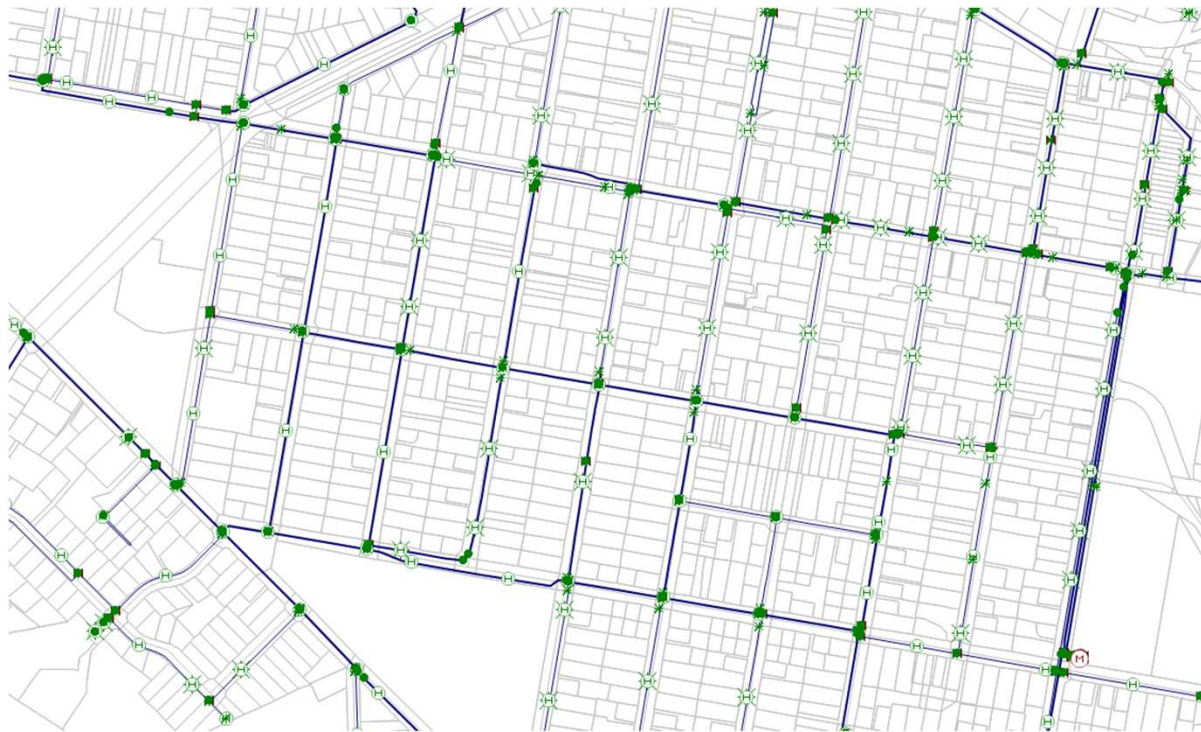


# The Water Services Team



# Water models

- Infoworks WS Pro
- 11 water supply networks modelled



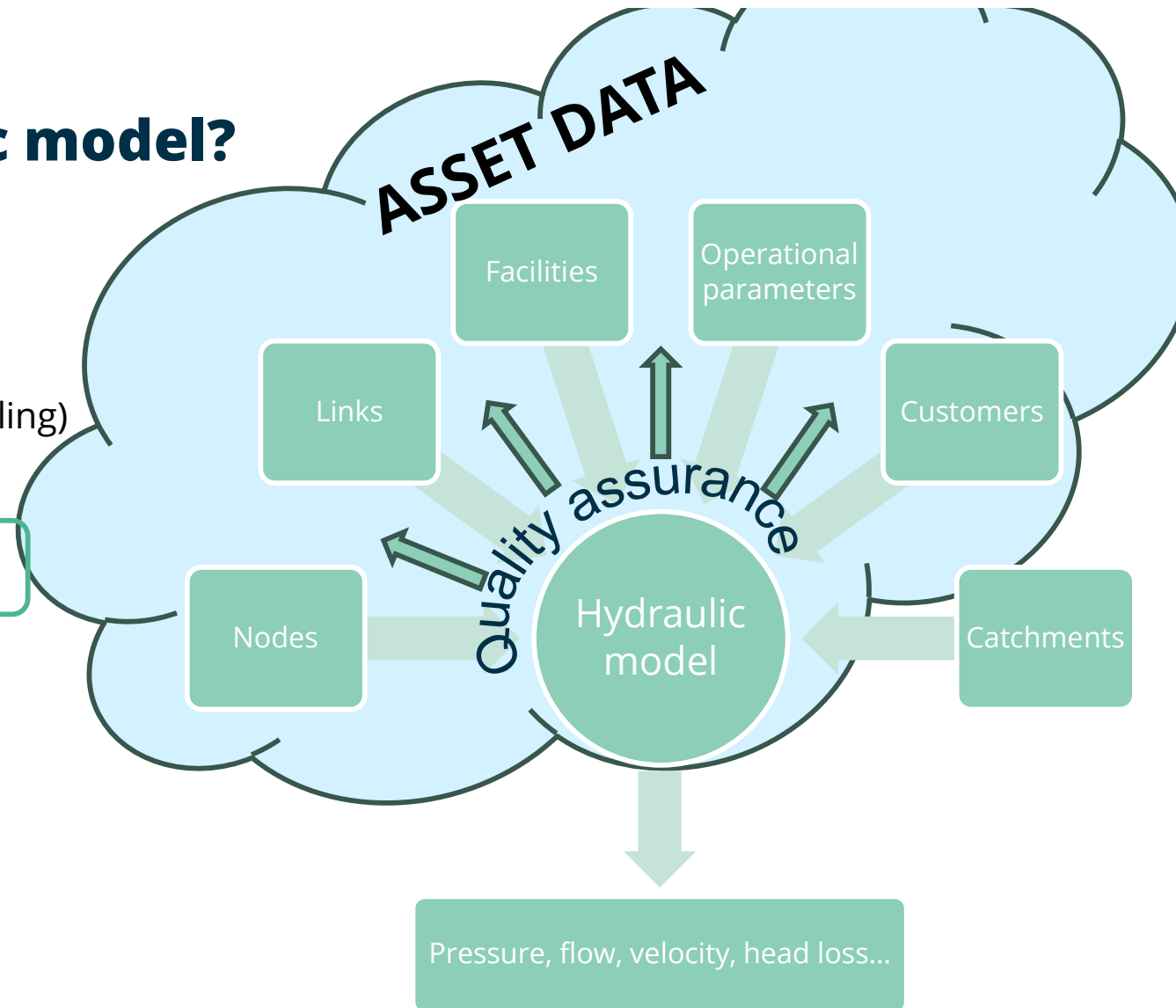




## What is a hydraulic model?

- Asset management system
- GIS system
- Financial system (ratings, billing)
- As-built plans
- O&M manuals
- Scada
- Data loggers
- Survey, Lidar
- Informal knowledge
- Assumptions (guesses?)
- Field verification

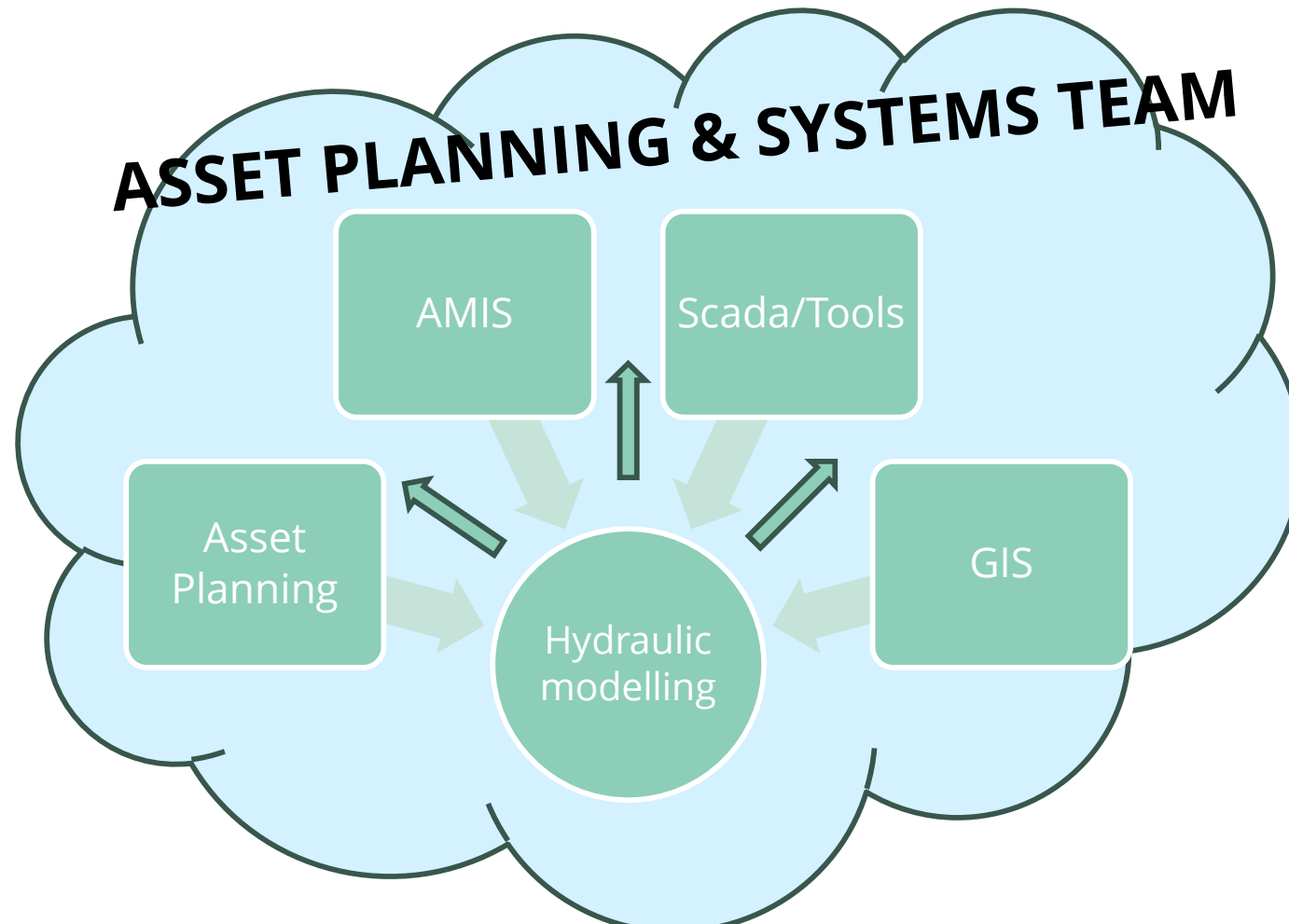
Calibration



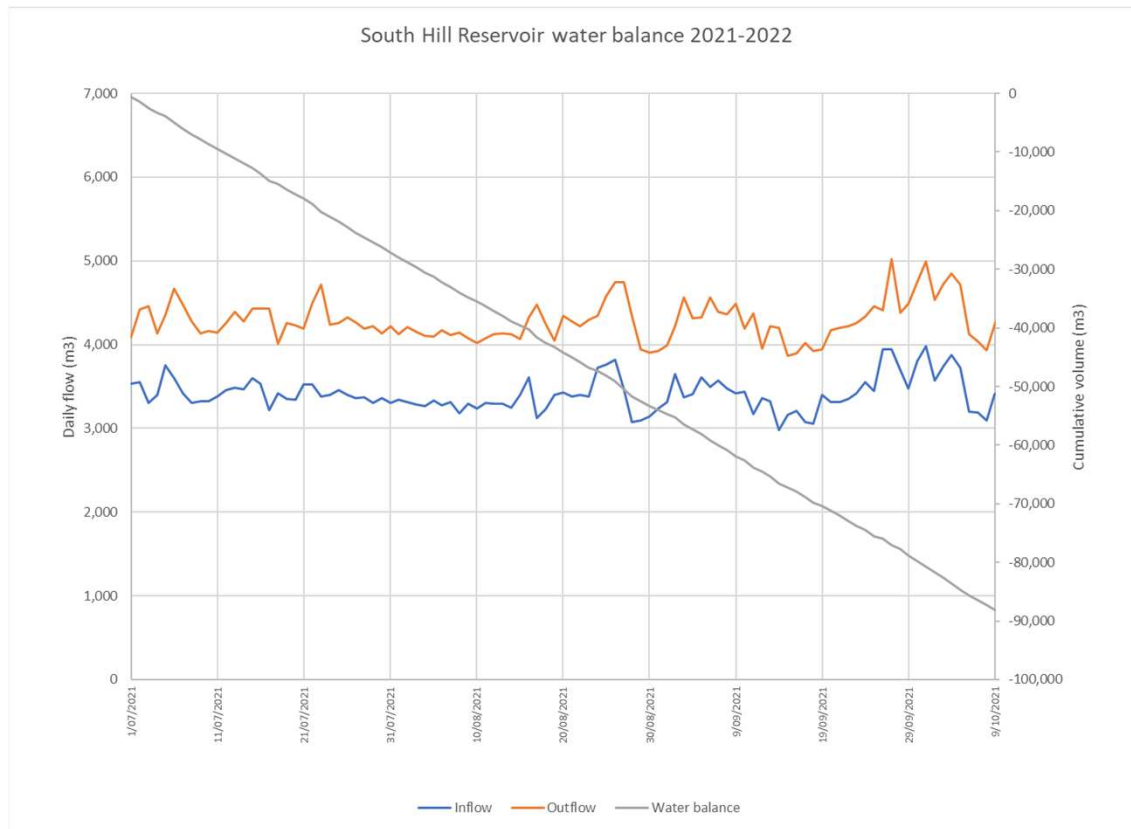
Pressure, flow, velocity, head loss...



## How does modelling sit within AP&S team?



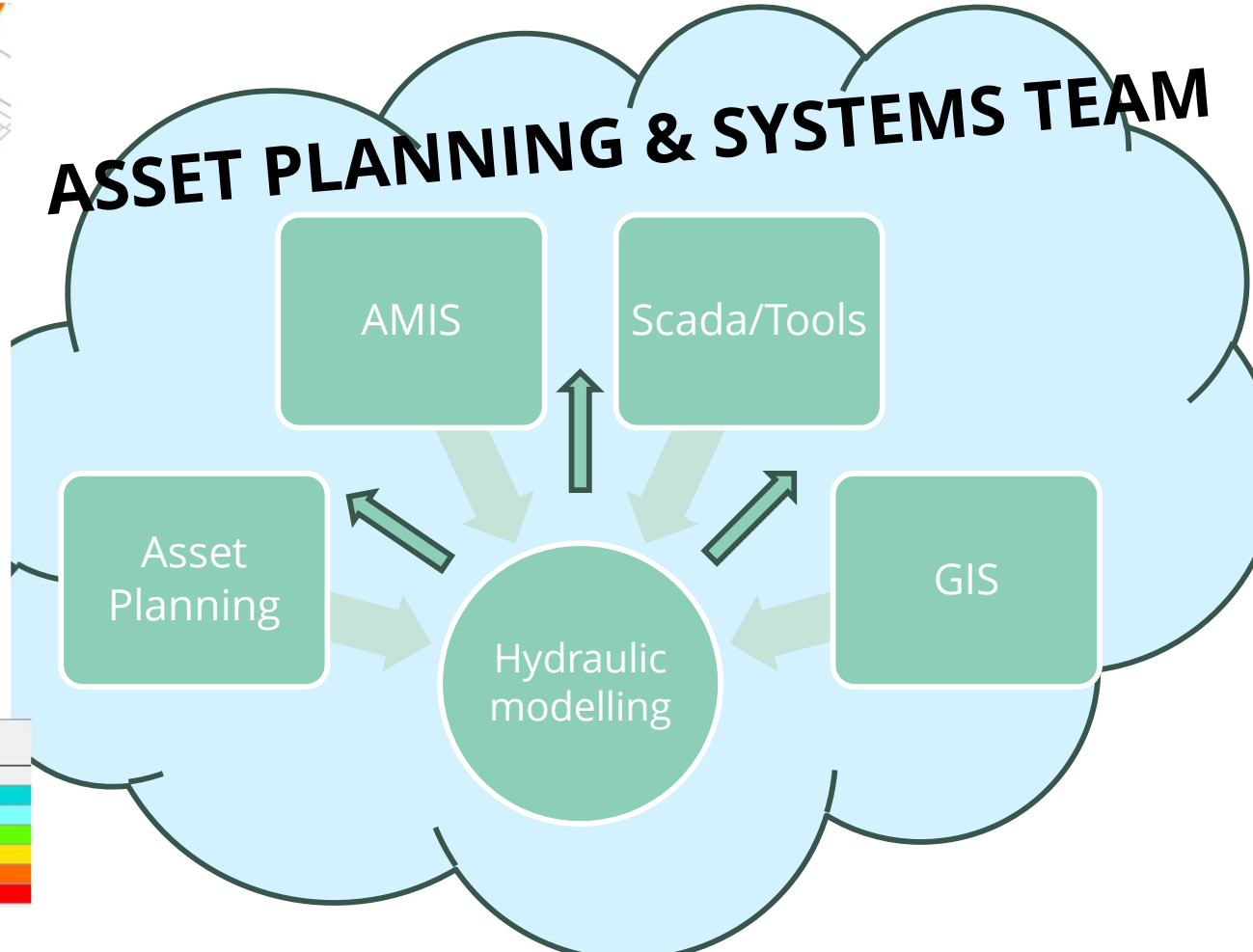
# Using and improving asset and Scada data



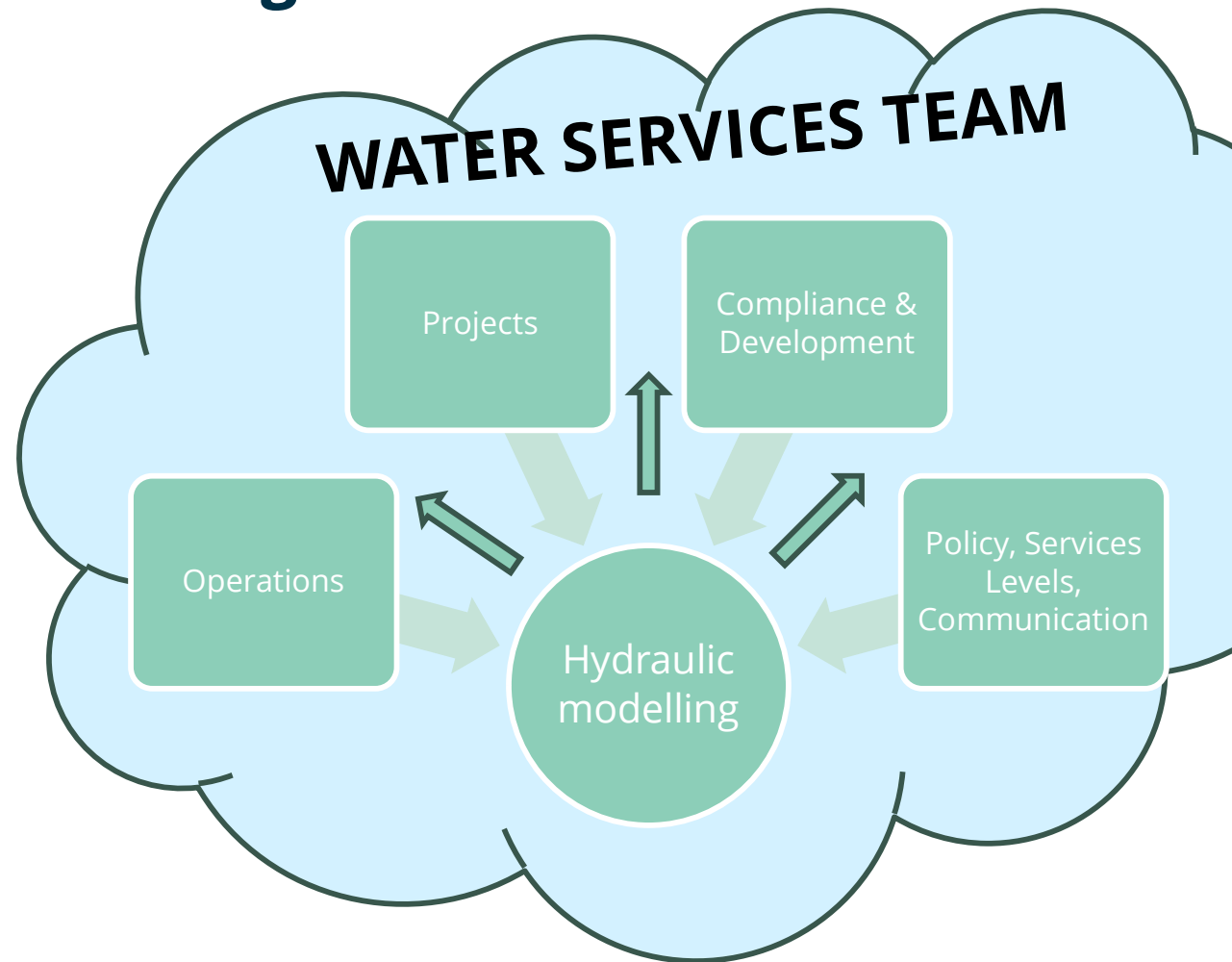
# Hydraulic input to renewals planning



## ASSET PLANNING & SYSTEMS TEAM

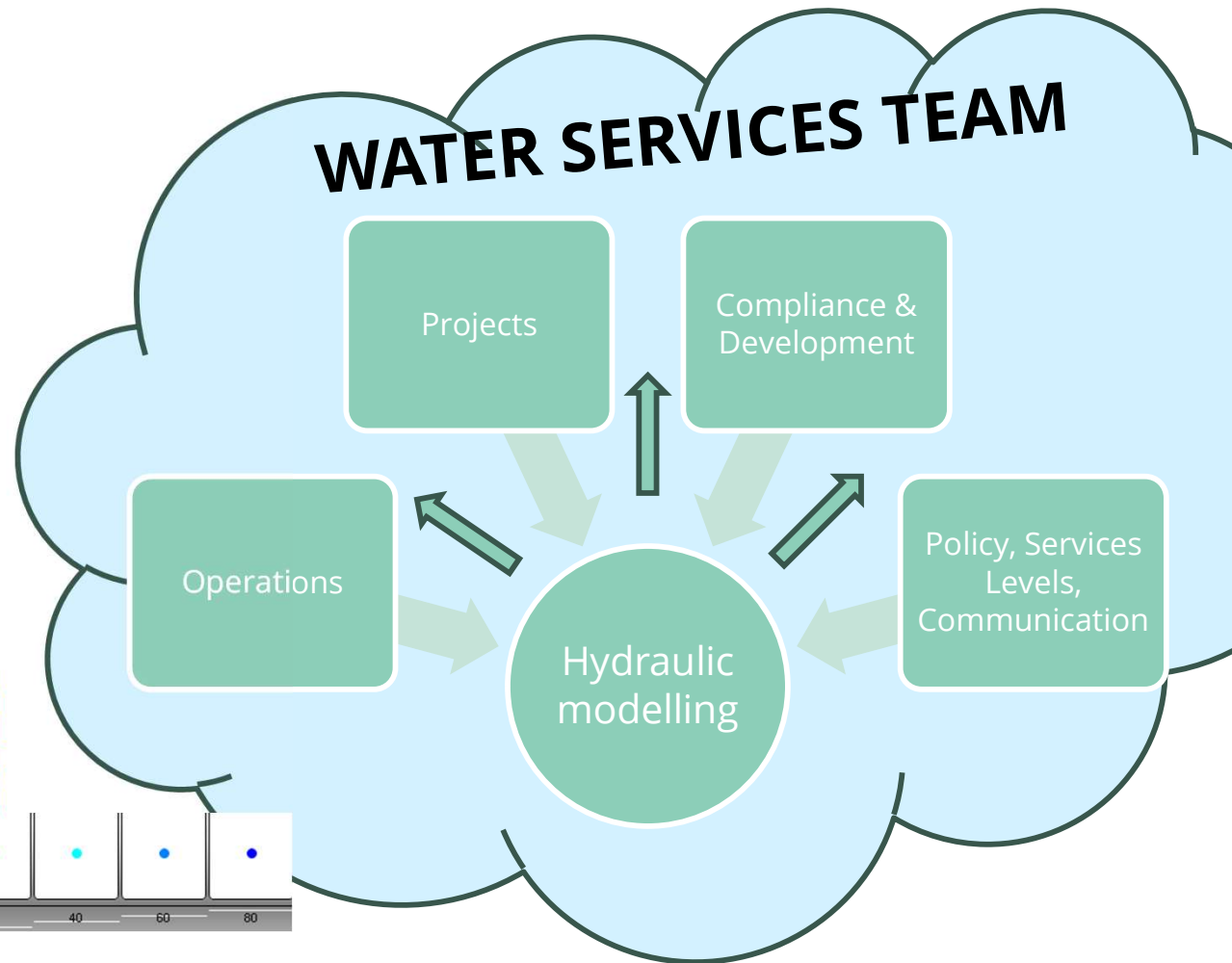
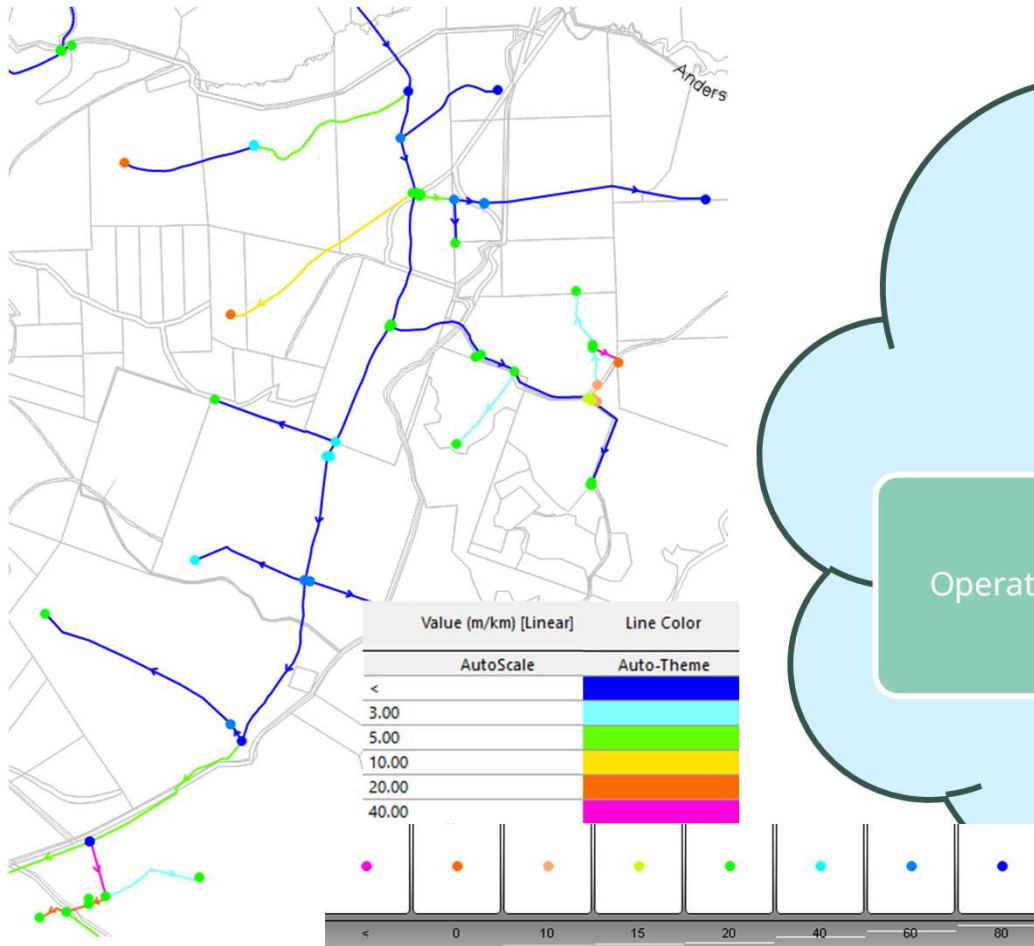


## How does hydraulic modelling sit within wider team?

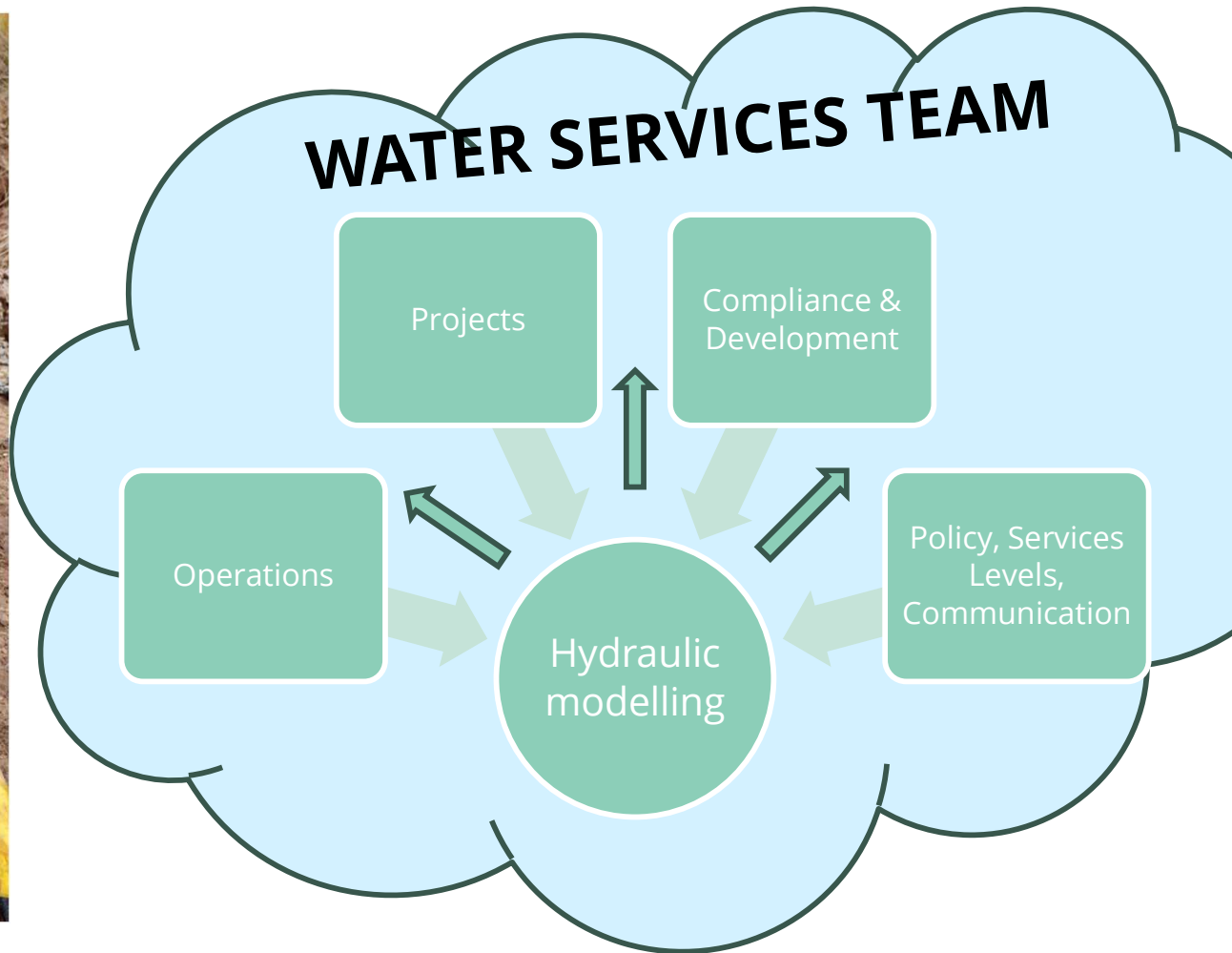




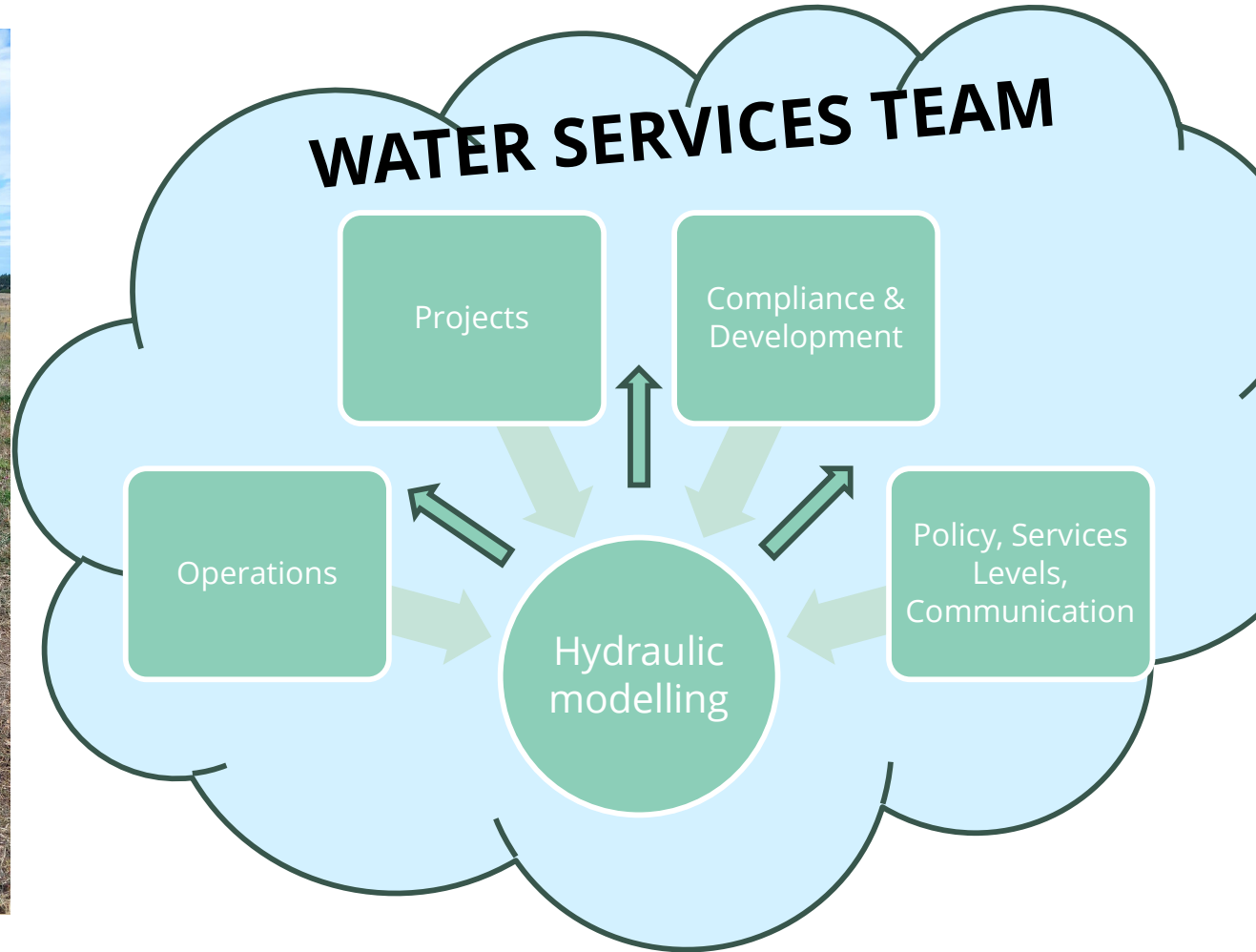
# Visibility of the network



## Network management - leak detection

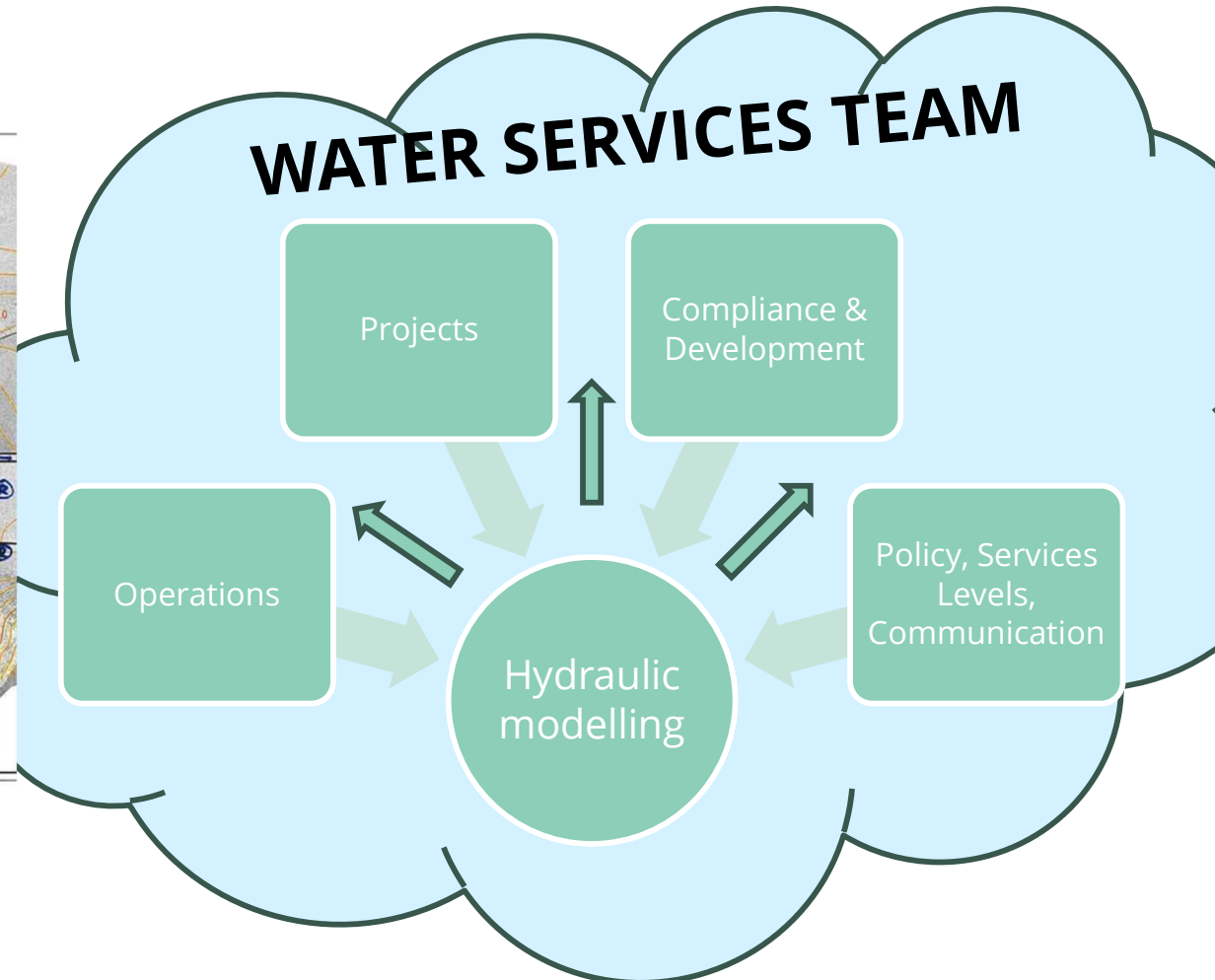
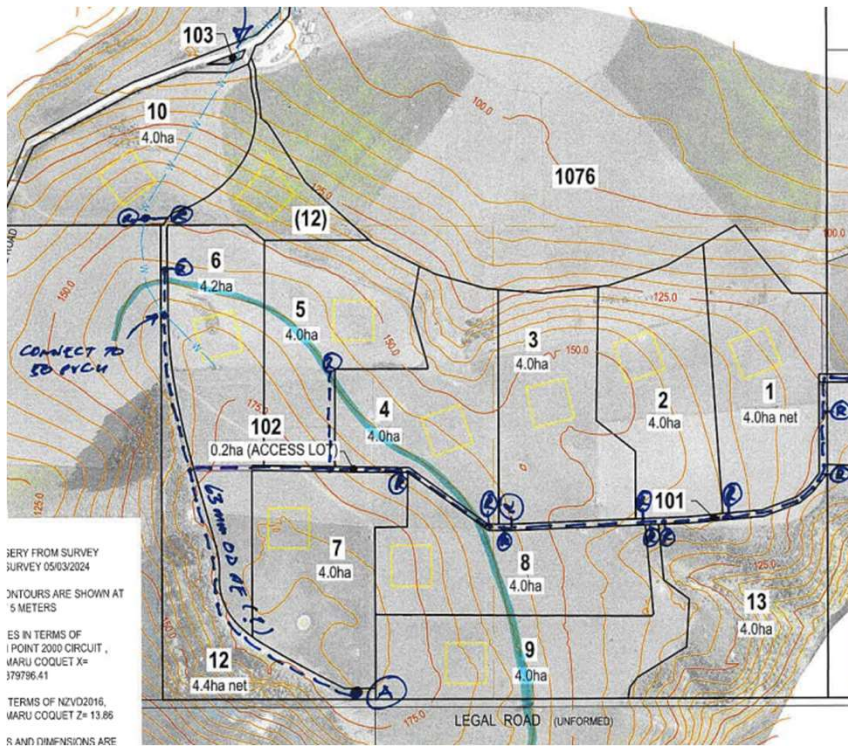


# Design



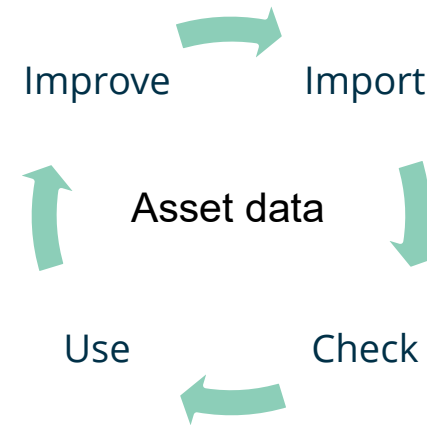
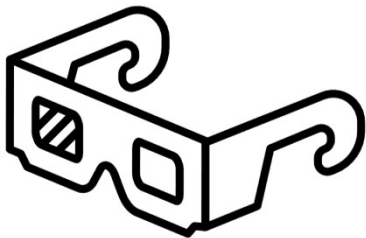
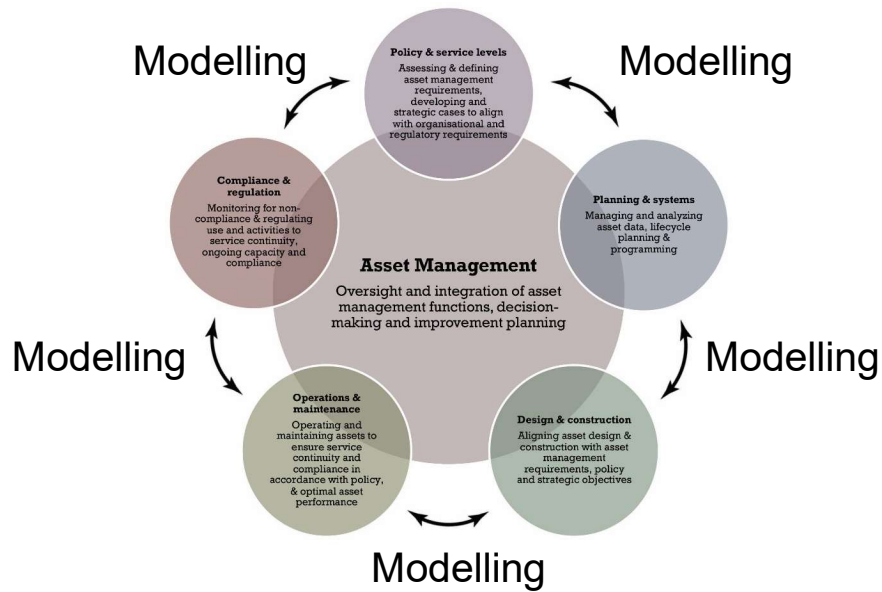


# Dealing with growth





# Modelling as an asset management tool



# Thank you. Questions?



**Waitaki**

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[www.waitaki.govt.nz](http://www.waitaki.govt.nz)

**Waitaki District Council**

03 433 0300 | [service@waitaki.govt.nz](mailto:service@waitaki.govt.nz)

20 Thames Street, Private Bag 50058, Oamaru 9444