



# **E. coli and Sediment**

Ruamahanga Whaitua Presentation

11/5/2016

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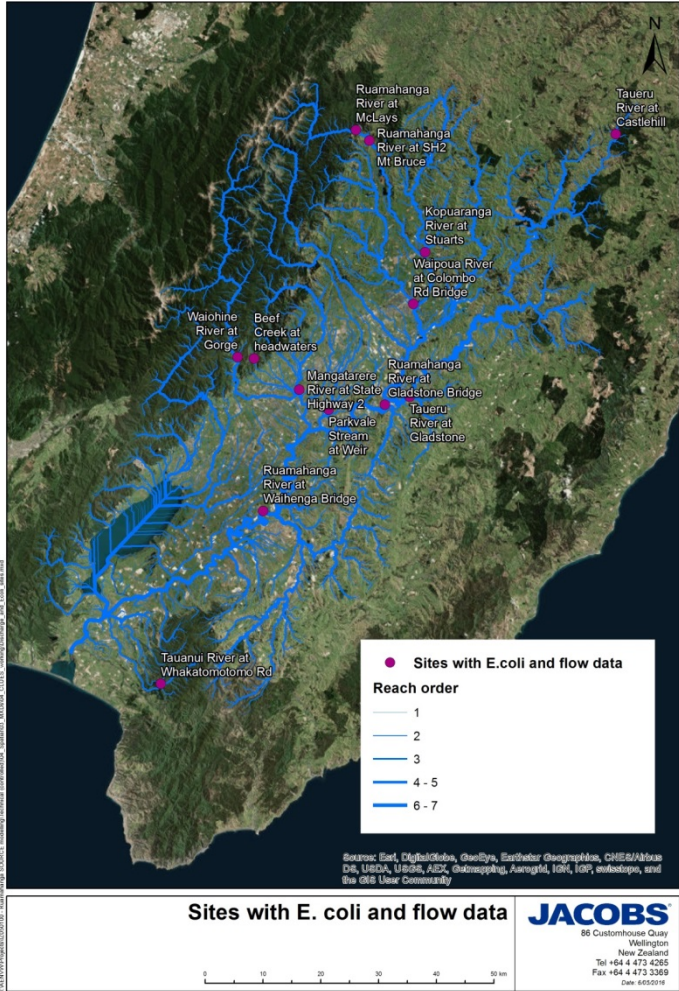
# Agenda

- E. coli
  - Data
  - Assumptions
  - Results
- Sediment
  - Data
  - Assumptions
  - Results

## **E. coli data**

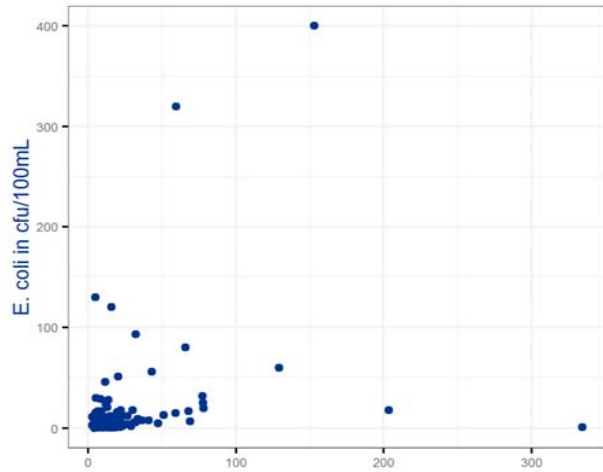
- Monthly water quality data
- Average annual load data

# E. coli data with flow

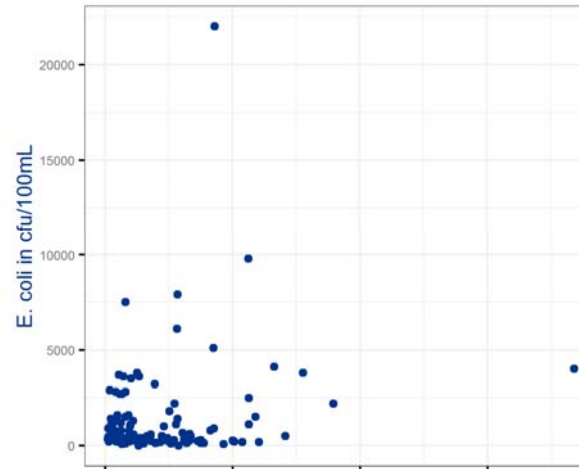


# E. coli data with flow

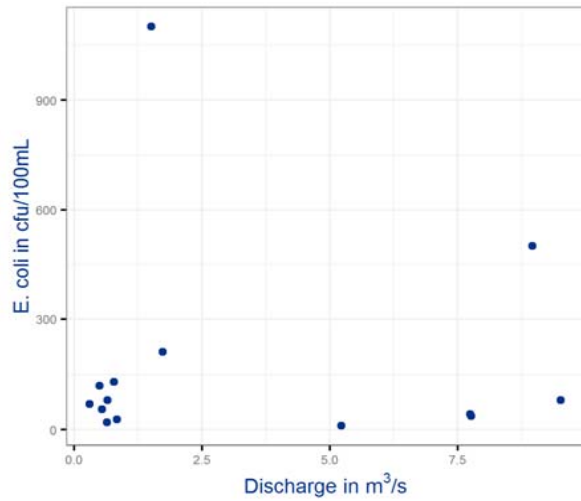
Waiohine River at Gorge  
E.coli versus discharge



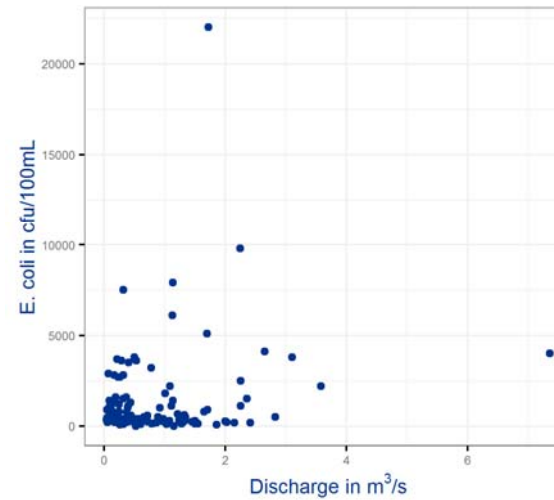
Parkvale Stream at Renalls Weir  
E.coli versus discharge



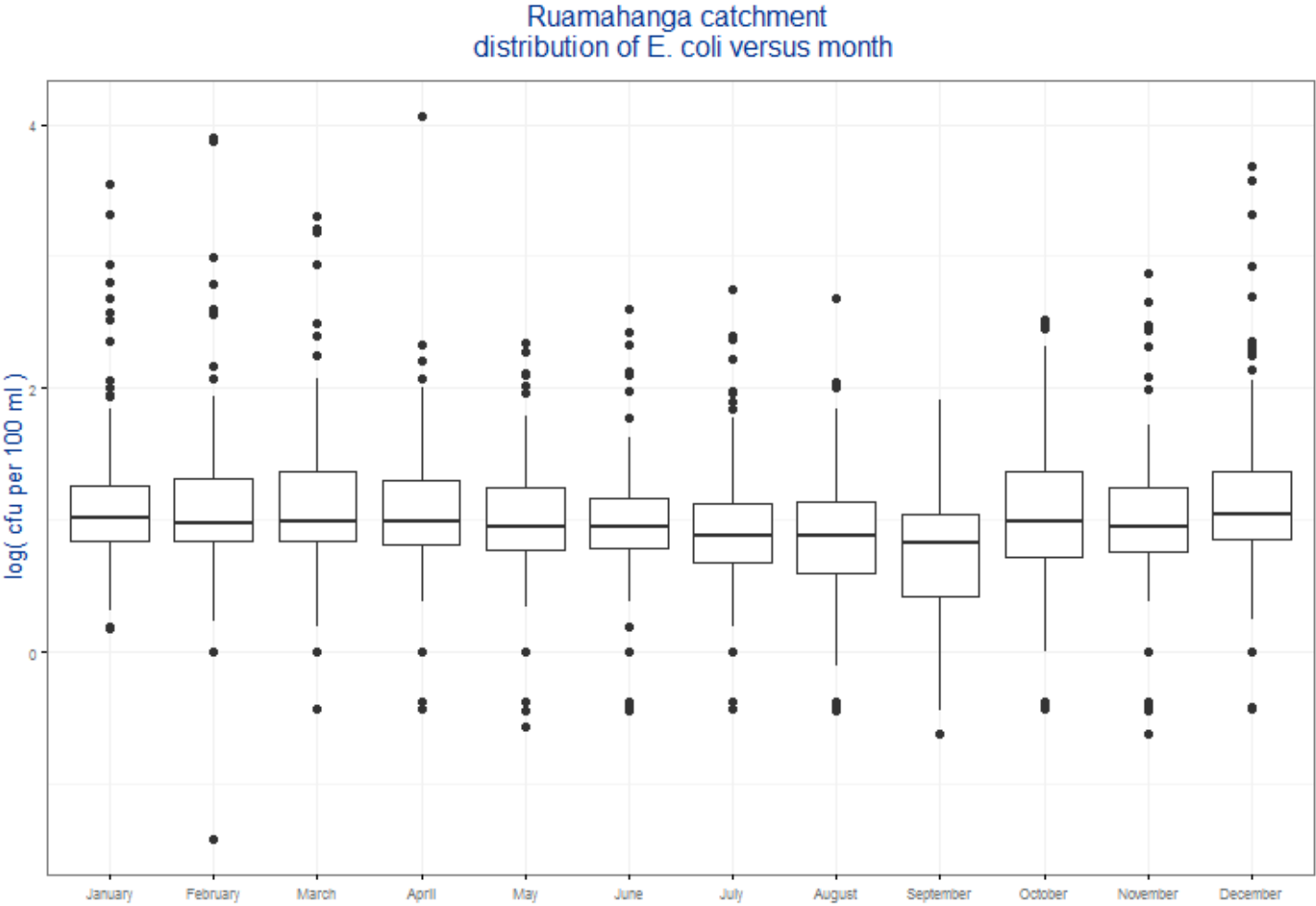
Waipoua River at Colombo  
E.coli versus discharge



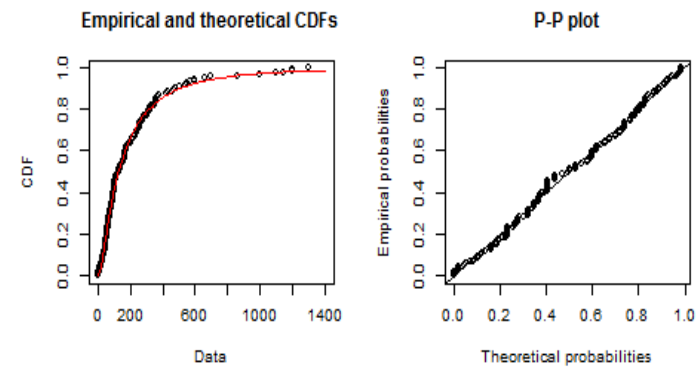
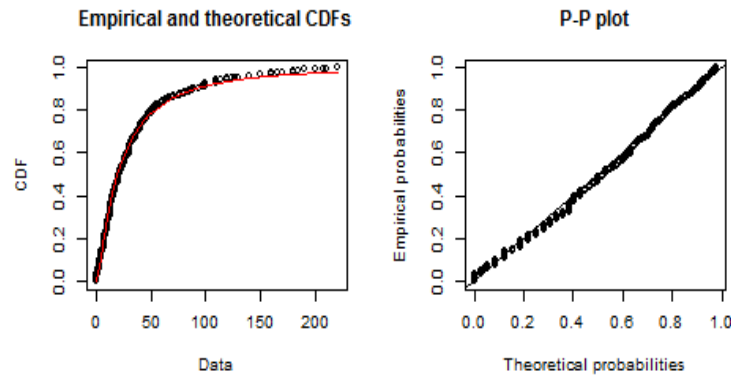
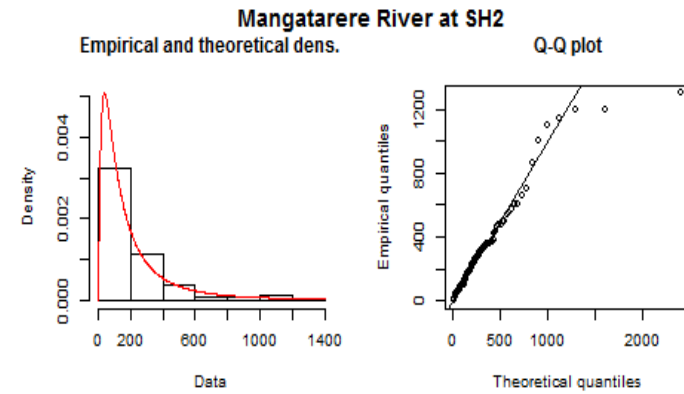
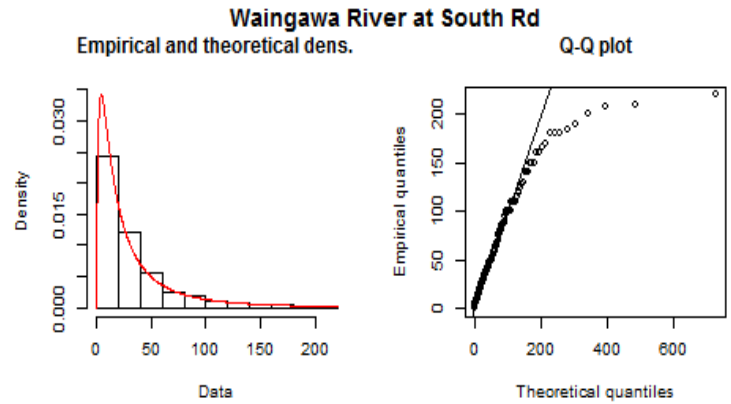
Parkvale Stream at Renalls Weir  
E.coli versus discharge



# E. coli data with time



# E. coli data distribution

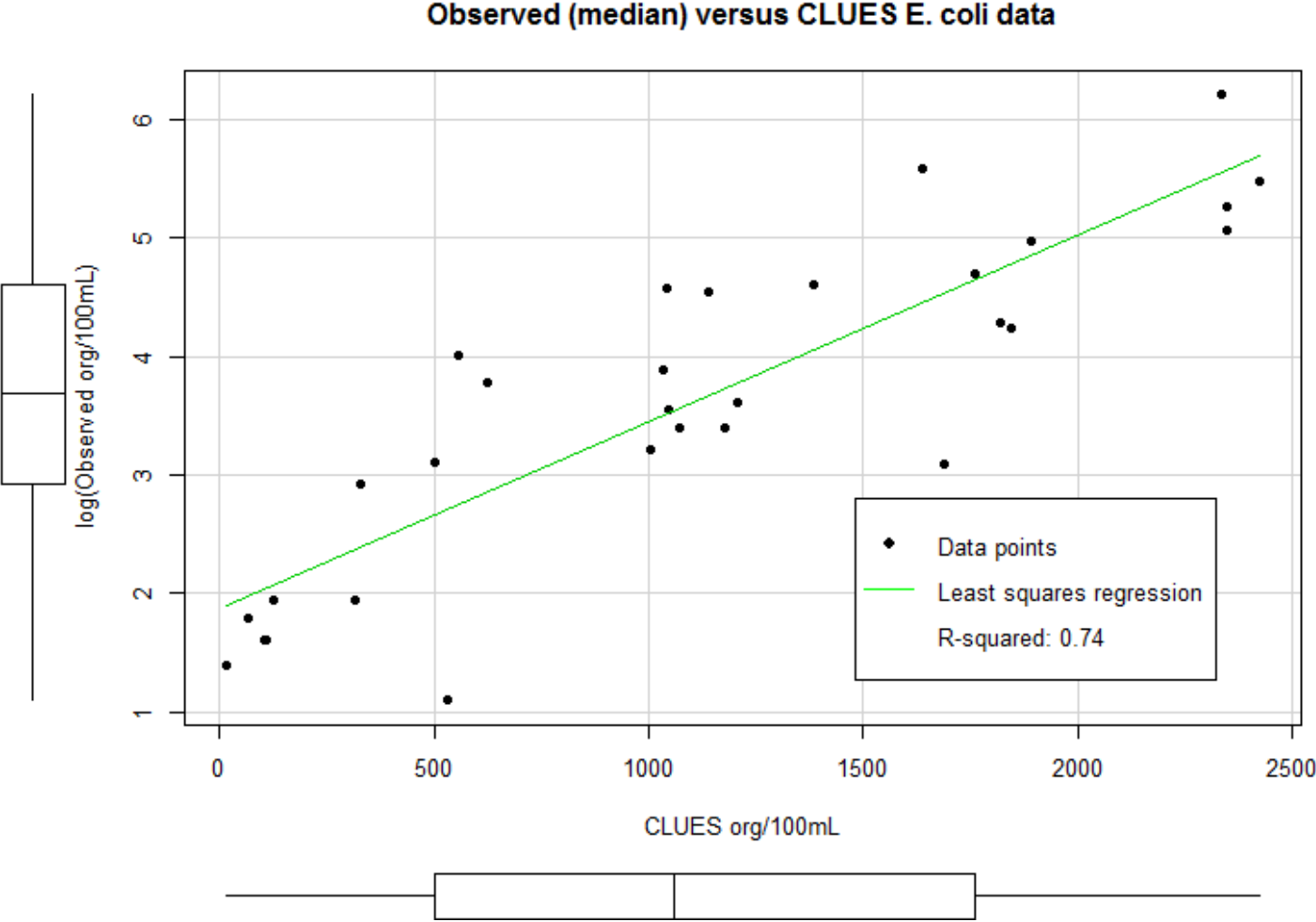


## CLUES average annual load data

- Catchment load
- Instream load



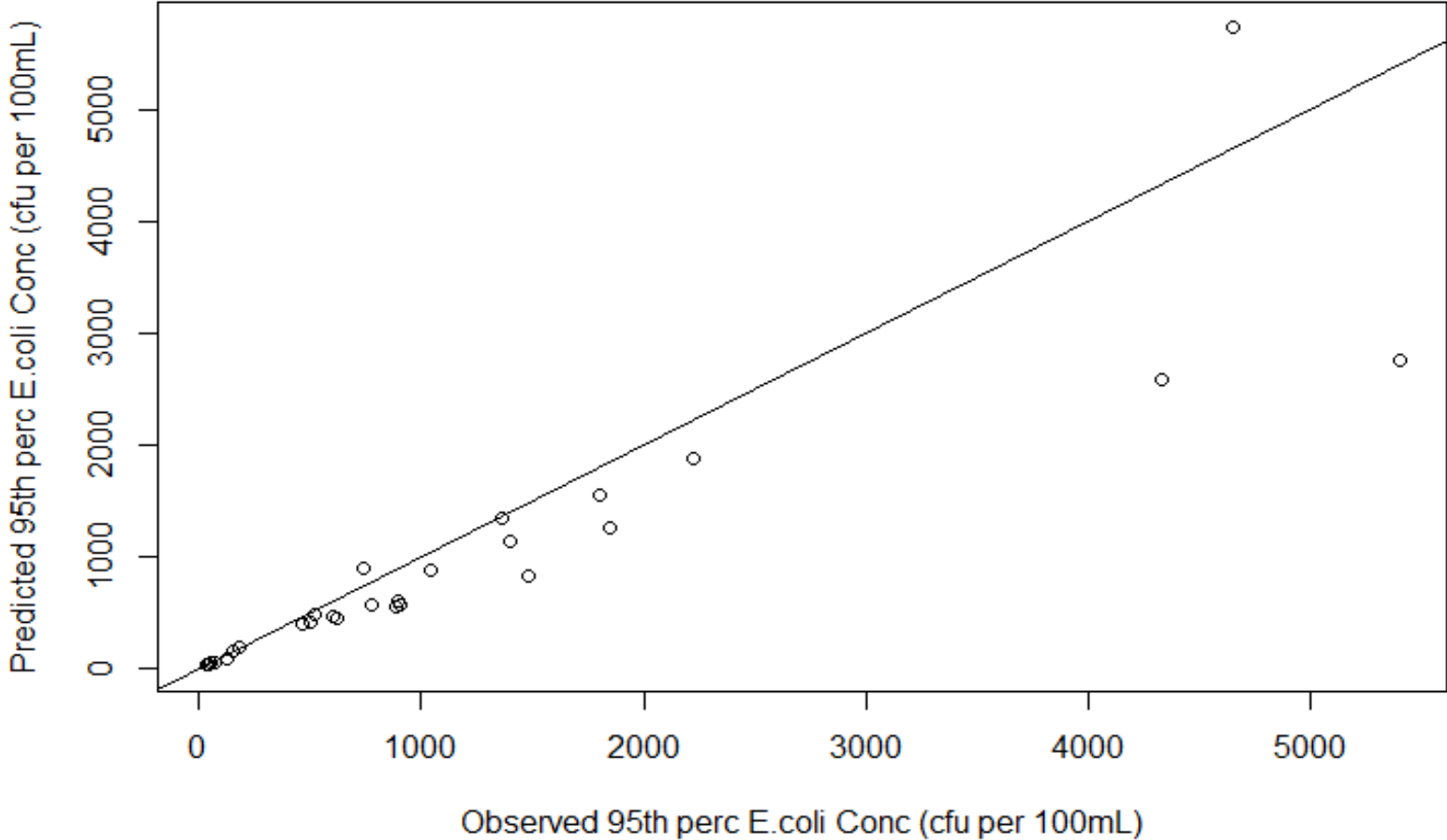
# E. coli average annual load data and concentration data



# Assumptions

- There is no strong evidence that there is a relationship between E. coli concentration and discharge.
- There is no strong evidence that E. coli concentrations are temporarily based throughout the catchment, although there is some evidence of temporal dependence at individual sites.
- There is a relationship between measured instream concentration and the CLUES predicted instream loads. Changes in predicted load in CLUES can be used to predict changes in concentrations.
- A log normal distribution represents the sample population and can be used to characterise the sample sets in locations where measured data is not available. Removed outliers >100 times the median.

# E. coli results



# E. coli results

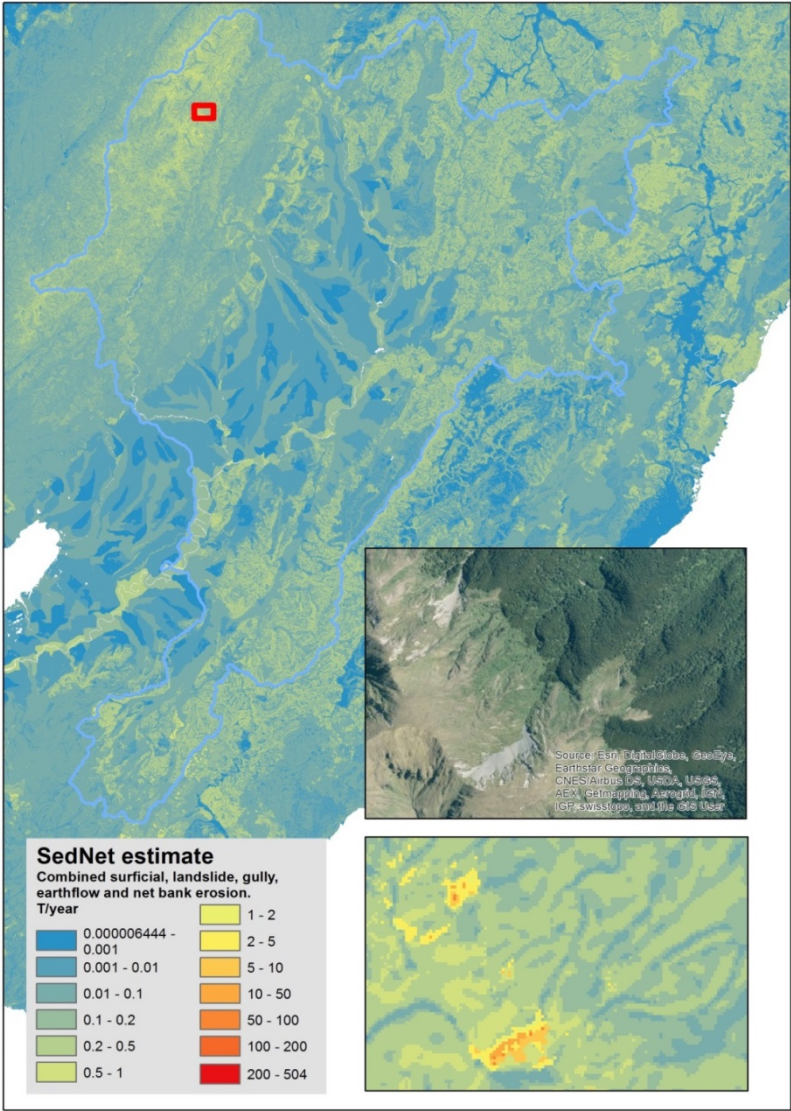
	observed median	observed 95th	predicted median	predicted 95th
Ruamahanga River at Double Bridges	55	520	58	492
Ruamahanga River at Morrisons Bush	24	622	29	450
Waiohine River at Gorge	3	46	3	33



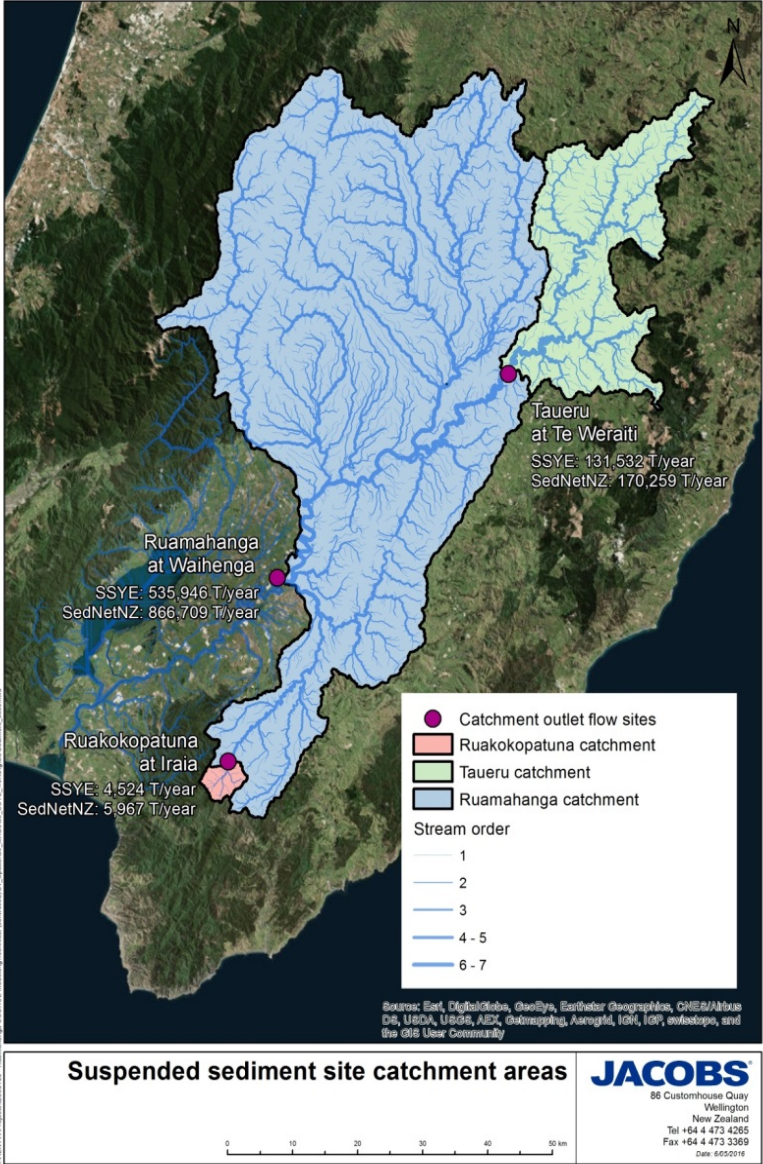
## Sediment data

- Suspended Sediment Yield Estimator (SSYE), used to predict average annual sediment loads.
- SedNet NZ used to predict average annual sediment loads.
- Suspended sediment concentration and high flow gaugings from Ministry of Works, used to fit the power curve.
- Monthly water quality data including total suspended sediment and turbidity data from GWRC used to determine the dry weather concentrations.
- Flow data for Ruamahanga catchment gauges from GWRC.

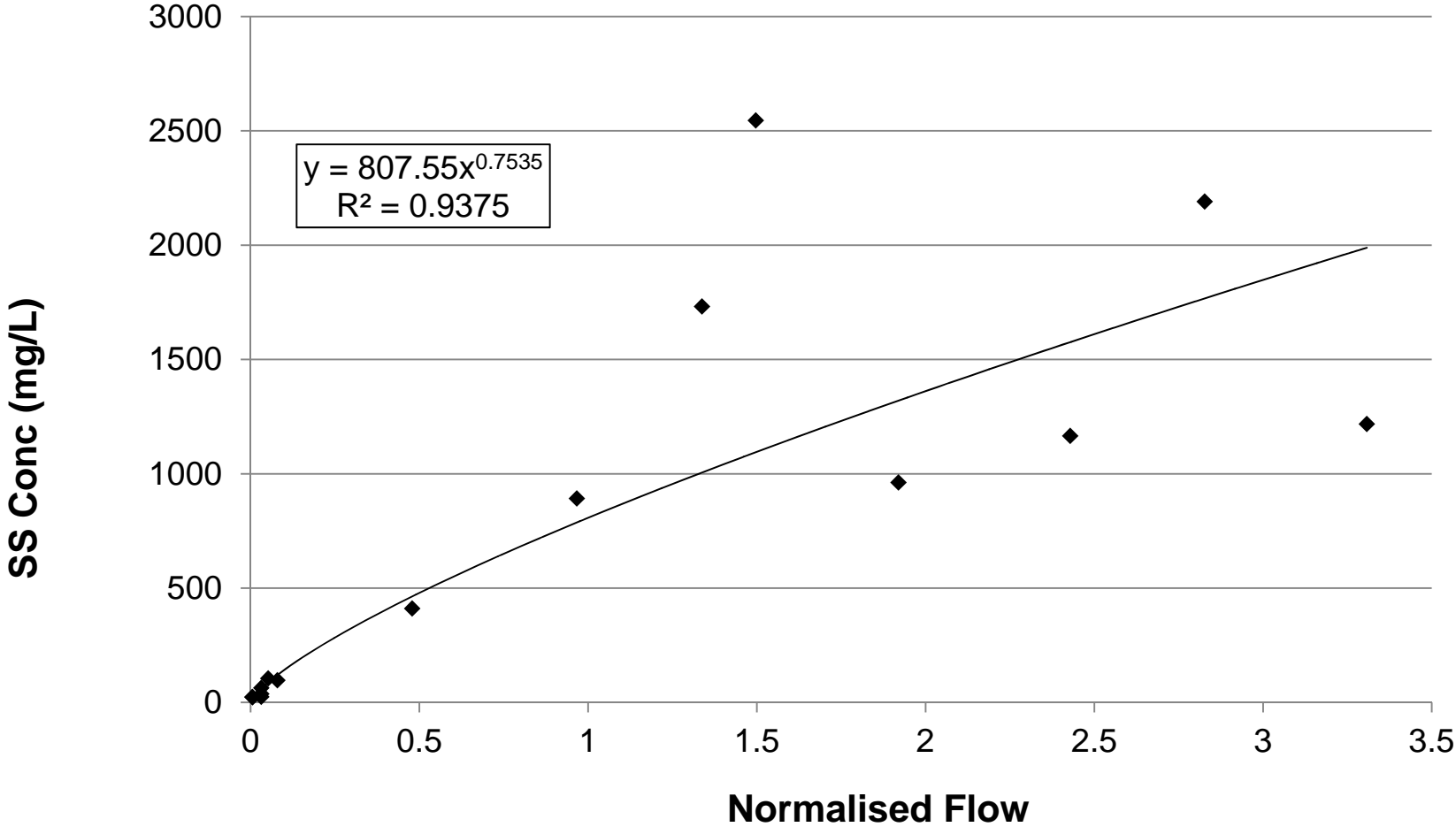
# Sediment load data SSYE and SedNetNZ



# High flow sediment data

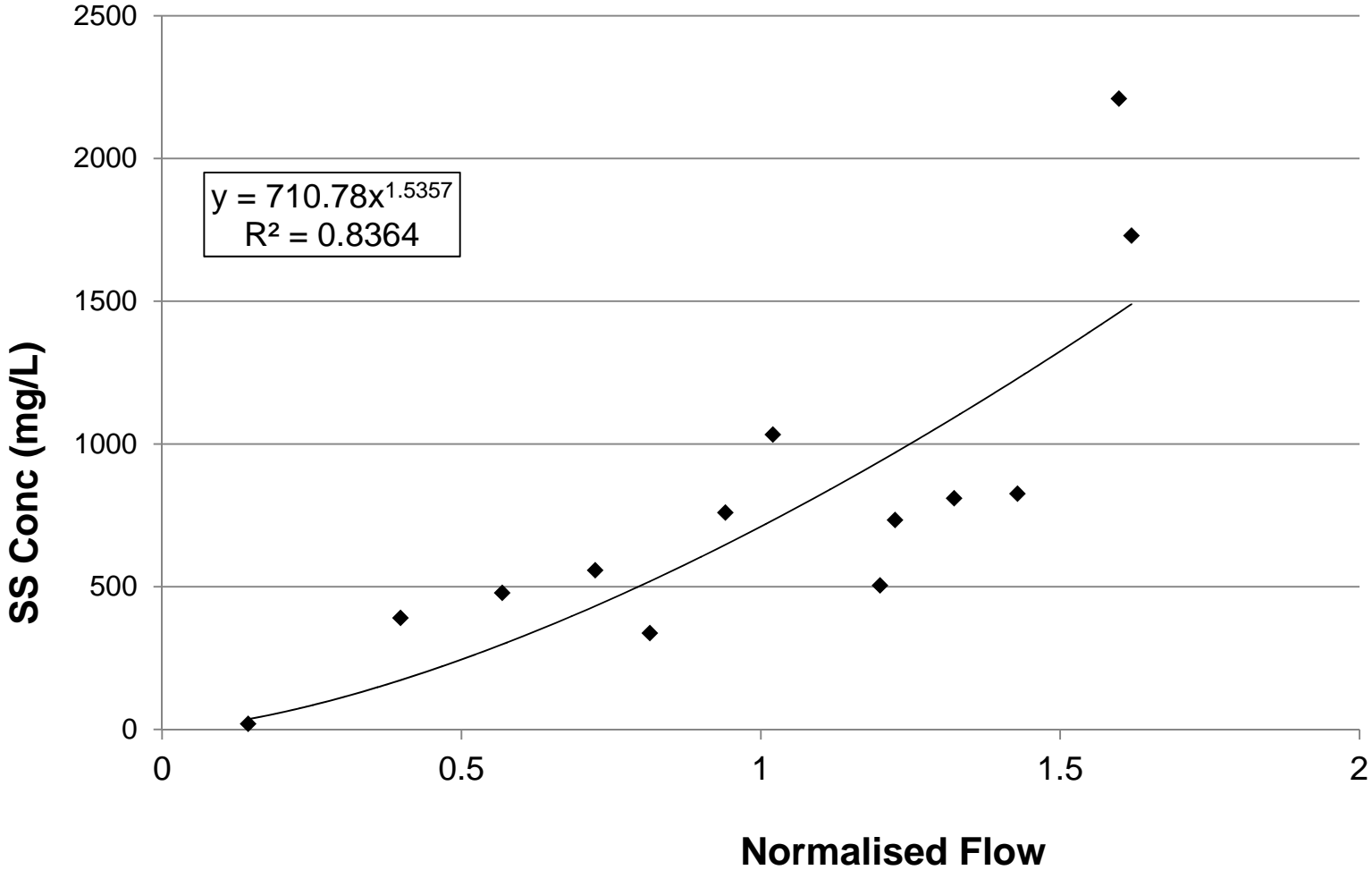


# High flow sediment gauging Taueru at Te Weraiti

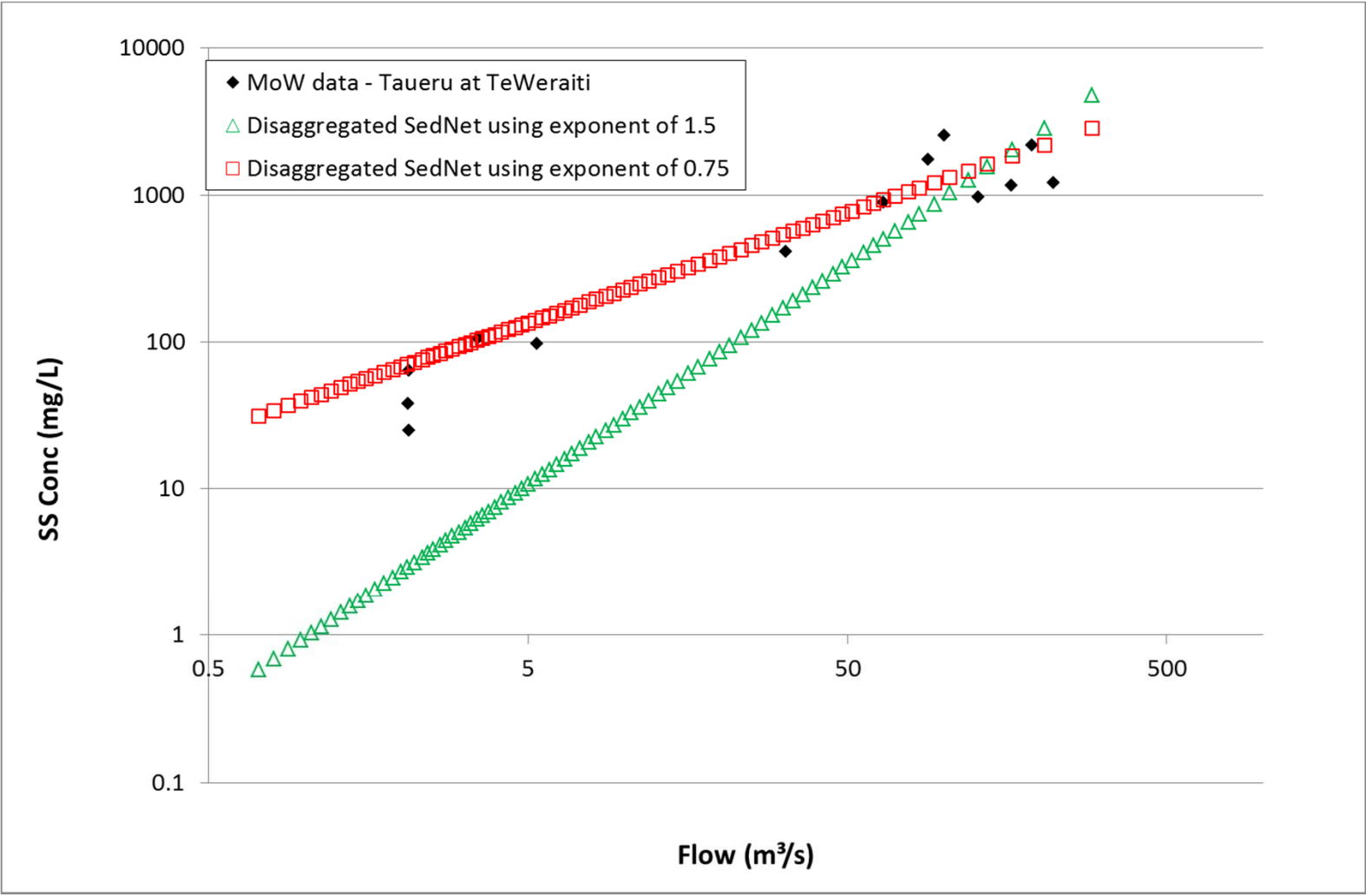




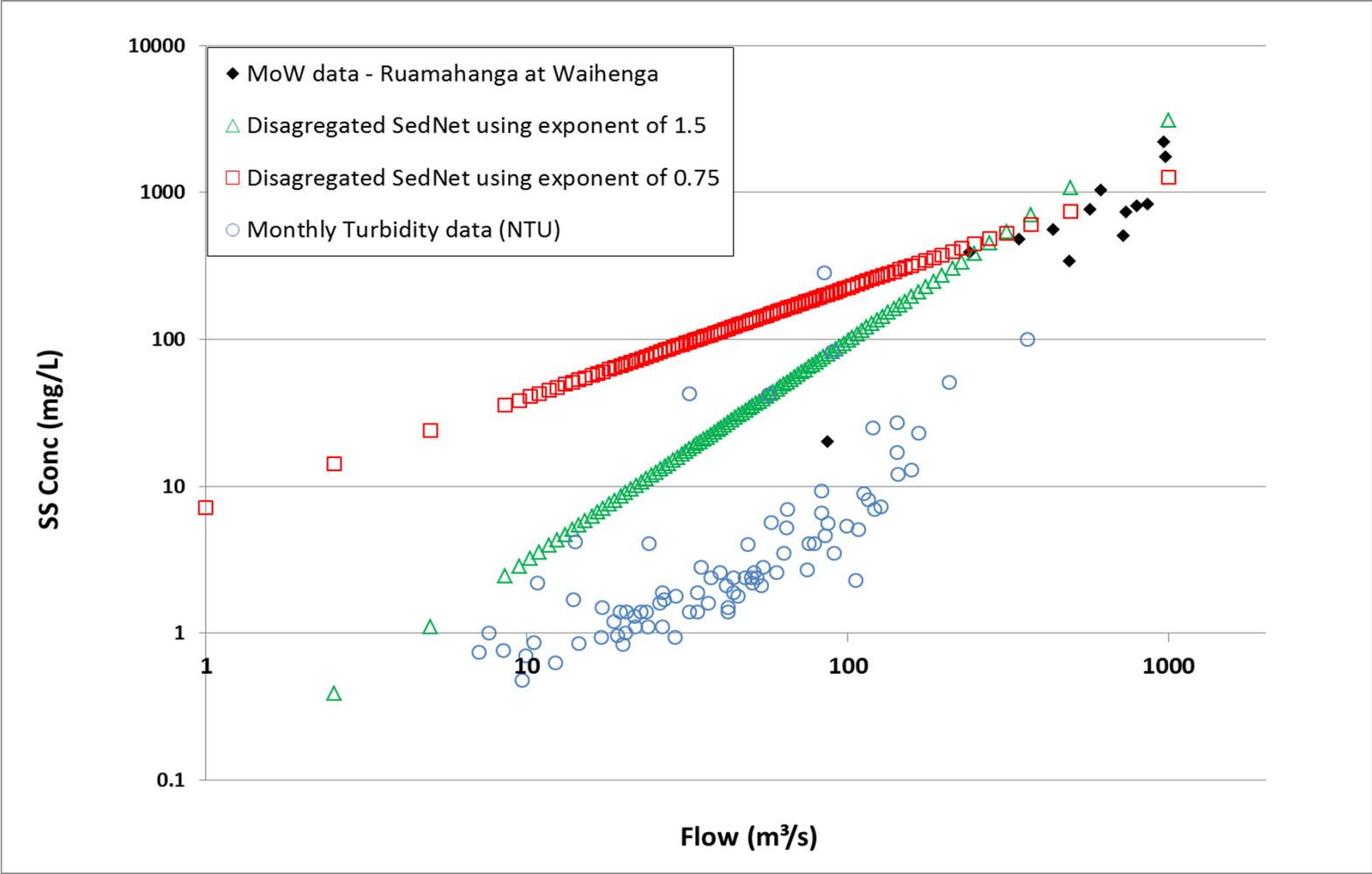
# High flow sediment gauging Ruamahanga at Waihenga



# Taueru at Te Weraiti



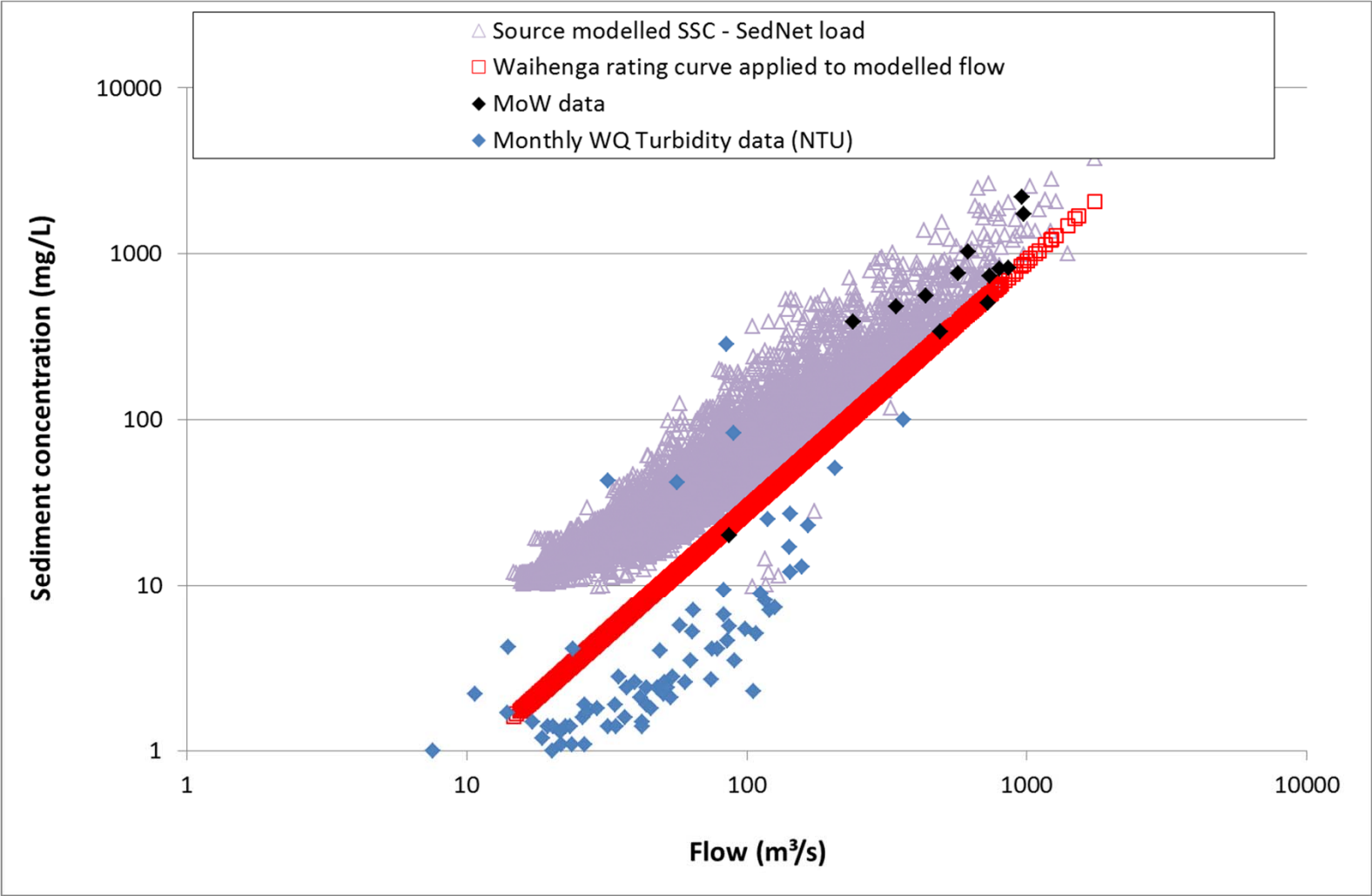
# Ruamahanga at Waihenga



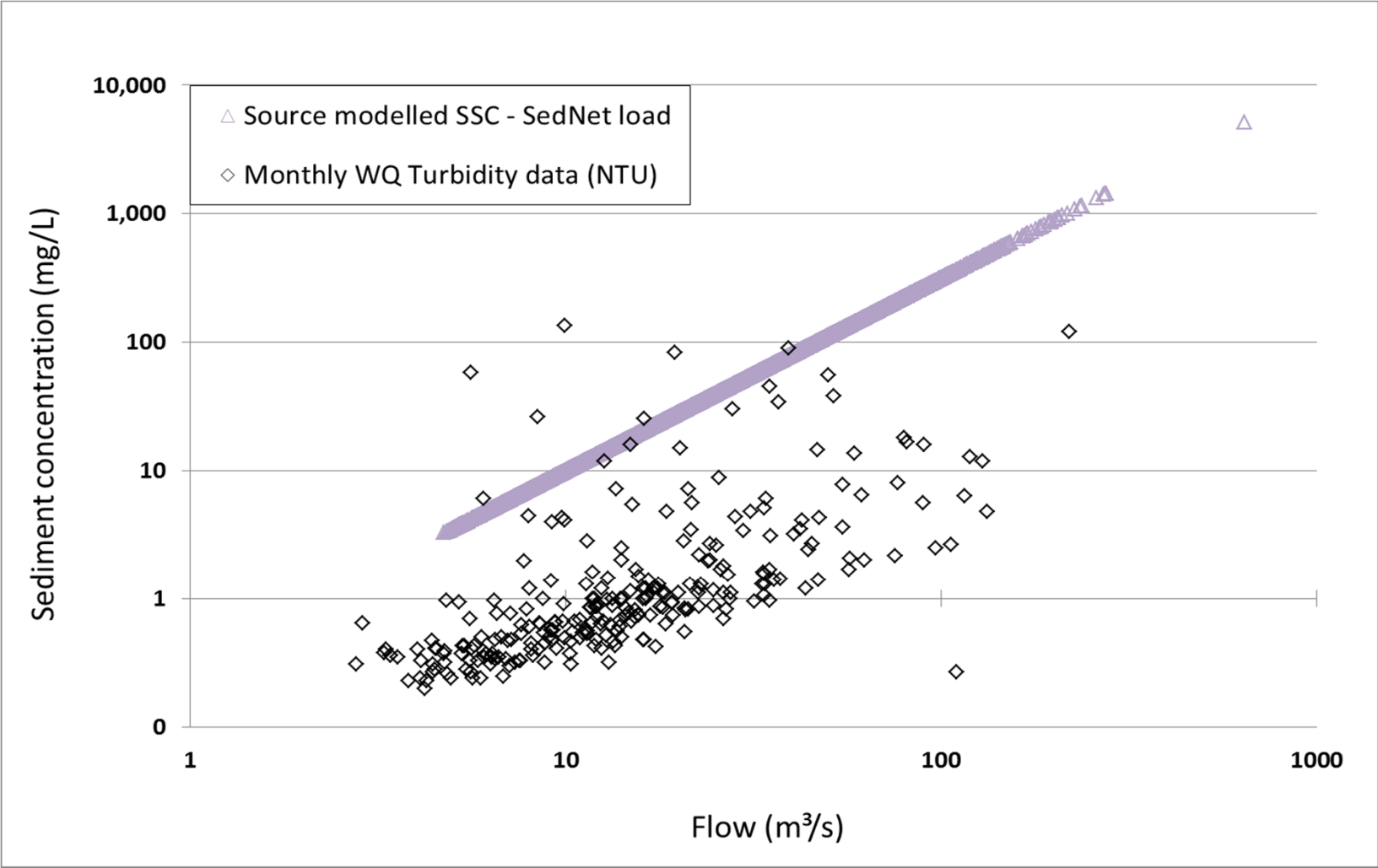
## Interim assumptions

- The SedNetNZ model is preferred as the estimate of baseline sediment load because it will enable sediment scenarios to be modelled spatially, the average annual sediment load predicted by SedNetNZ is larger than SSYE overall, but in most locations is very similar.
- A power curve relationship is an appropriate method to distribute sediment load in daily flows.
- The sediment load data in SSYE and SedNetNZ uses geology and rainfall to predict load. These loads seem high when compared to the monthly measured data, but there is better agreement for those sites where high flow sediment concentration data exists.
- Calibration is on-going.

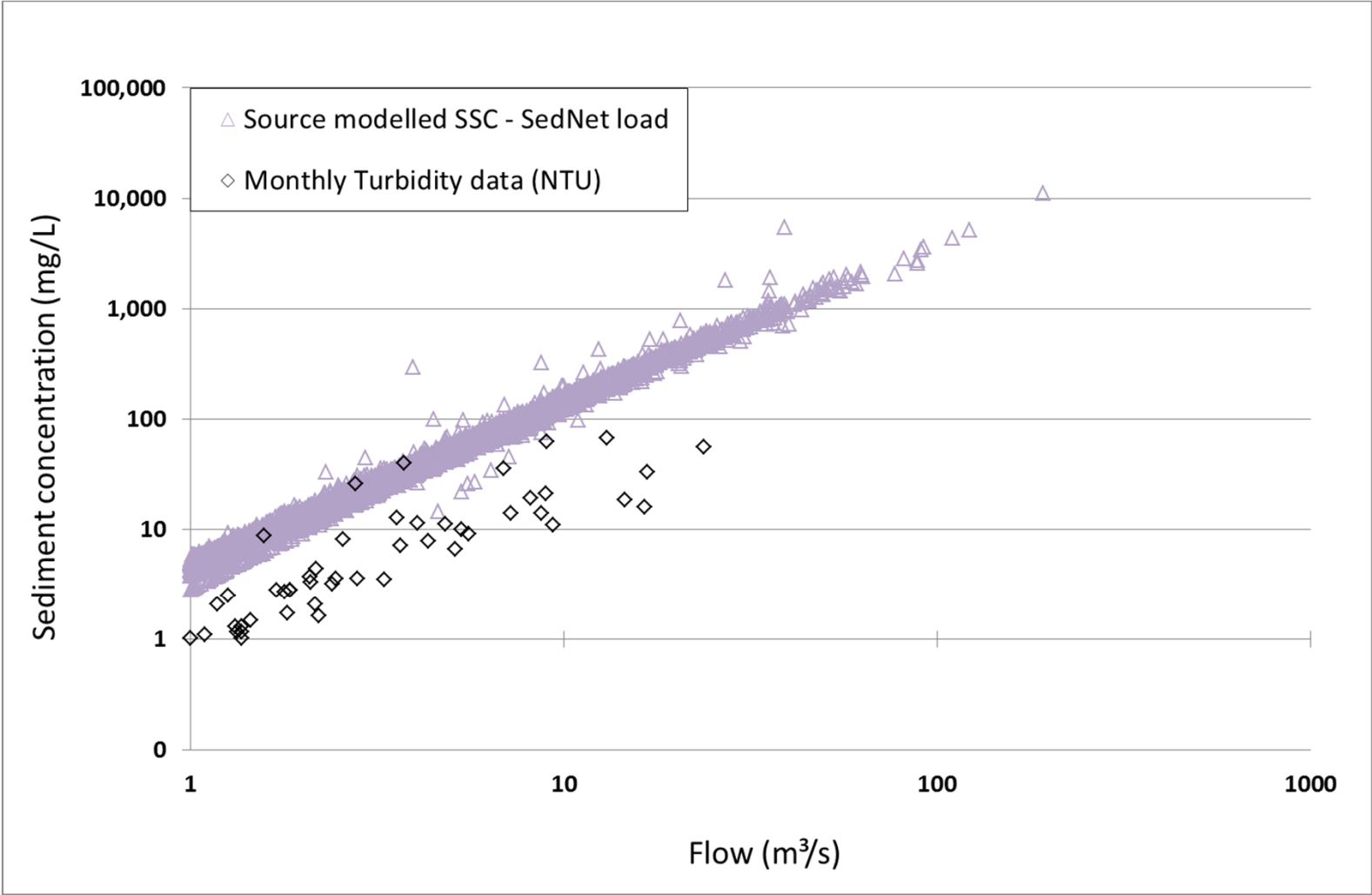
# Interim results - Ruamahanga at Waihenga



# Interim results - Waiohine at Gorge



# Interim results - Kopuaranga at Stuarts



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