

# Nutrient Discharge from the Motueka Catchment into Tasman Bay

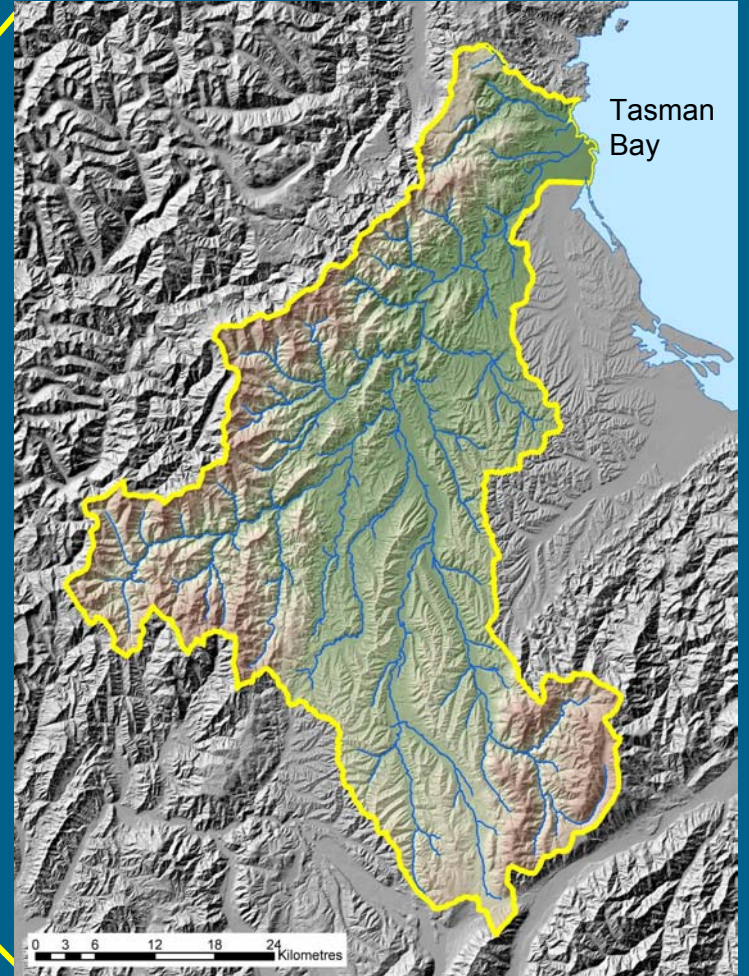
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Nelson New Zealand



# INTEGRATED CATCHMENT MANAGEMENT

for the *Motueka River*



Manaaki Whenua  
Landcare Research

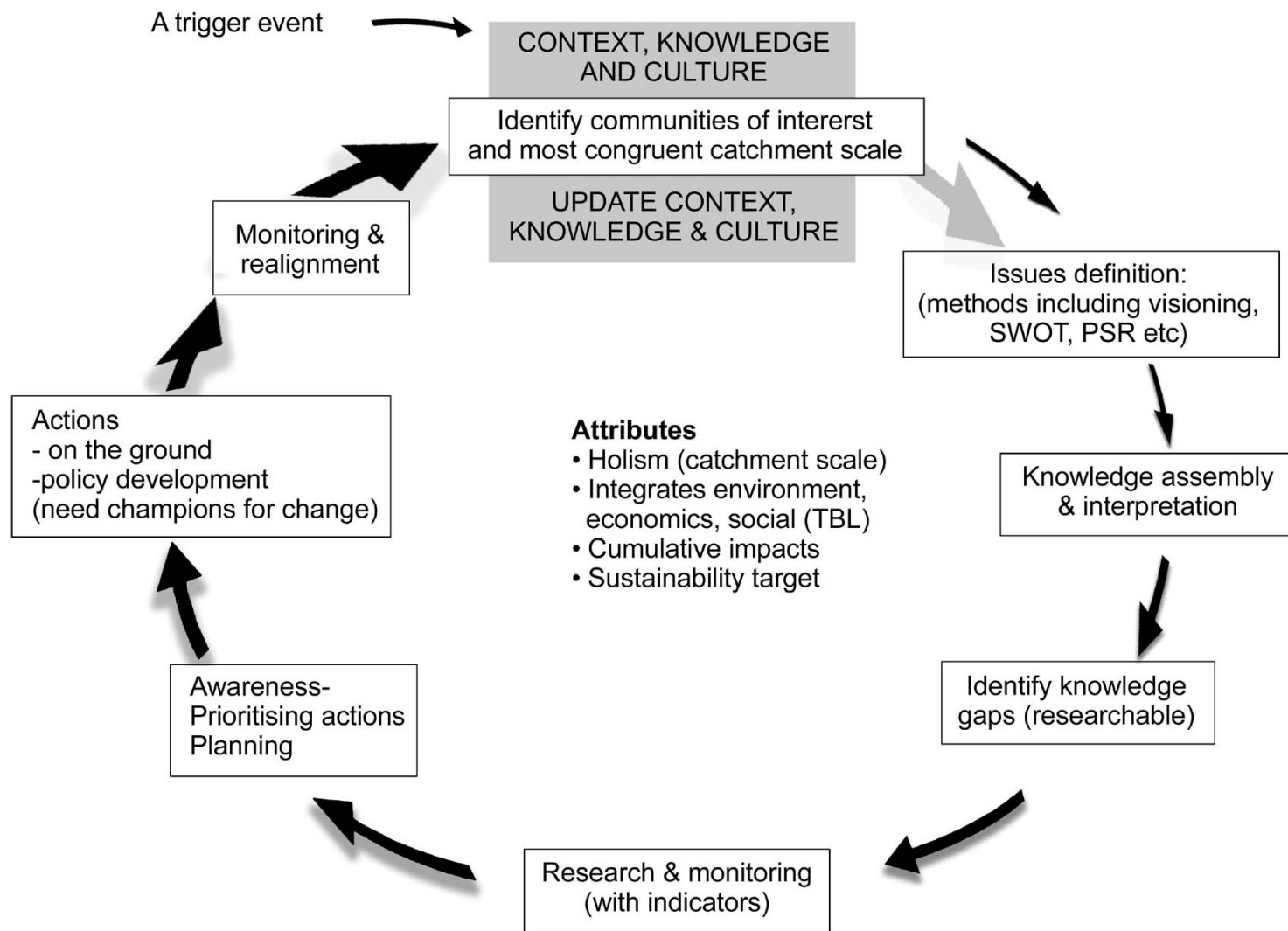


<http://icm.landcareresearch.co.nz>

# ICM – A Partnership



# ICM – A Process



# Integrated Research for ICM

- o Integration – what is it?
  - Community, policy, science
  - Scientific disciplines
  - Spatial integration
  
- o The role of science in ICM
  - Information/knowledge
  - Independent, non-threatening
  - Catalyst for bringing people together

# Complex Issues.....

.....require an integrated approach

Single discipline ----- specific issue

Multidisciplinary ----- bring together knowledge

↓  
Transdisciplinary ----- dissolving the boundaries



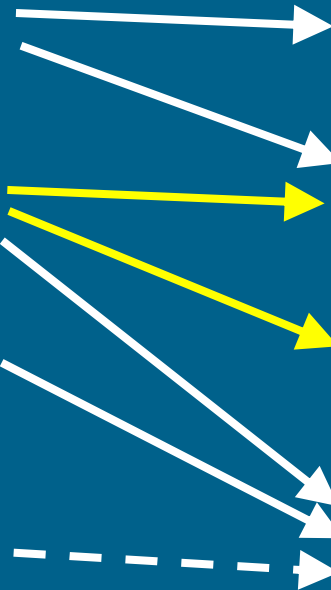
# Land-sea connections

## Catchment influences

- Fresh water
- Organic & inorganic nutrients (C, N, P, Si)
- Inorganic sediments
- Contaminants (microbes, organic & inorganic chemicals)

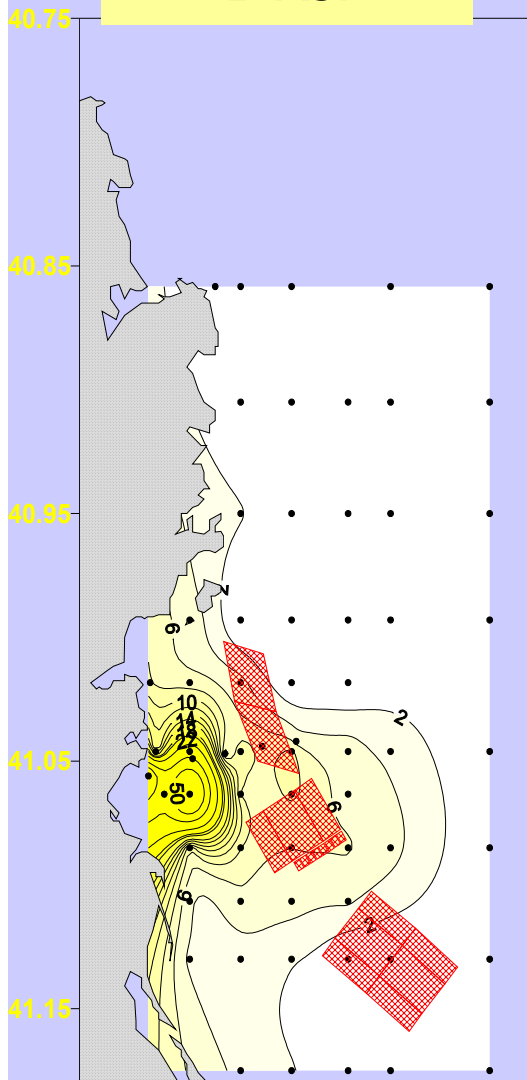
## Ecosystem features affected

- Water column structure (density stratification)
- Plant production
- Microbial processes (denitrification)
- Seabed habitat structure & composition (animal production, food web interactions, biodiversity, introduced species )



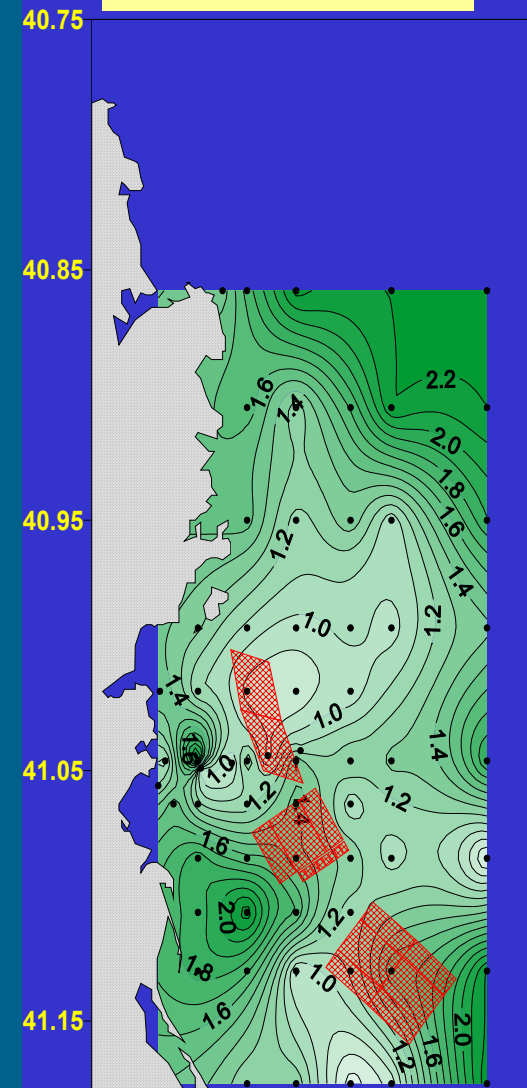
# Land-sea connections

DRSi



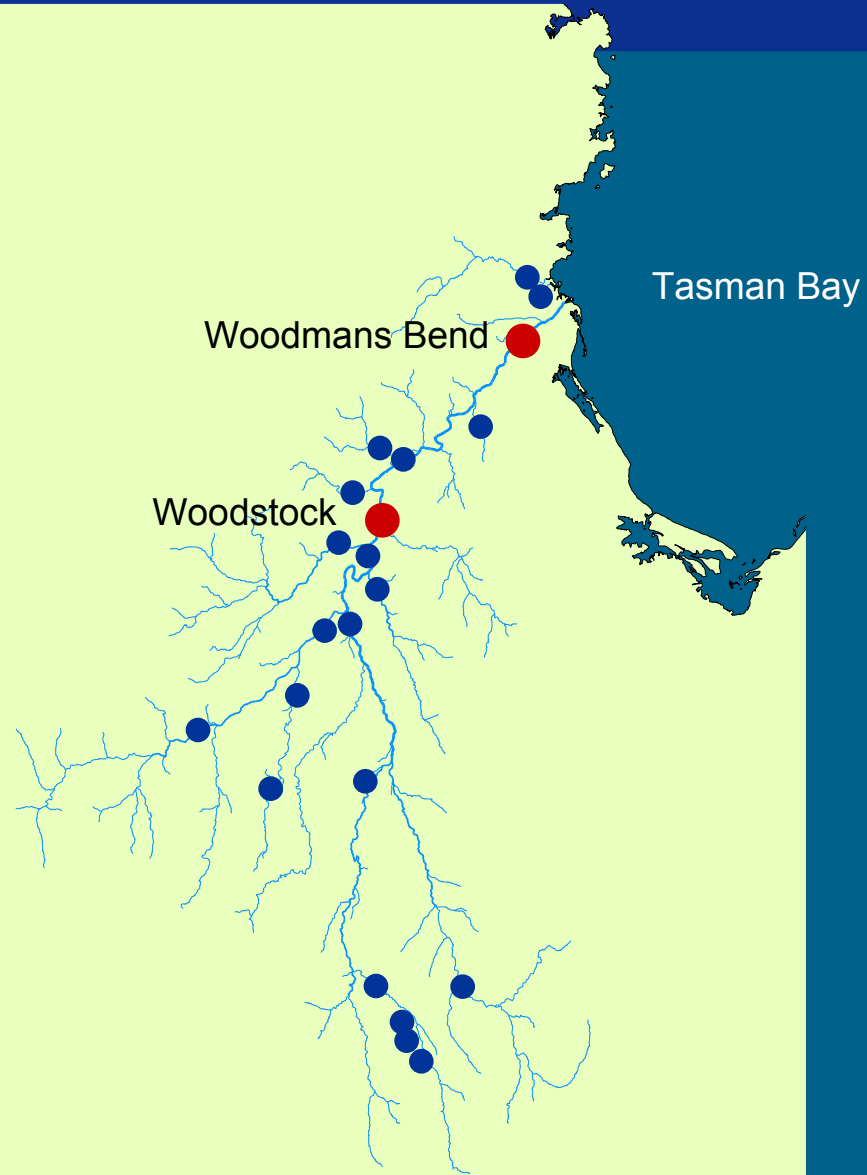
Periodic development of east to west gradients of nutrients and chlorophyll *a*

Chl *a*



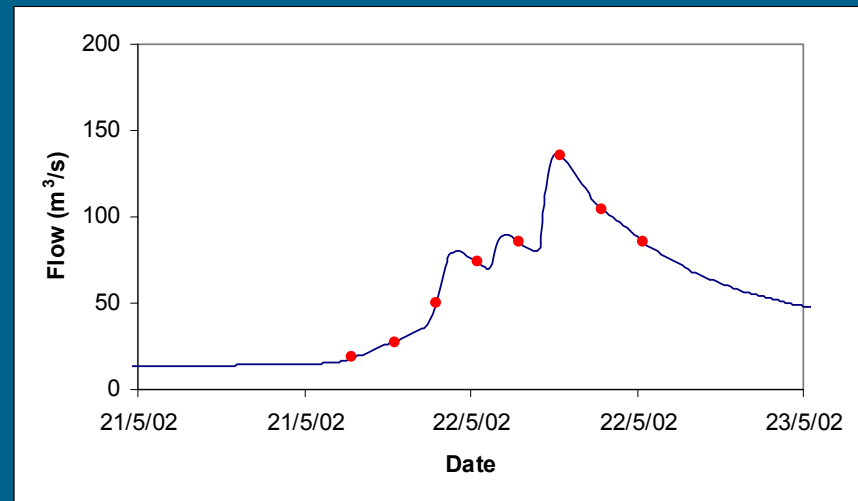
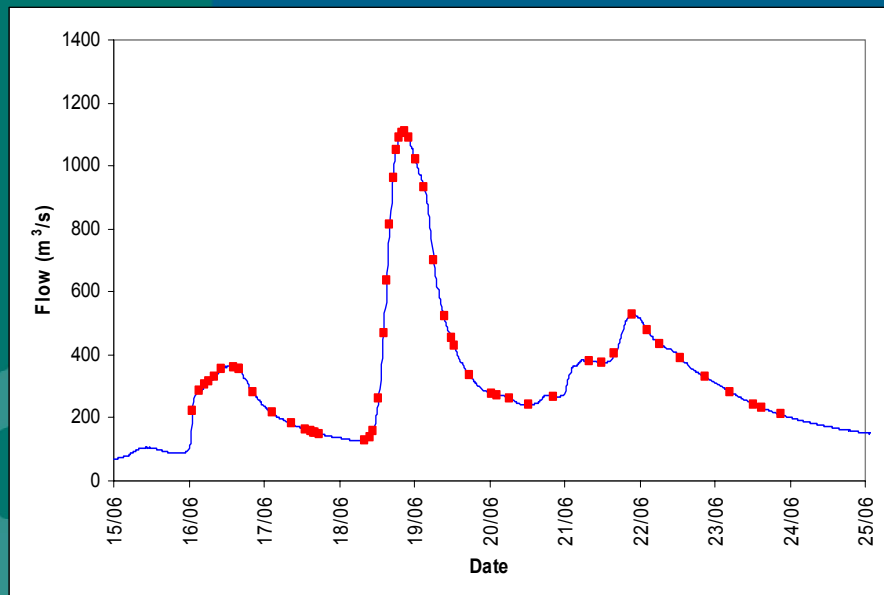


# Water Quality Monitoring Sites

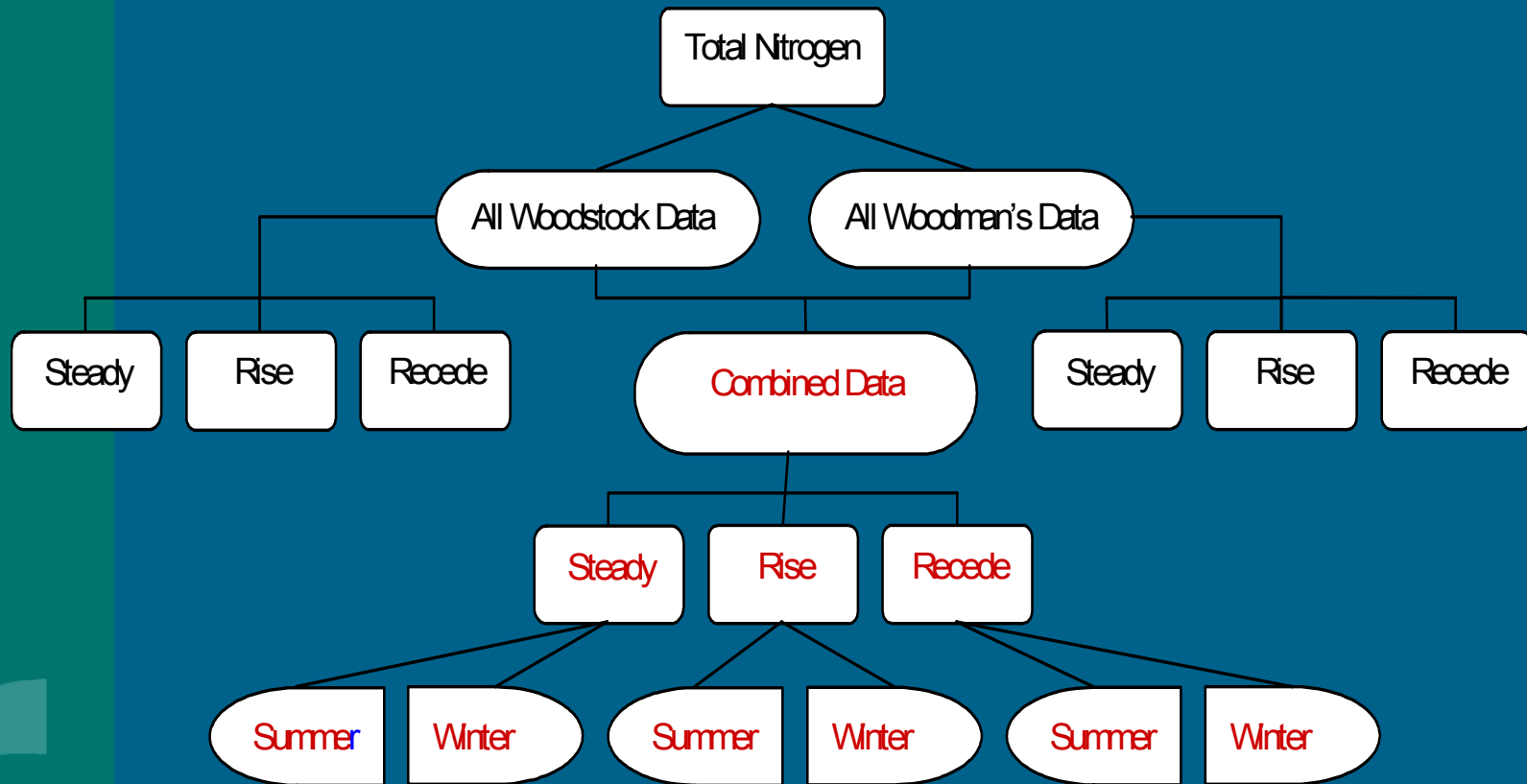


# The Data

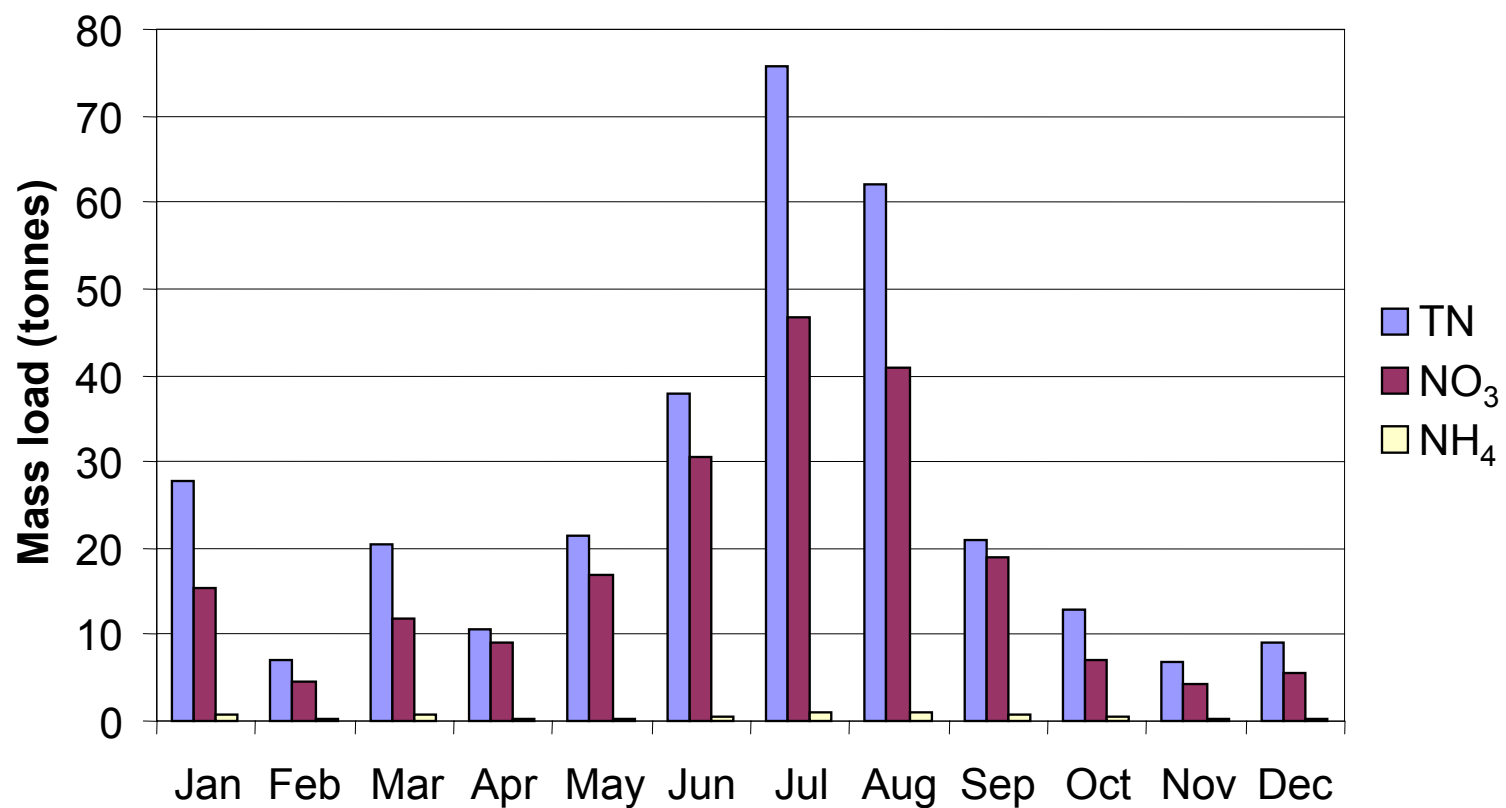
- o Load = Flow x Concentration
- o Flow/concentration relationships developed from:
  - Historical records Woodstock (1989-2004) – (NIWA)
  - On-going water quality measurements - (Cawthron/TDC)
  - Detailed sampling of 2 flood events (1-large & 1-small)



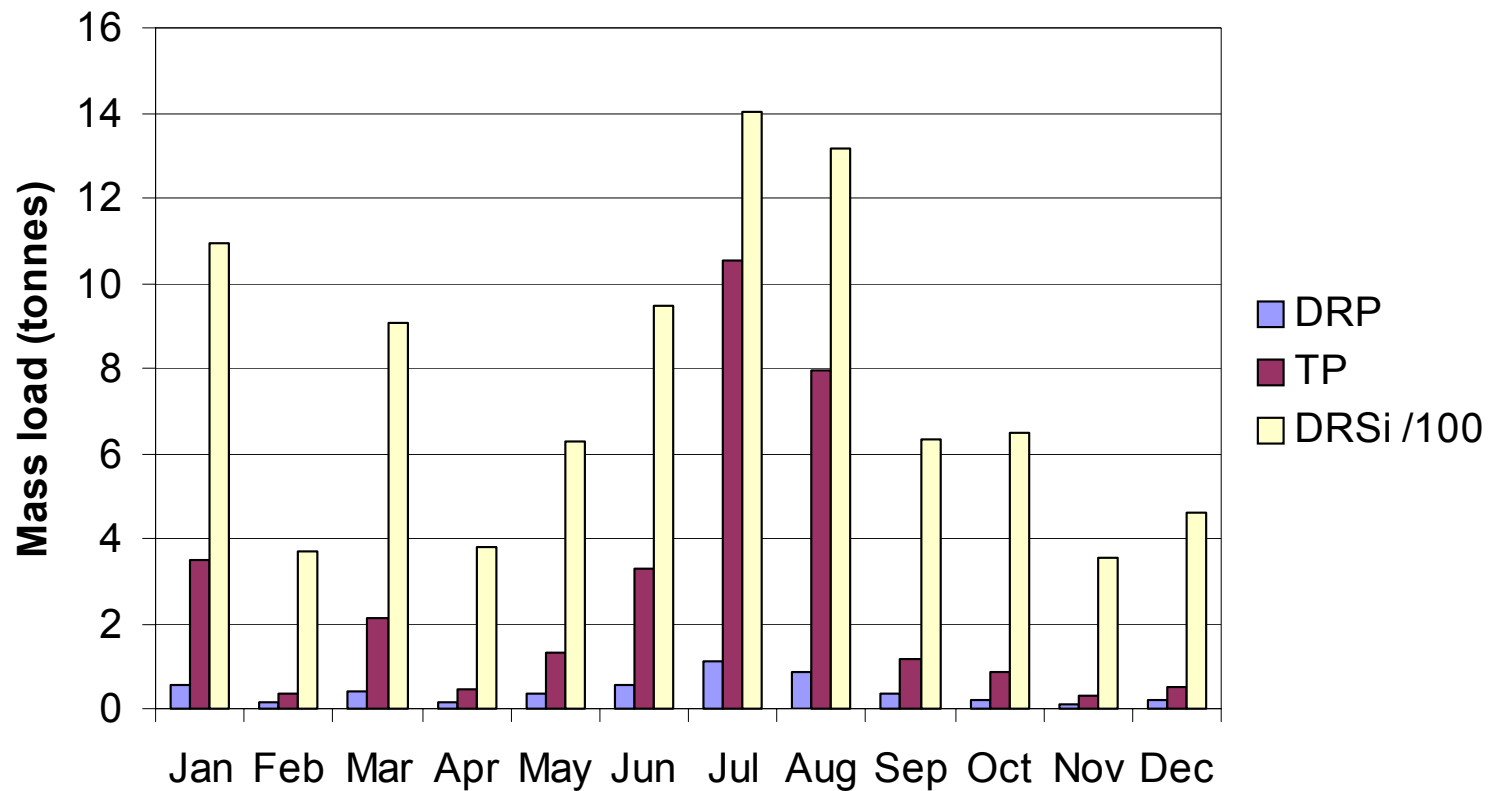
# The Data



# Monthly Loading



# Monthly Loading



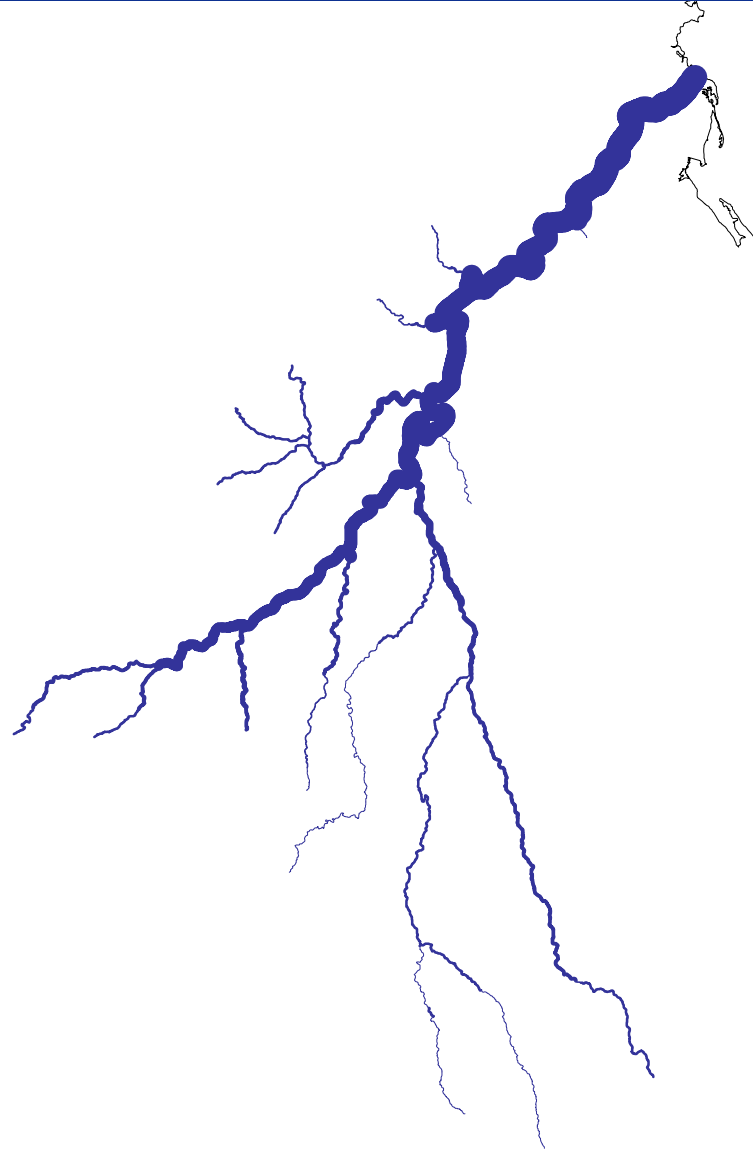
# Nutrient Loading to Tasman Bay

## o Tonnes during 2005

TN	NO <sub>3</sub> -N	NH <sub>4</sub> -N	DRP	TP	DRSi
313	212	7	5	32	9132

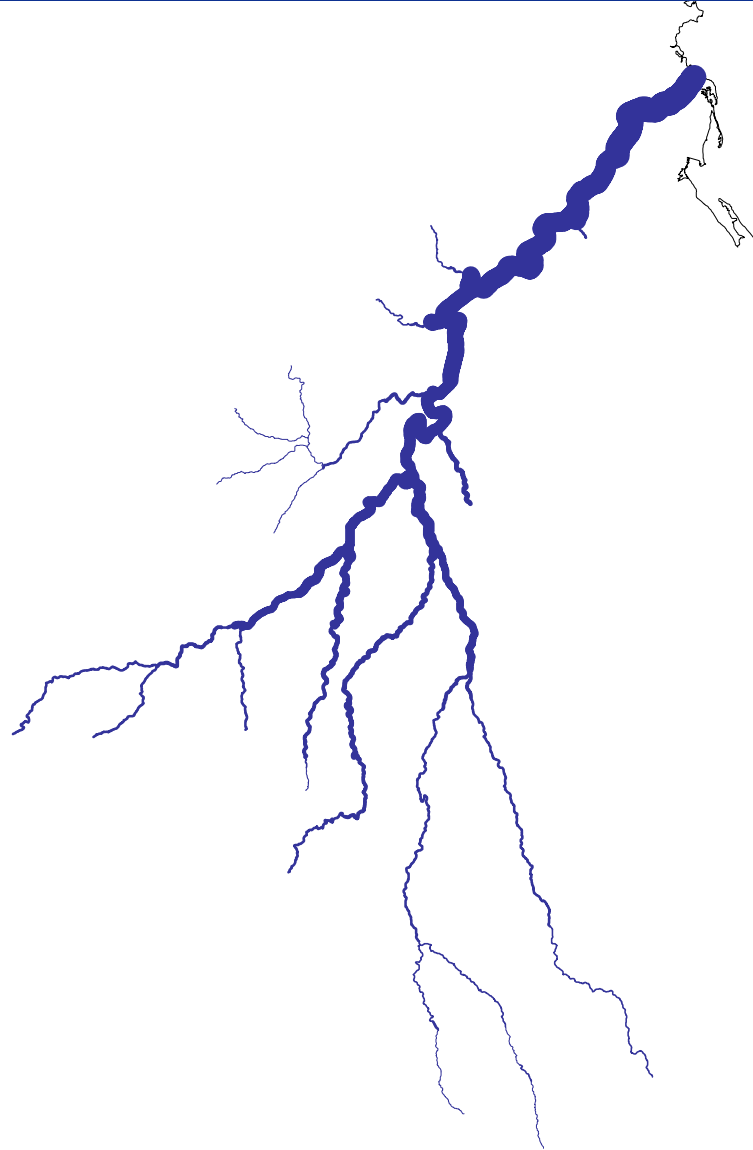


# Where does it come from?



Flow  
( $\text{m}^3/\text{s}$ )

# Where does it come from?



TN  
(kg/day)

## What effect is it having in Tasman Bay?

- Motueka TN discharge (2005) = **~313 t**
- Total freshwater TN discharge (including point source discharges) = **~900 t/ year**
- N loss via denitrification = **~1800 t/year**
- Freshwater N Inputs ~50% of Denitrification losses
- Problems associated with eutrophication unlikely
- Nutrients having beneficial effects on productivity

# Summary

- o Benefits of integration
  - Among different disciplines
  - Spatially
  - Policy implications
- o Results applicable in other areas
  - Aorere/Golden Bay