



**For now &
our future**

Periphyton – improving our understanding of Southern slime

Roger Hodson *Environmental scientist - surface water quality*

Acknowledgements

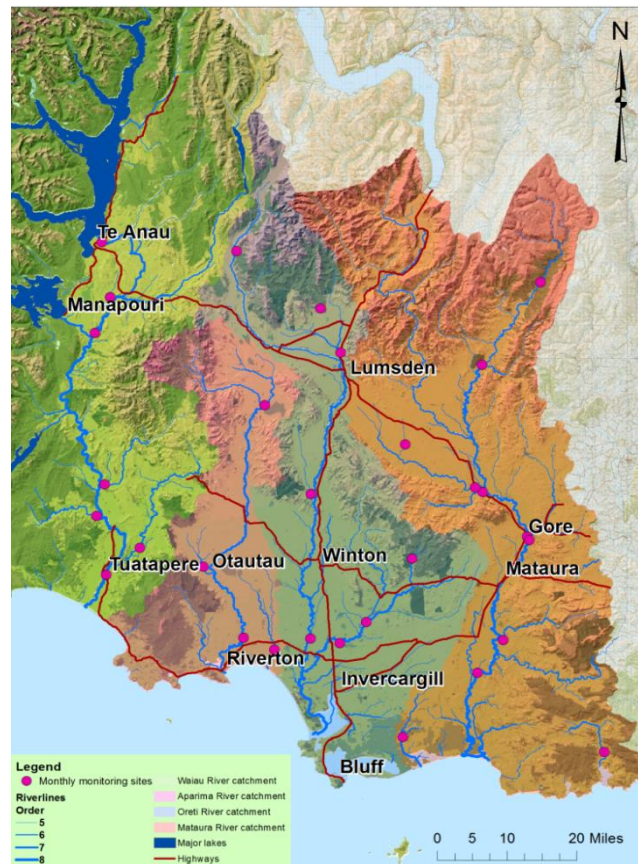
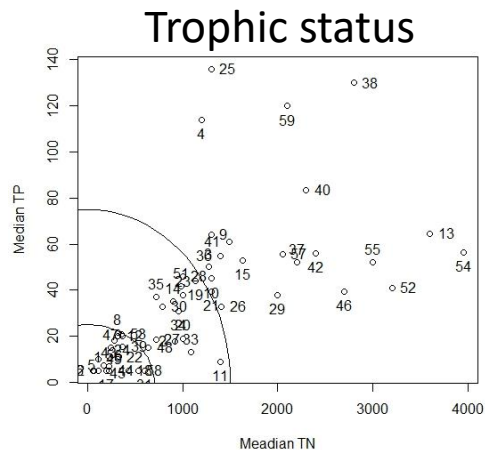
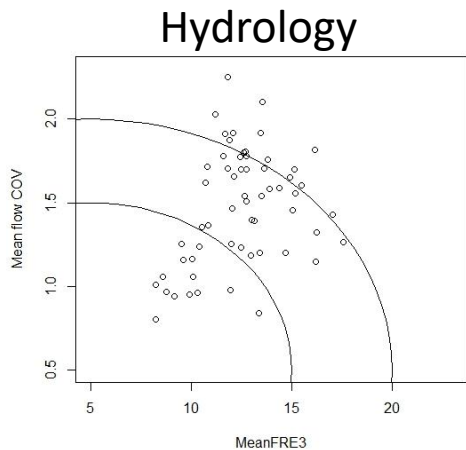
- Environmental Data Field Team (ES)
 - Mitchell Harvey
 - Nathan Hughes
 - Grace Smith
 - Callum Chisnall
- Cathy Kilroy (NIWA)
- Ton Snelder (Land Water People)
- Nuwan DeSilva
- Abbas Akbaripasand

Background

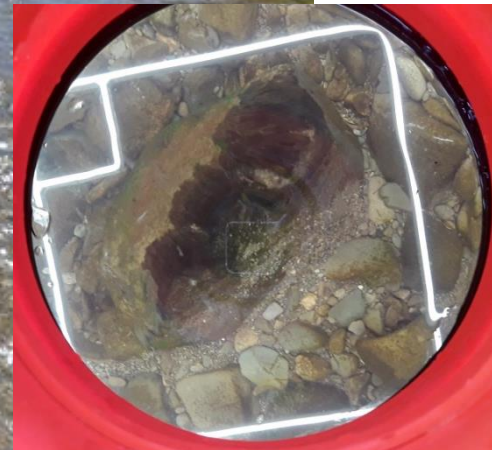
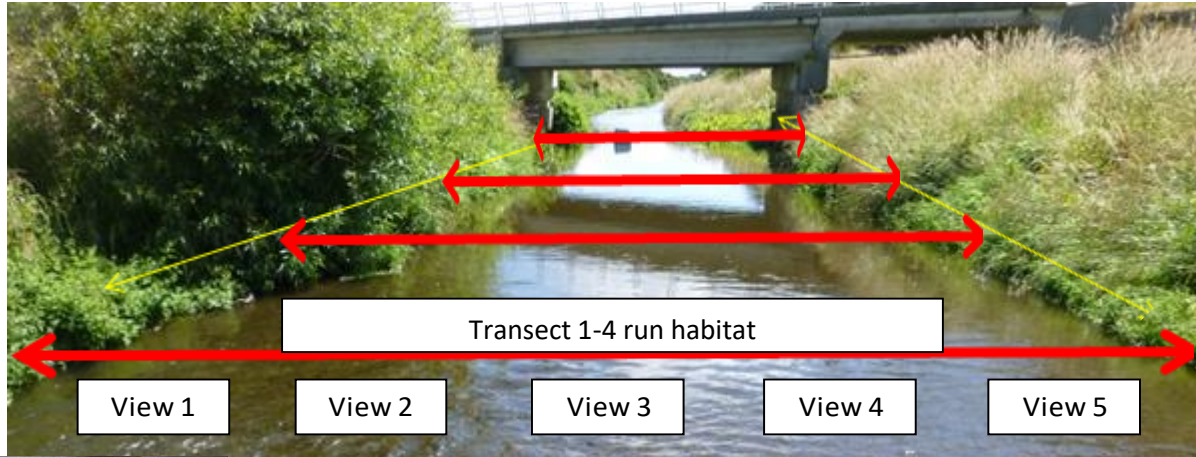
- What is state of periphyton in Southland?
- Previous annual frequency monitoring
- New monthly programme initiated
- Three years data collection – assess state

New monitoring programme

- 30 sites
- Co-located with water quality
- Flow record
- Important main stem locations
- Unshaded run habitat

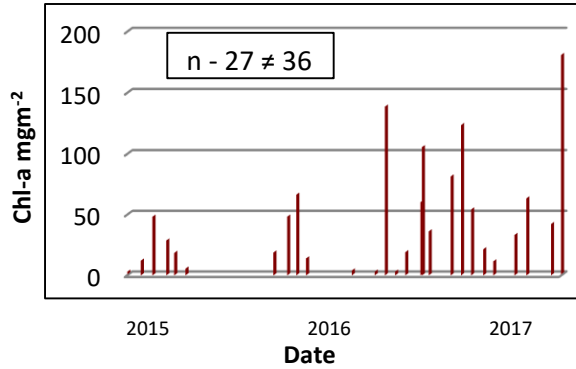


New monitoring programme



Assessing periphyton state

Otautau Stream at Otautau Tuatapere Highway



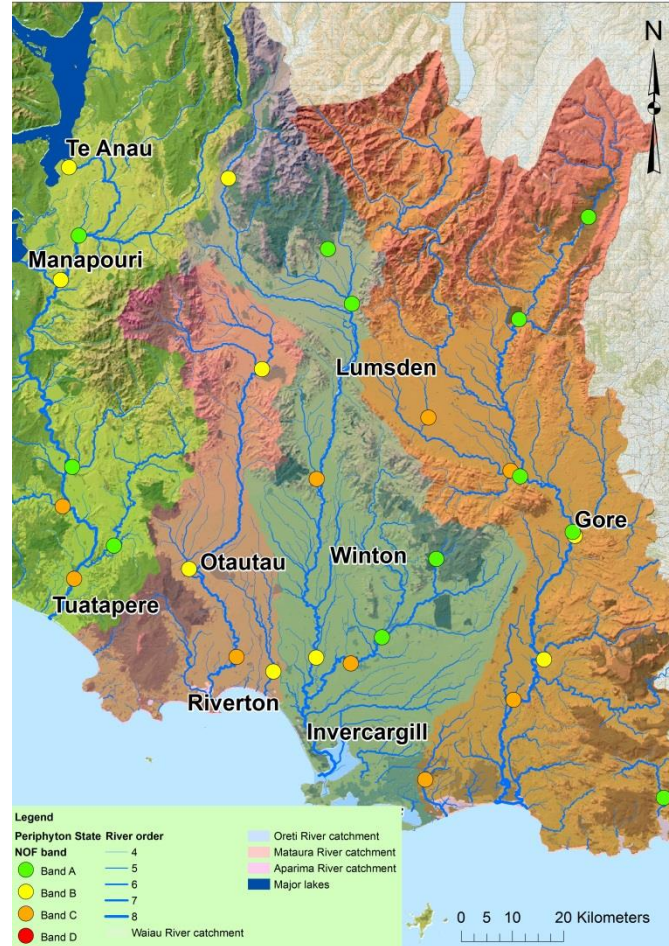
Three year data but missing values

Calculate site mean chl-a

Estimate 92nd percentile

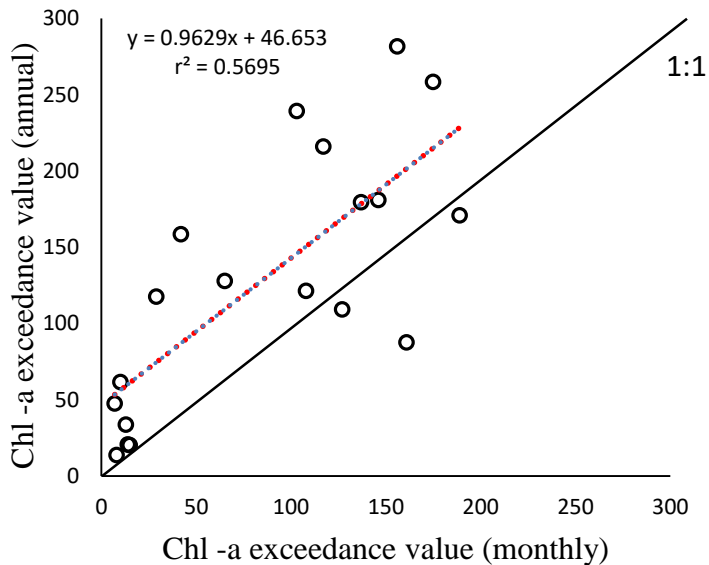
$$Chl - a = - \ln (Pr) \times \mu$$

$Pr = 0.083 (1/12)$



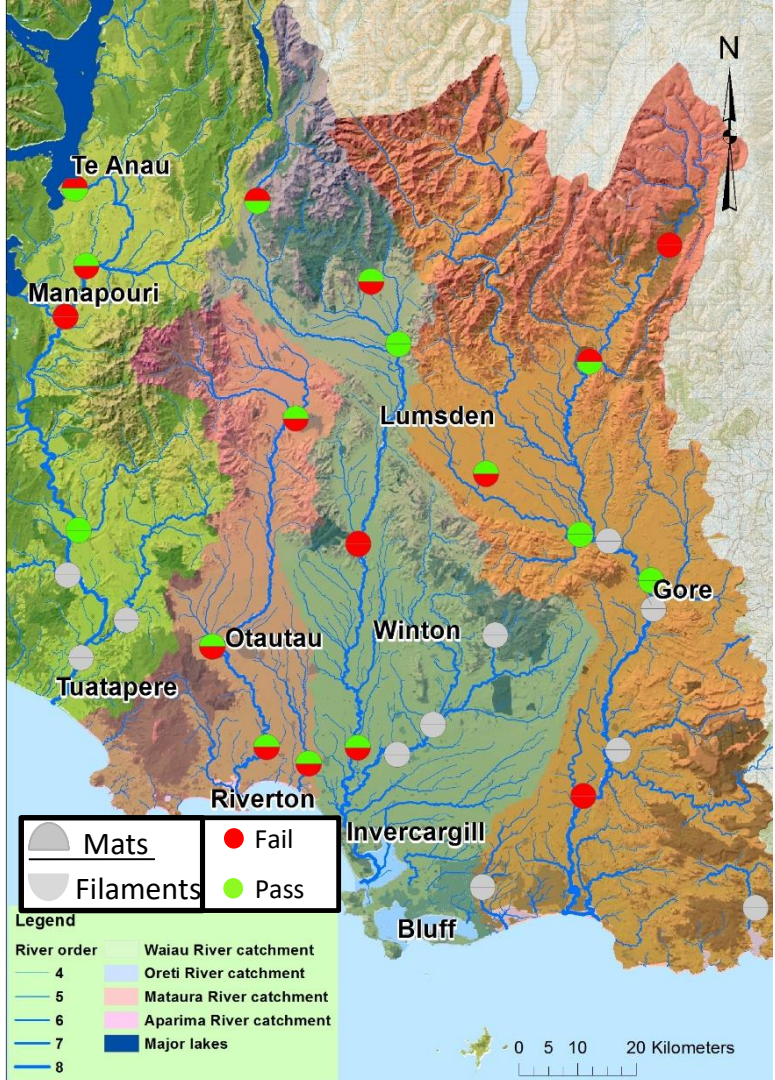
State	% of sites (n)
A	40% (12)
B	27% (8)
C	33% (10)
D	0*

Annual vs monthly frequency assessment



Attribute	Band			
	A	B	C	D
Chl - a (mg m ²)	< 50	50-120	120-200	> 200
Percentage/number of streams & rivers (Annual)	30% (22)	26% (19)	32% (24)	12% (9)
Percentage/number of streams & rivers (Monthly)	40% (12)	27% (8)	33% (10)	0

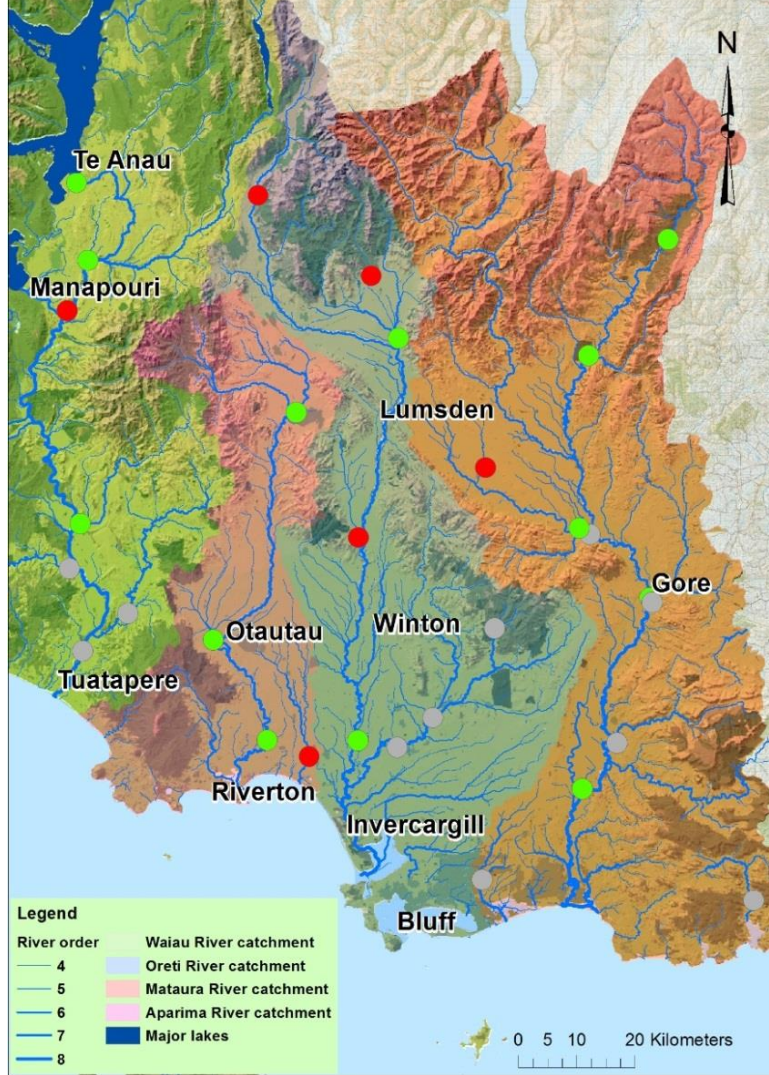
Chl-a ~1.6 times higher
Annual > monthly



Thick mats – 37 % fail

Filaments – 63 % fail

Overall – 79% fail



Ash Free Dry Weight – 32 % fail

Conclusions

- Monthly monitoring required by NPSFM – started Dec 2014
- 30 sites across hydraulic and nutrient gradients
- All 30 sites in A-C band of NOF * 7 with upper 95%CI in D
- 32% fail to meet regional AFDW
- 37% fail thick mats and 63% fail long filaments
- Next step to develop nutrient criteria

Data worth

- Monitoring frequency matters
- Monthly periphyton assessment has improved understanding of Southern slime
- Periphyton benthic chl-a state “better” than initial assessment from annual frequency data