Faecal microbial pollution of waters

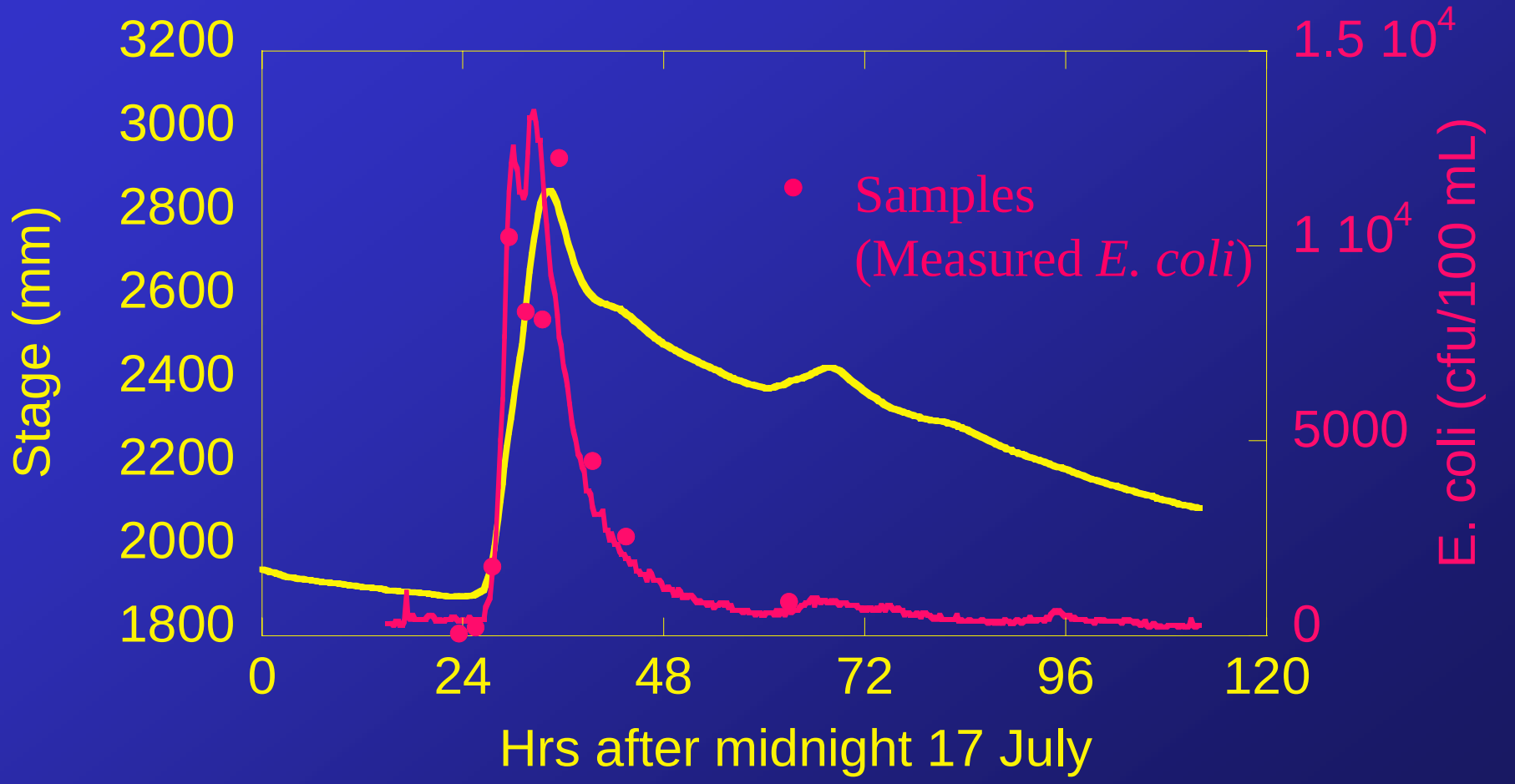
Land sources; microbes in streams and sediments; flood flushing to coastal waters

Rob Davies-Colley

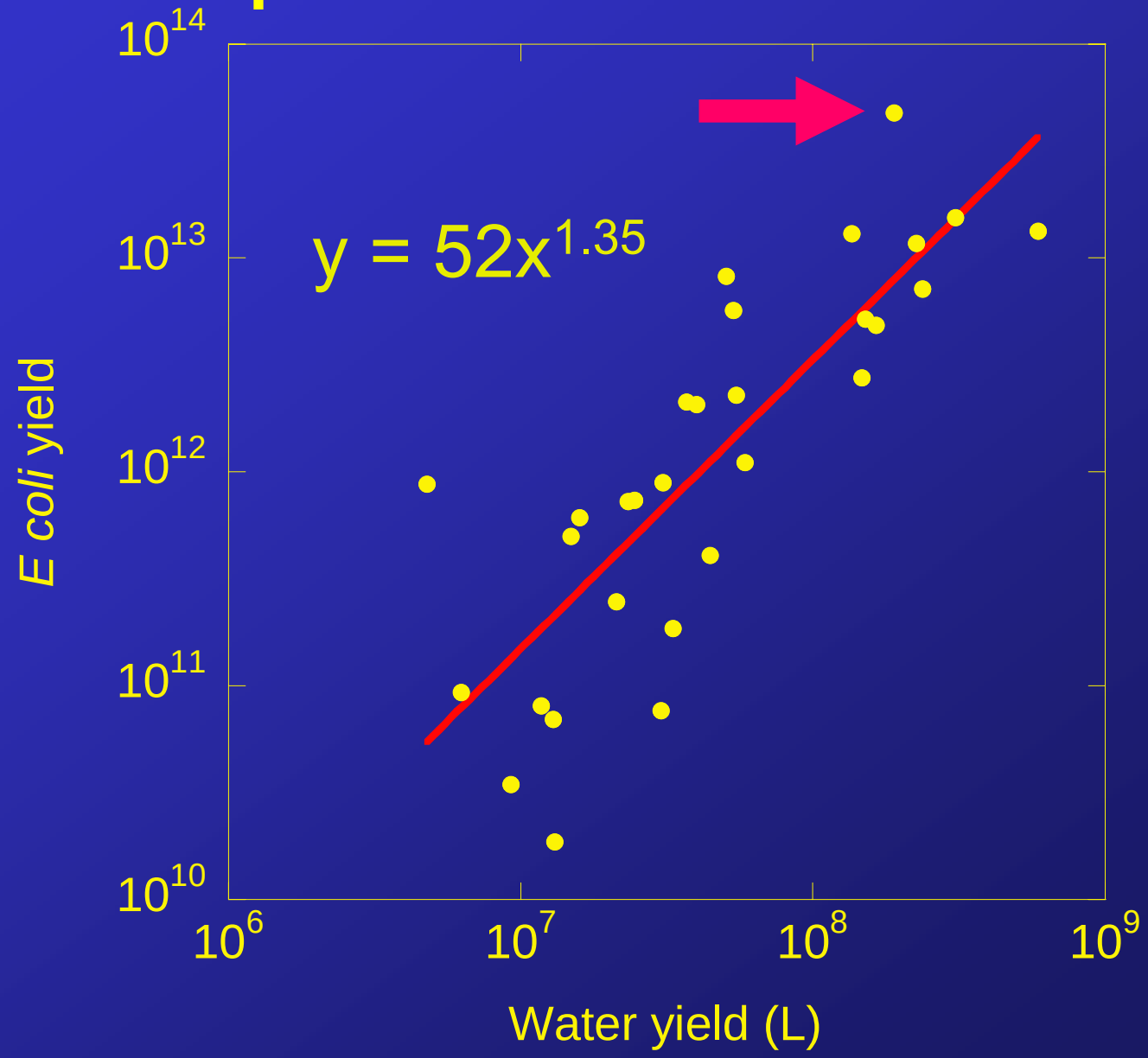
(NIWA, Hamilton)

(with acknowledgements to numerous colleagues in NIWA, ESR, AgRes, LCR,…)

Toenepi – storm of 18 July



Toenepi – 30 storm events

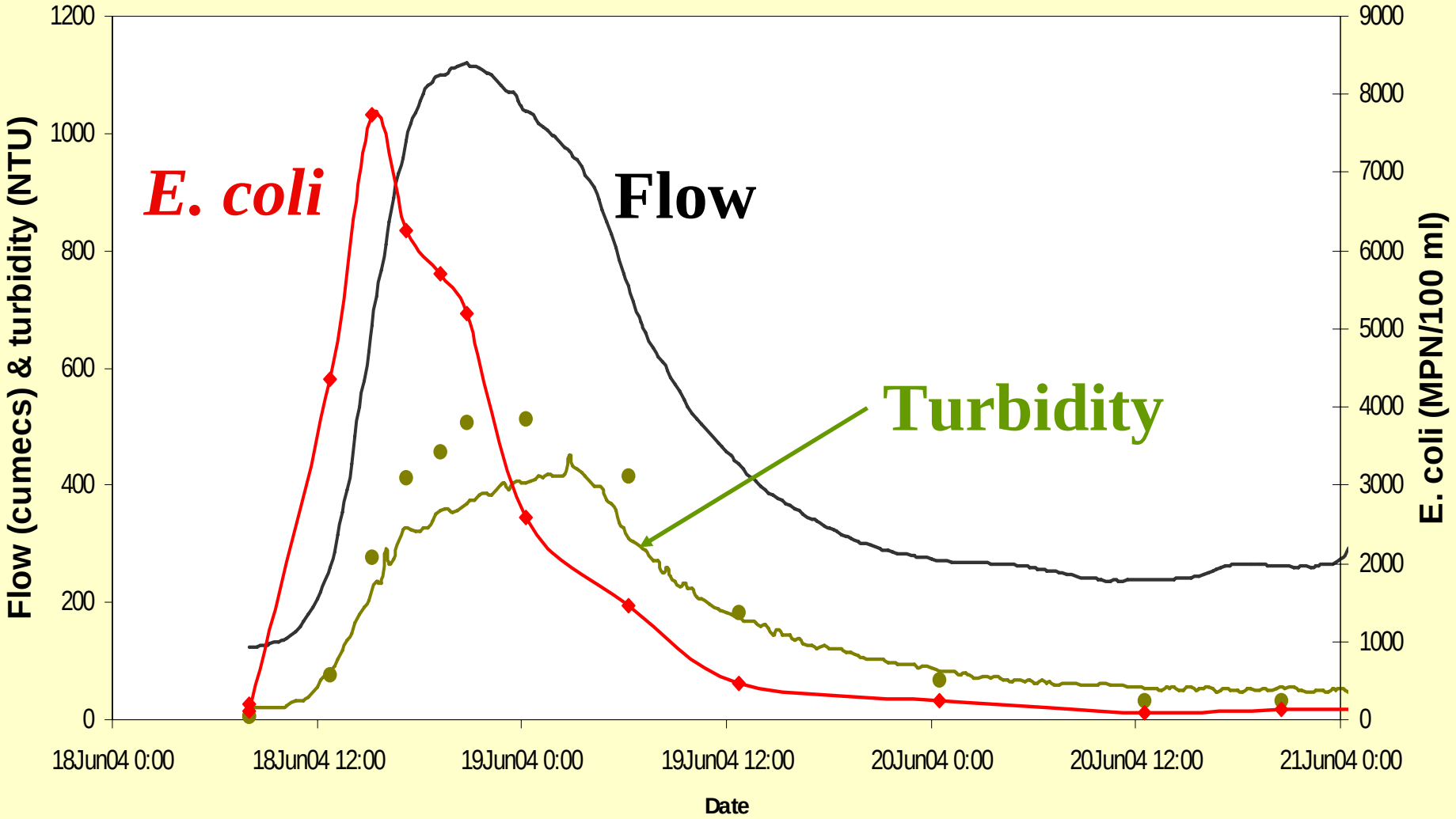


Toenepi – annual yields

	Yield	**%**
Flood events	1.5 X 10^{14} cfu	95%
Base Flow (76% of time)	8 X 10^{12} cfu	5%
Total	1.6 X 10^{14} cfu	100% *

* 6 % of production @ 1.3 x 10^{9} *E. coli*/cow/day

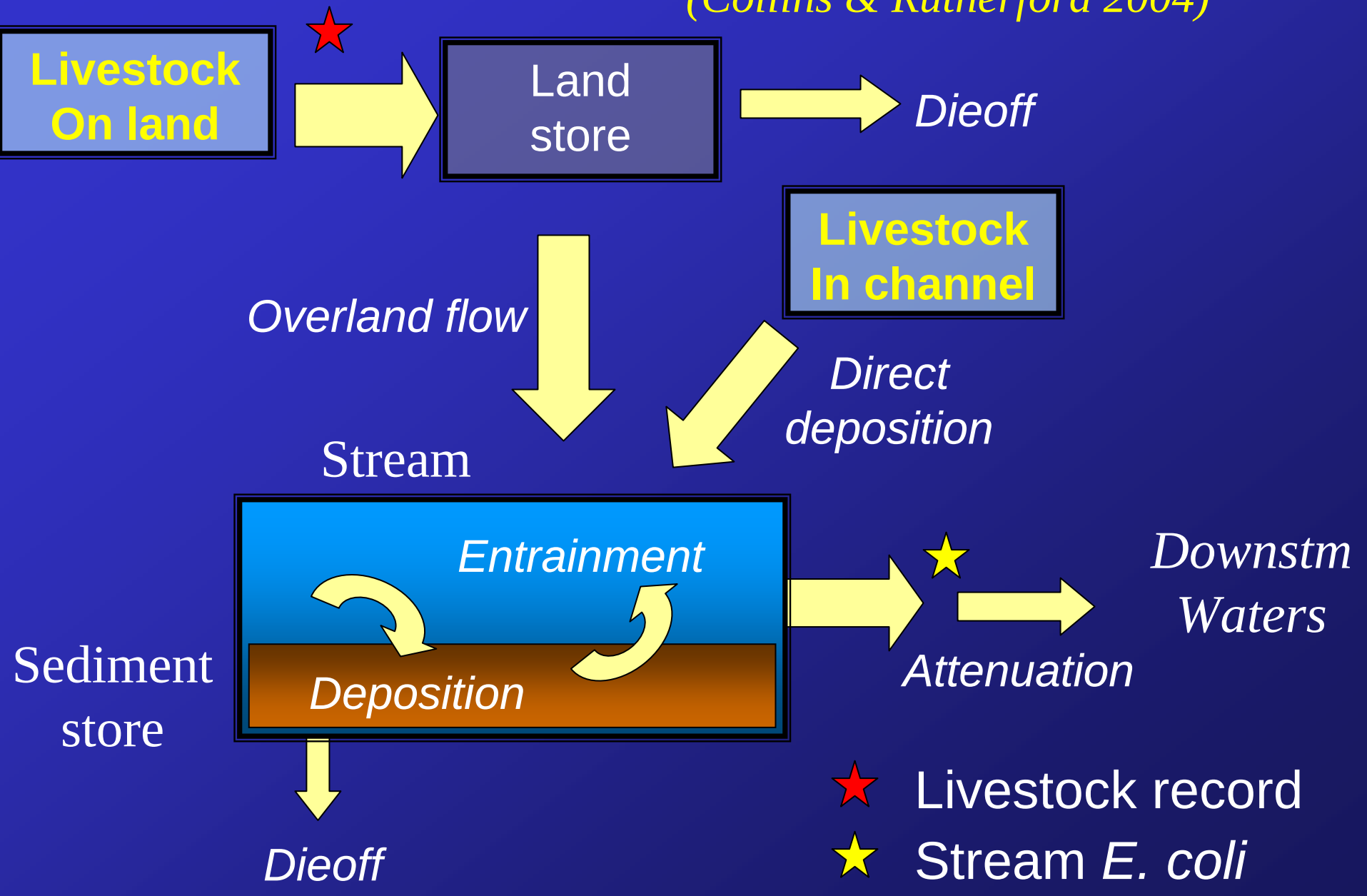
Motueka Woodman's Bend
18-21 June 2004



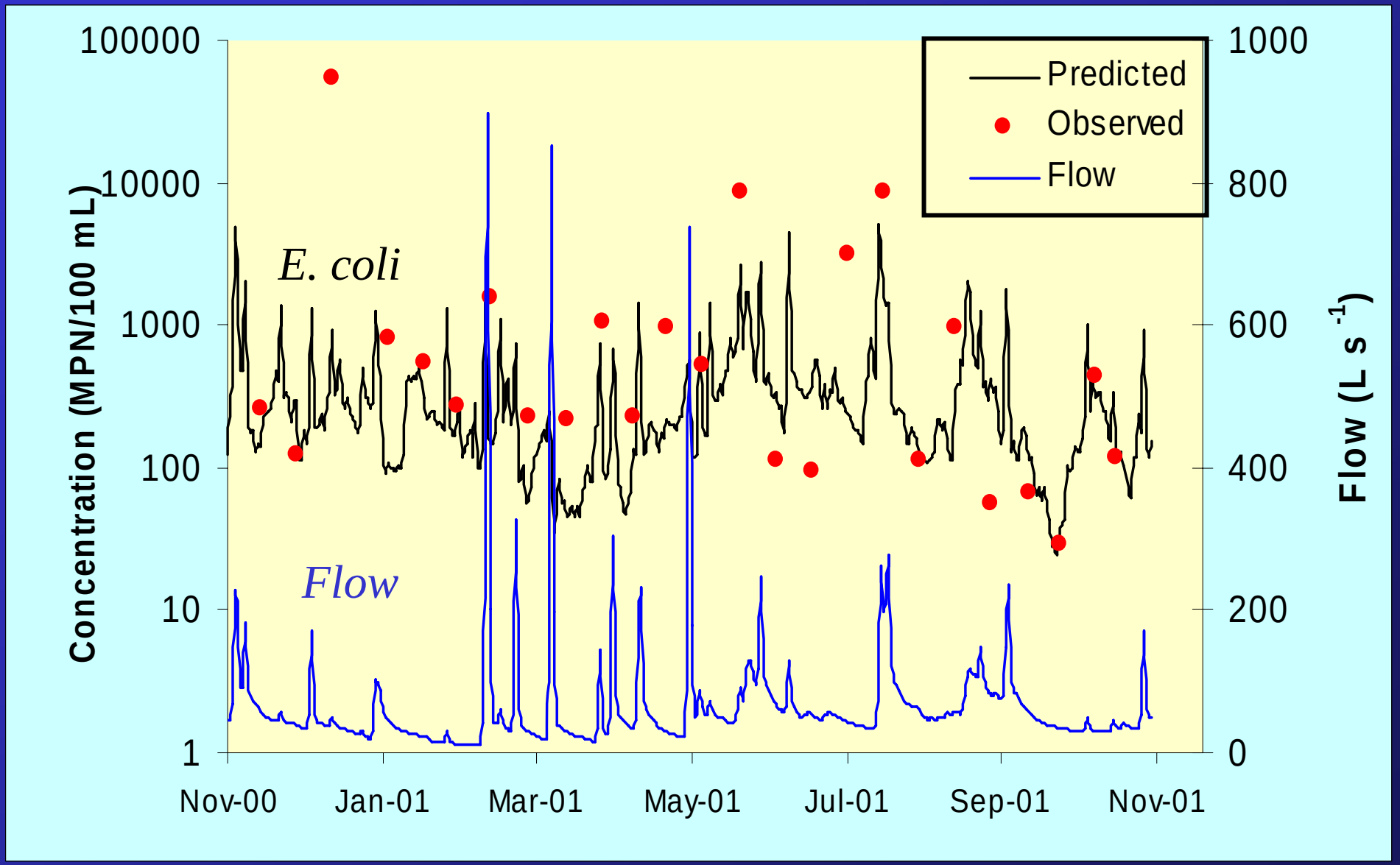
Pulling it all together – Part 3 Modelling

Model Structure

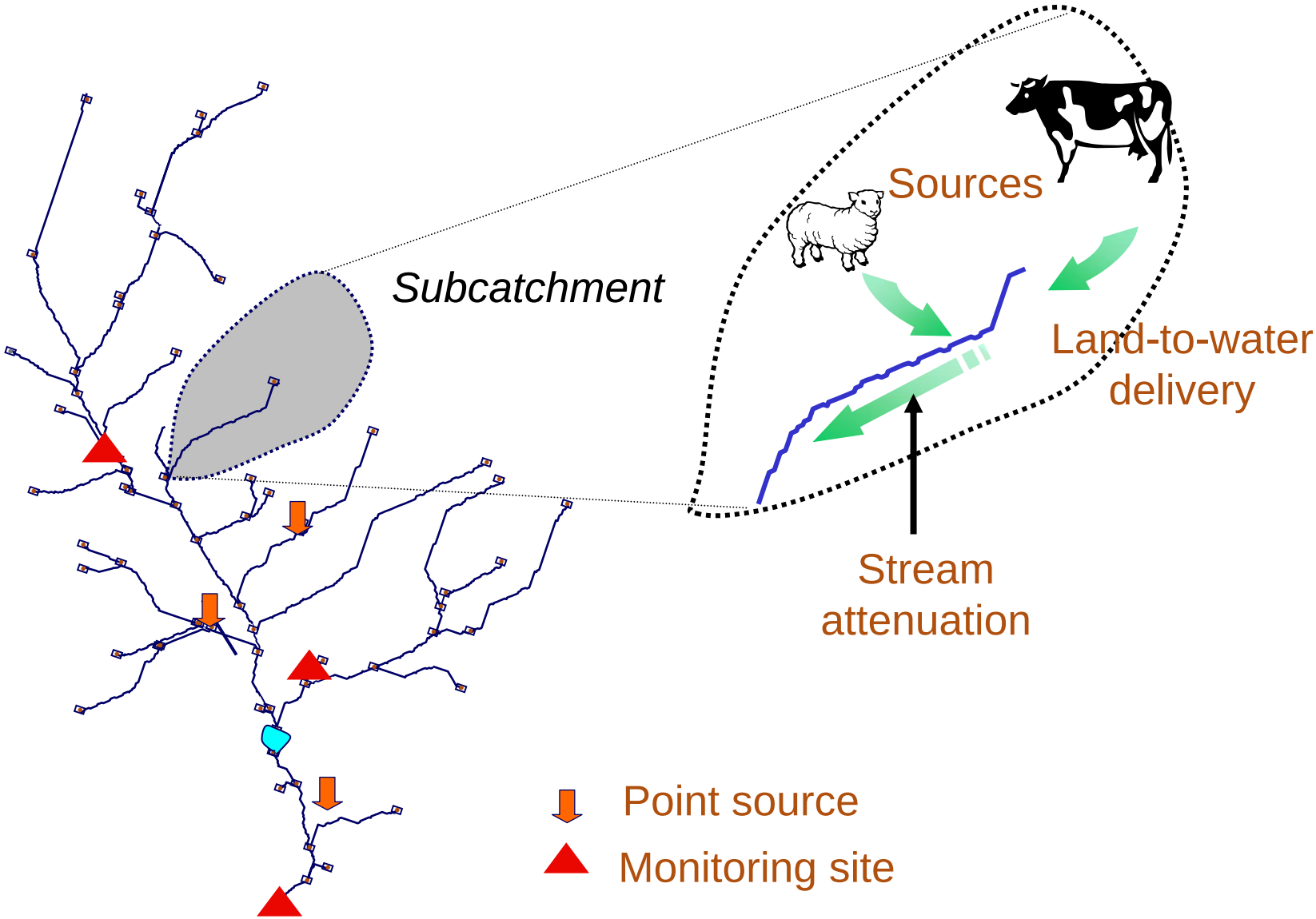
(Collins & Rutherford 2004)



E. Coli model - Whatawhata



SPARROW Modelling



Current research topics

- **Benefits of farm BMPs** (e.g., riparian mgemt, bridging, constr. wetlands; 'focus' catchments; Sherry R (Mot.ICM))
- **Sediment stores** (sediment sampling; uptake, entrainment and dieoff within sediments; flume expts.)
- **Faecal microbial yields**

  (Toenepi, also Motueka, Raglan)
- **Predicting shellfish contamination** (neural networks; shellfish bioaccumulation)
- **Modelling** (e.g., SPARROW)

Conclusions –

main take-home points

1. **Pathways** of faecal contamination: overland flow and direct deposition
2. **Sediments** : most stream contamination is in sediments – 1000X more than water
3. **Floods** dominate faecal contamination yields – and contamination of downstream waters
4. **Turbidity** is sometimes a useful surrogate for faecal contamination (but…)
5. **Modelling** – valuable contributions
6. **Current research**. On-farm BMPs, sediment contamination, faecal yields, shellfish contam.