INTEGRATED CATCHMENT MANAGEMENT for the Motueka River

•ridge tops to the sea•

Integrating groundwater modelling and river ecology for improved understanding

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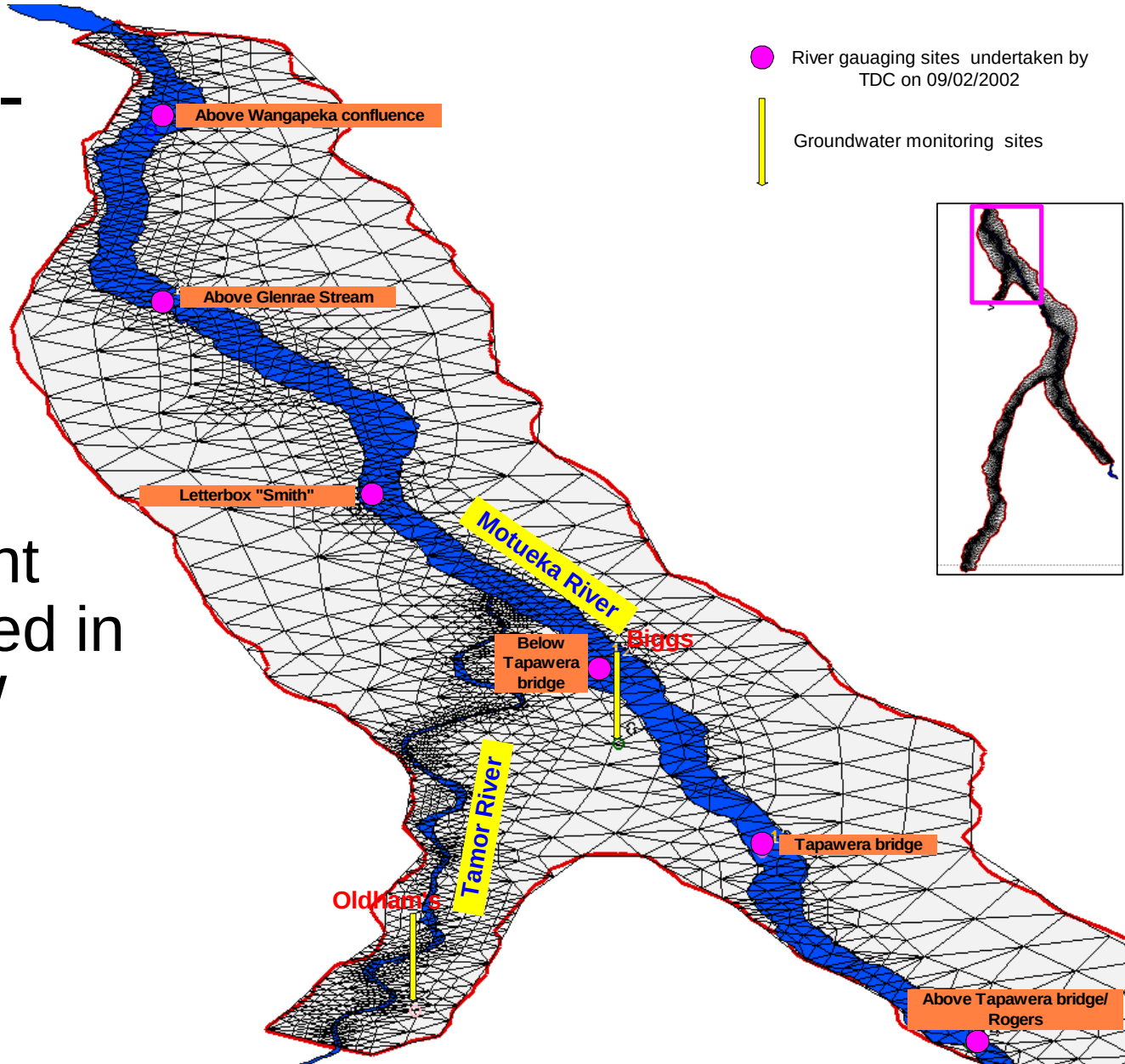
Background

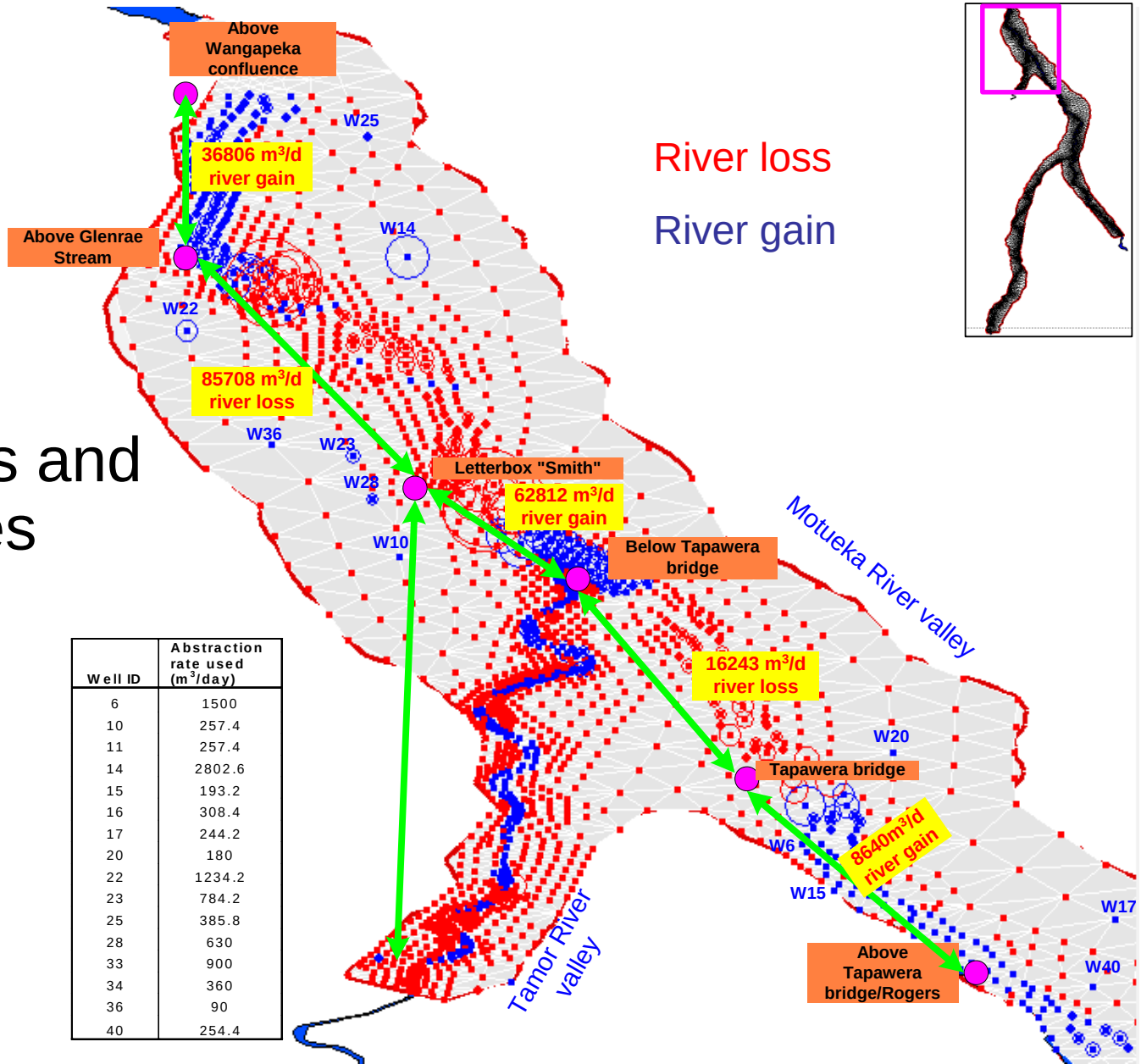
- Integration of science disciplines as part of Integrated Catchment Management
- Integration here between groundwater investigation and river ecology
- Upper Motueka (from Wangapeka confluence up) has large area of alluvial river terraces
- Water conservation order for Motueka places restrictions on water take
- Strong interaction between river and shallow groundwater

Groundwater-river modelling

- 3d finite element model developed in using FEFLOW
- Currently only steady-state

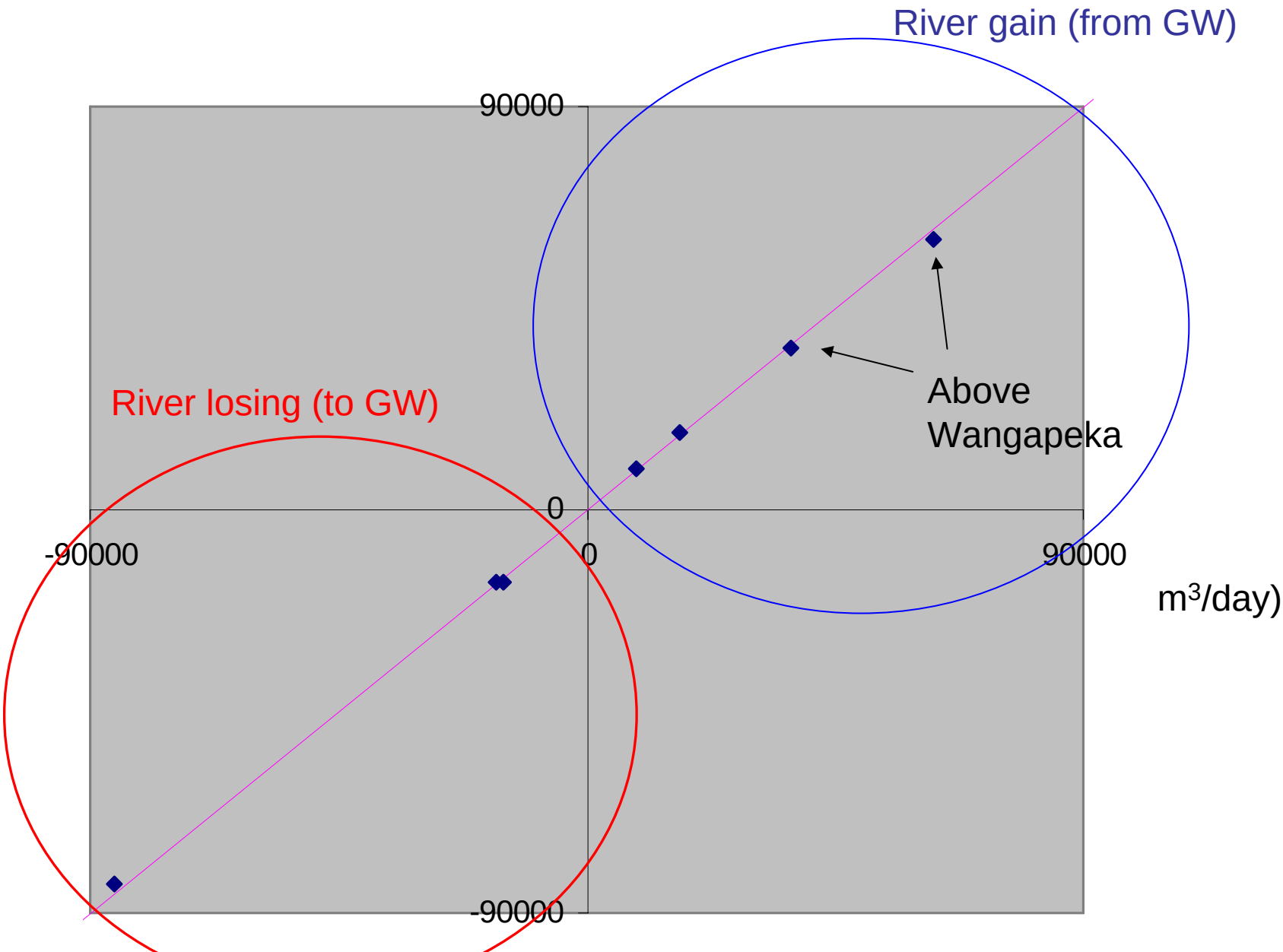


- Predicting loss and gain in reaches

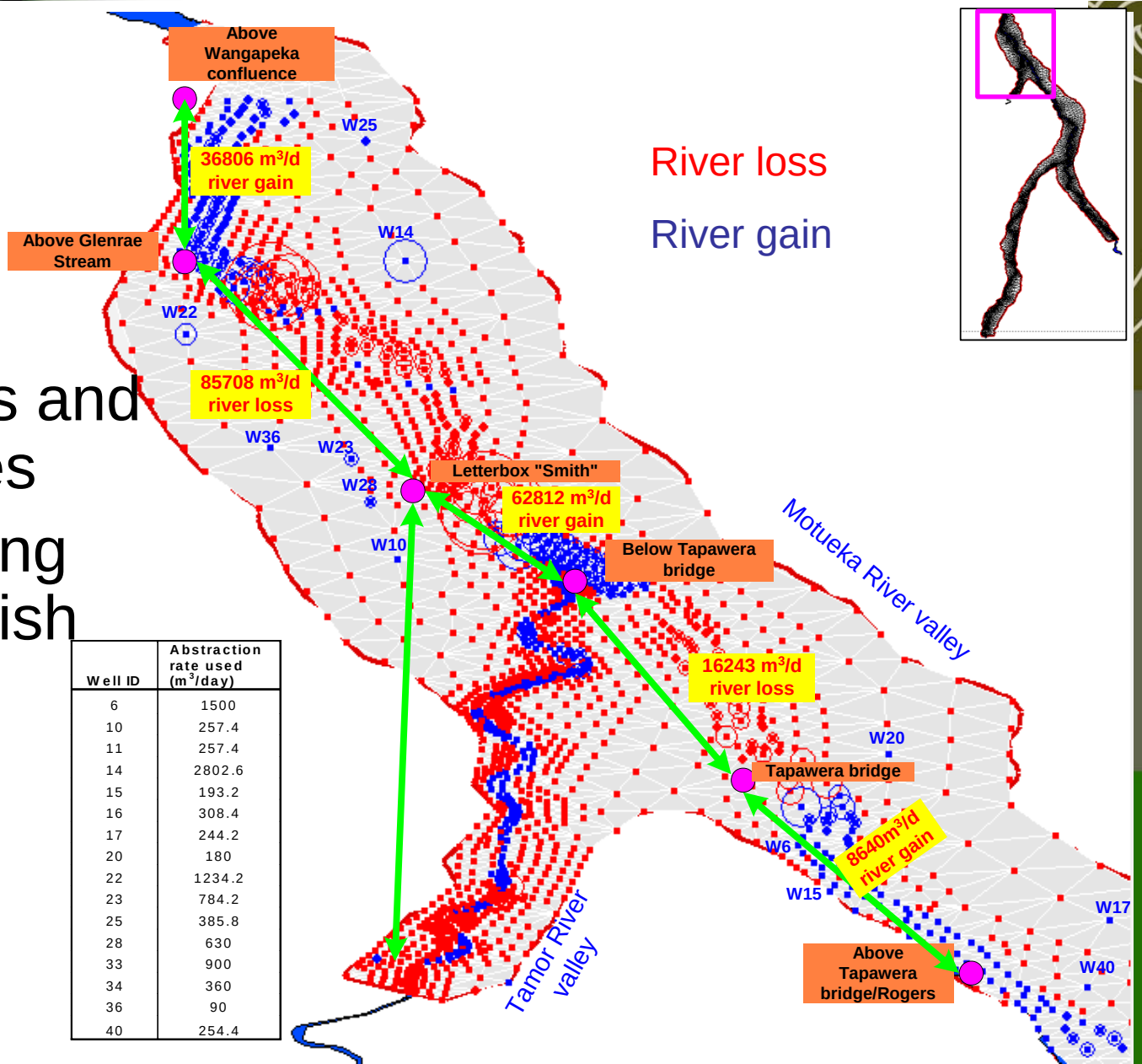


Well ID	Abstraction rate used (m^3/day)
6	1500
10	257.4
11	257.4
14	2802.6
15	193.2
16	308.4
17	244.2
20	180
22	1234.2
23	784.2
25	385.8
28	630
33	900
34	360
36	90
40	254.4

Observed vs predicted for separate reaches



- Predicting loss and gain in reaches
- Used for guiding field work on fish refuge



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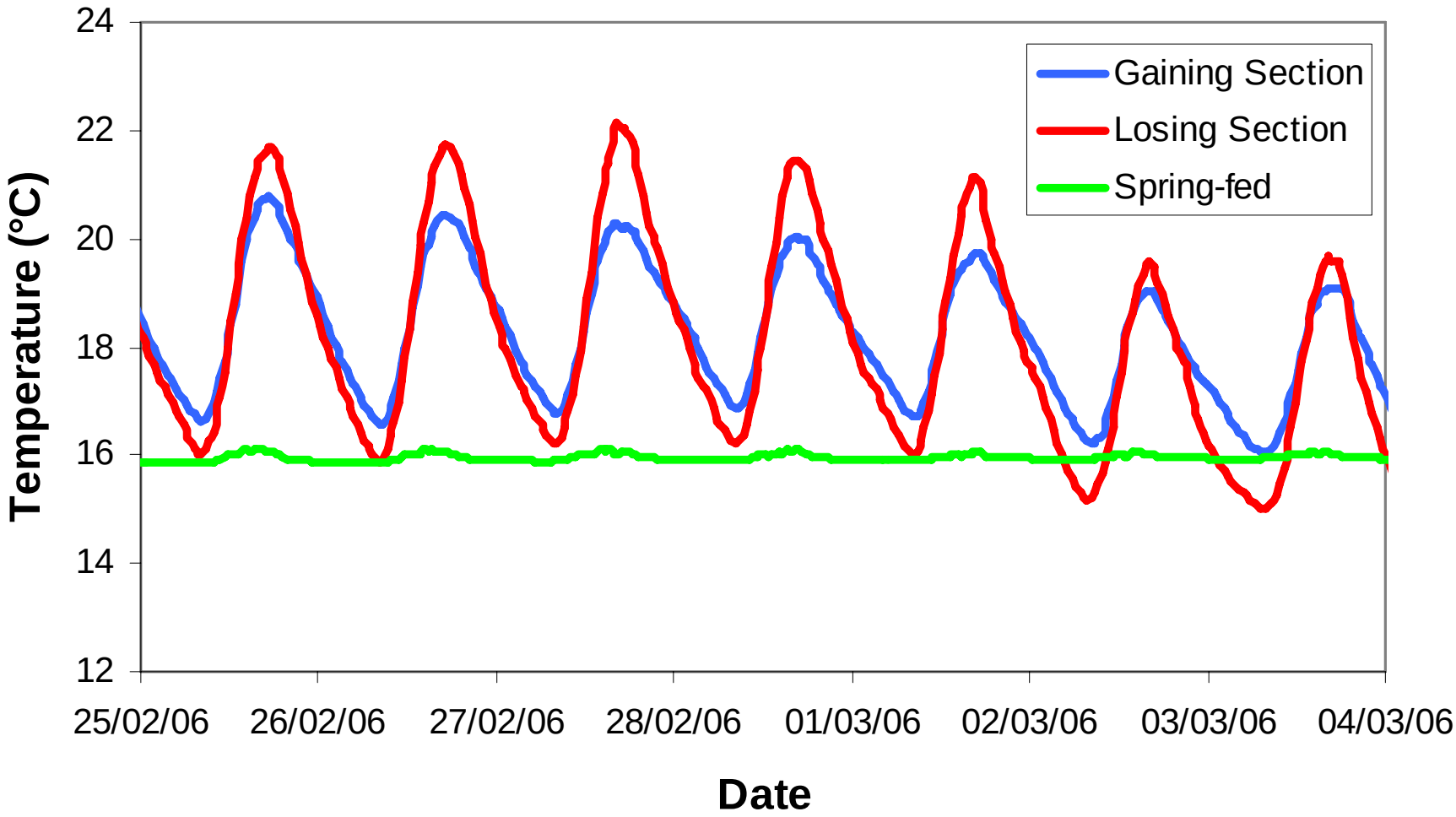
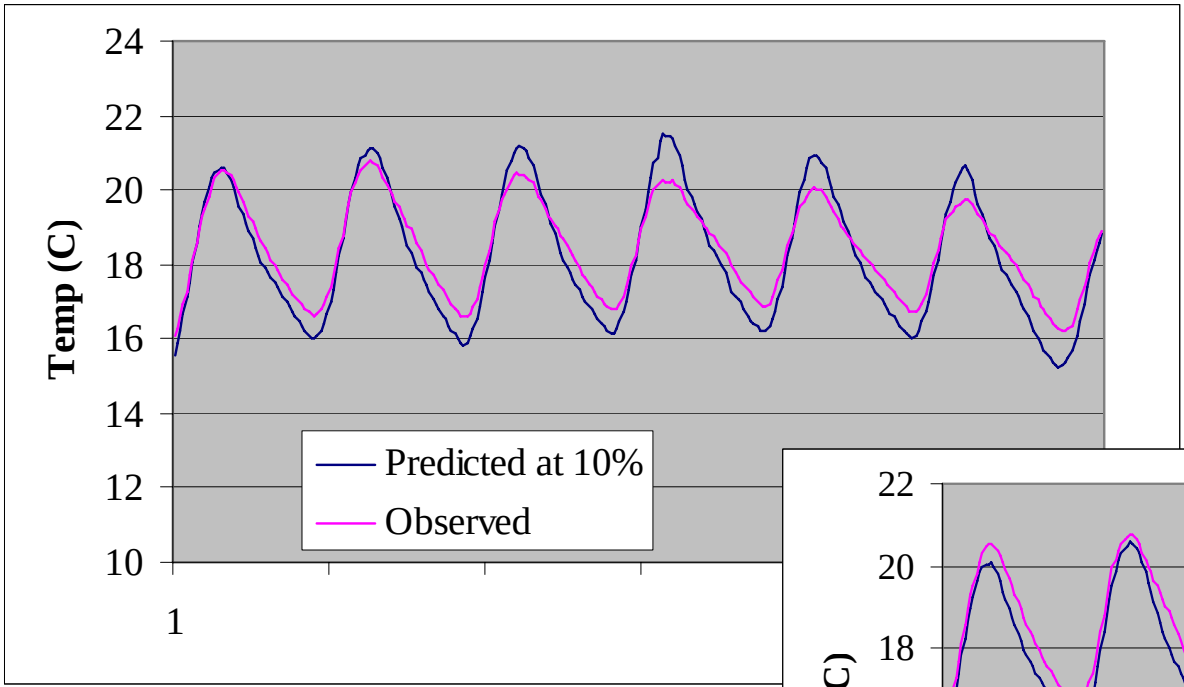
Cold water refuge for trout in summer

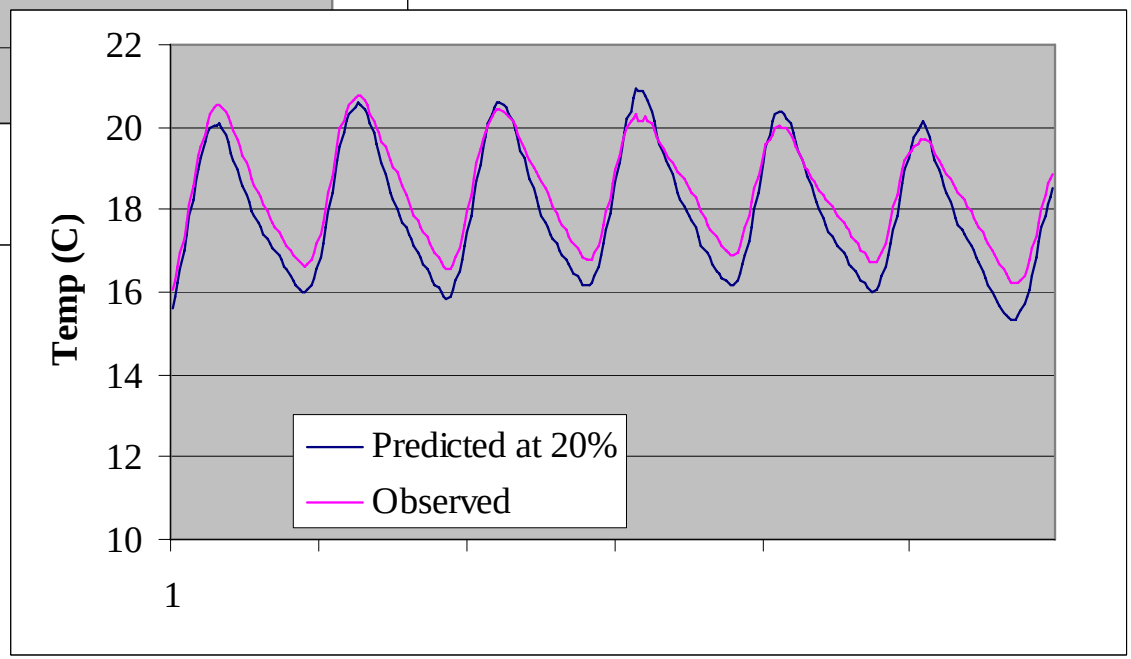
Temperature regime



Mixing model on temperature data



- Predicting mixed water from temps in cold and upstream



Summary 1

- Mixing model suggests potential for 10-20% of water at site is from cold source
- As much as 0.5 m^3/s
- 30% gain predicted by model for whole reach

Summary 2

- Integration between disciplines has allowed allowed data gathering of mutual benefit
- Temperature data has and will add to understanding of groundwater-river interaction
- Modelling beneficial for river ecology planning (and vice versa)