



Earthquake impacts on estuary water quality

Lesley Bolton-Ritchie

Ammonia nitrogen

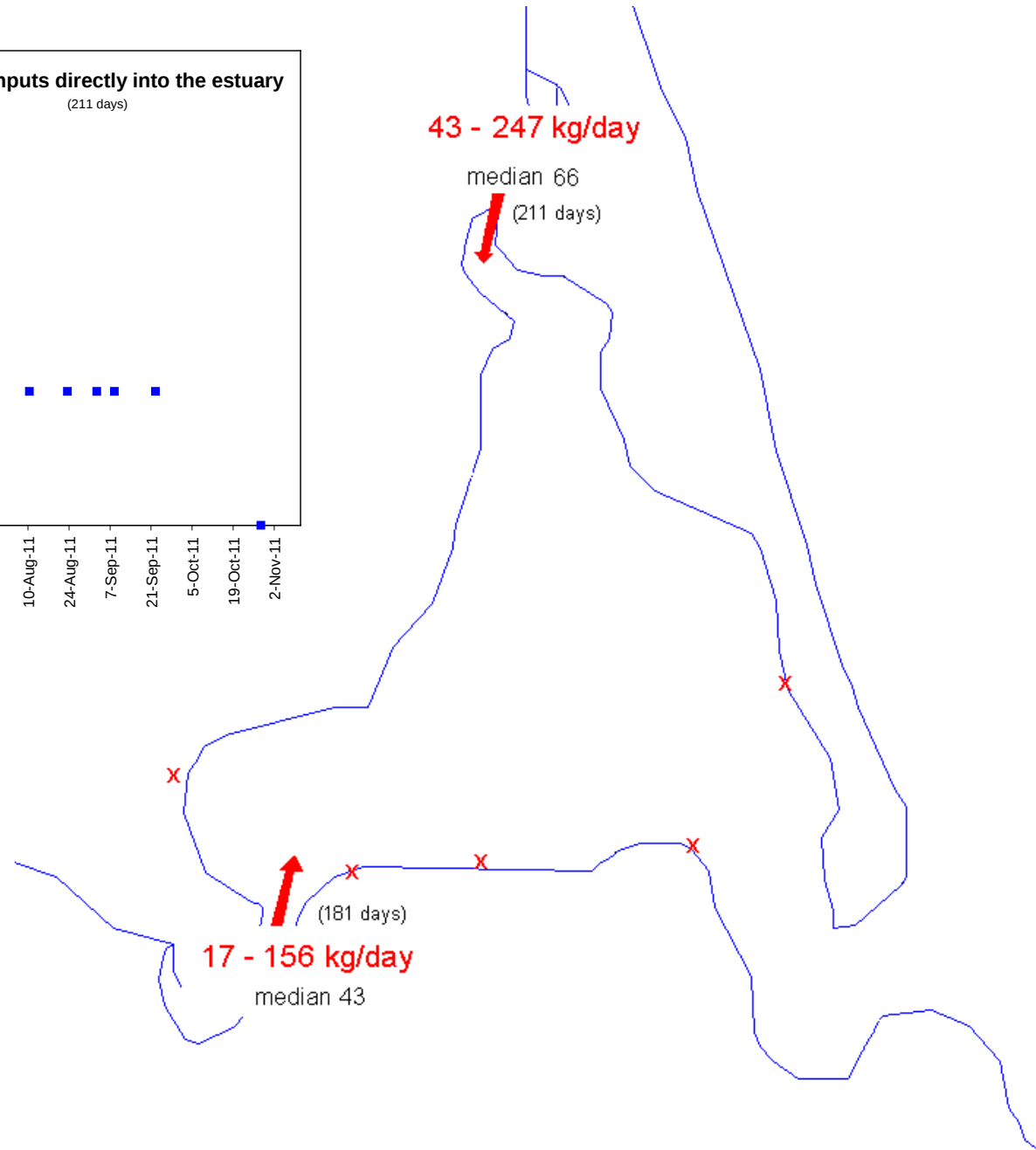
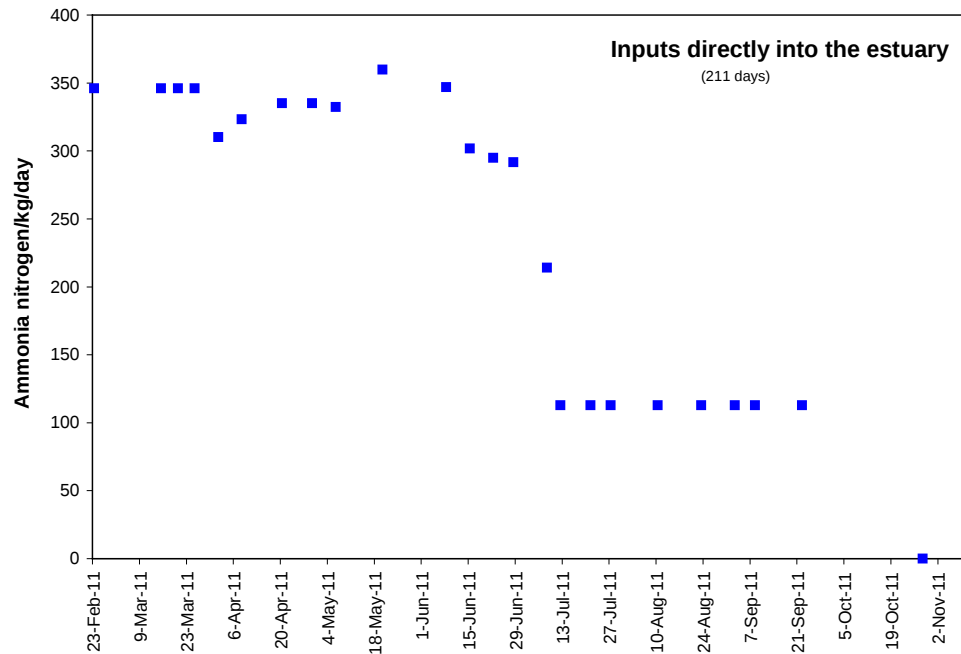
- from human effluent

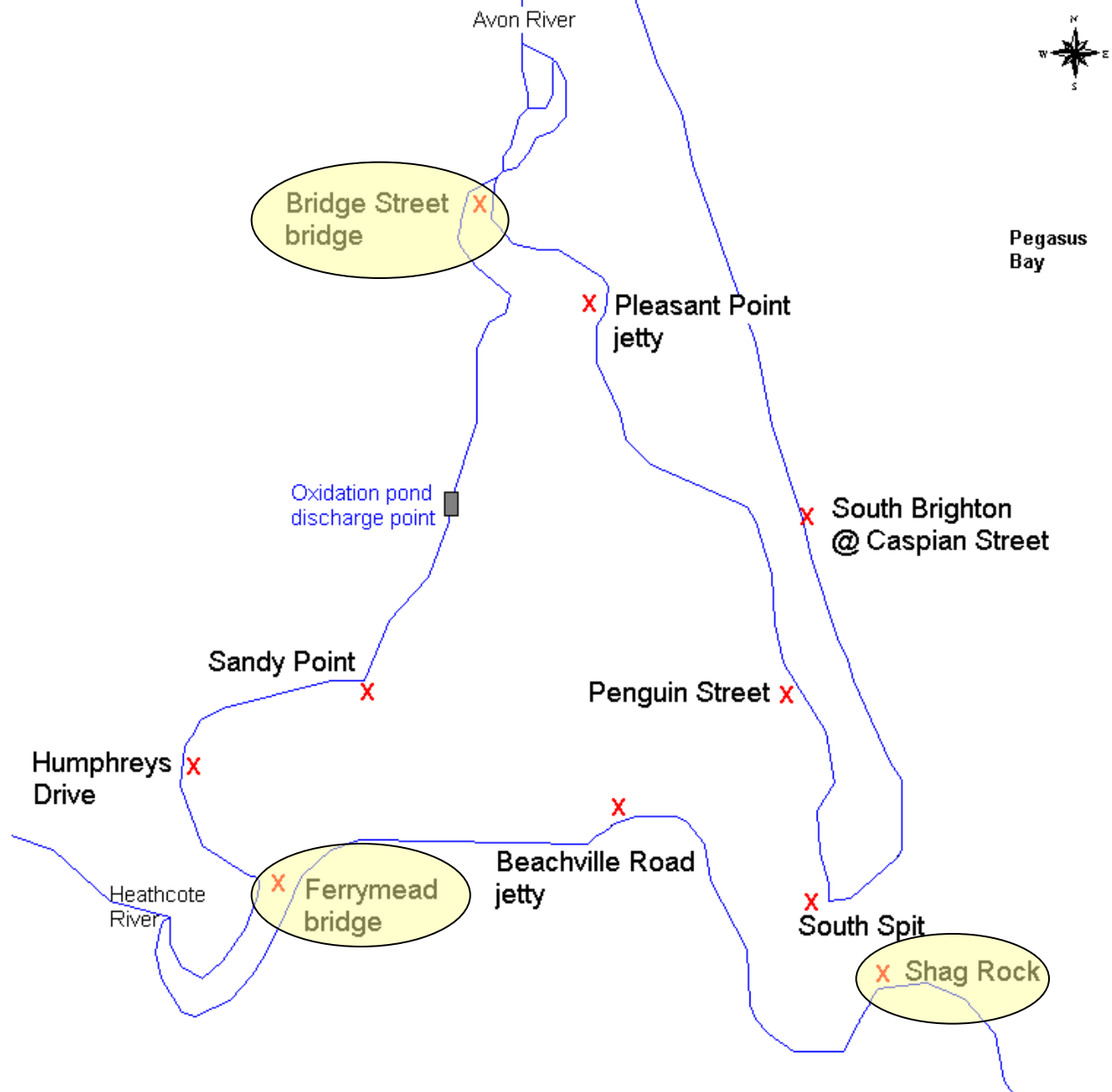
Dissolved oxygen saturation

Concentrations of bacteria that indicate faecal contamination

- enterococci in salty water
- *E.coli* in freshwater

Ammonia nitrogen to the estuary





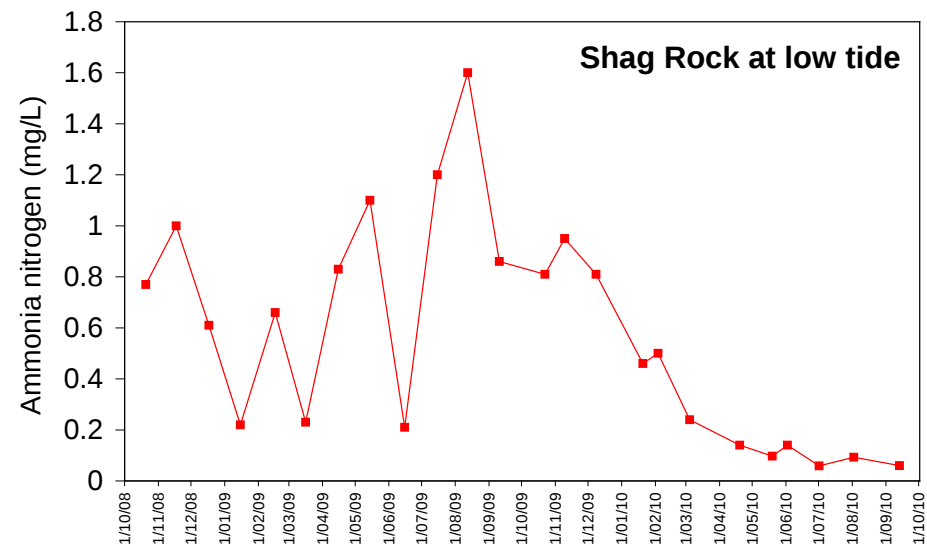
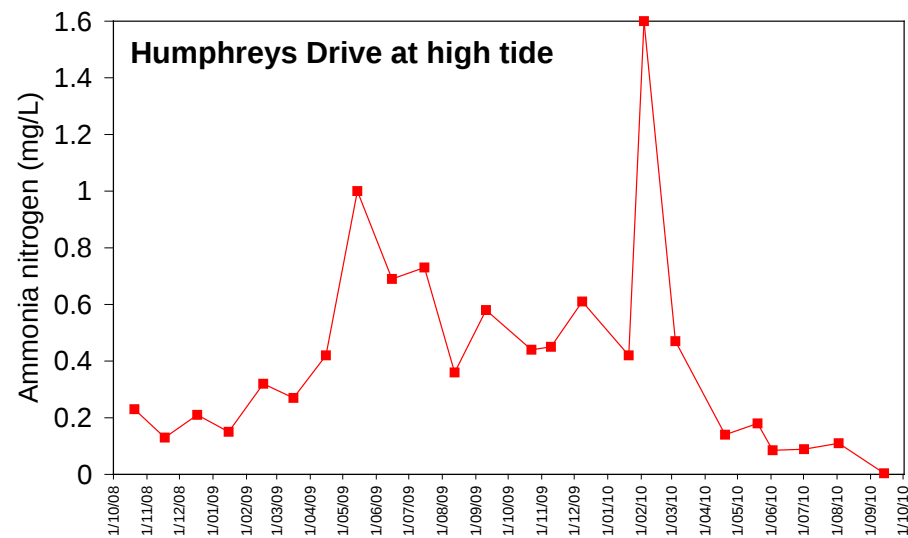
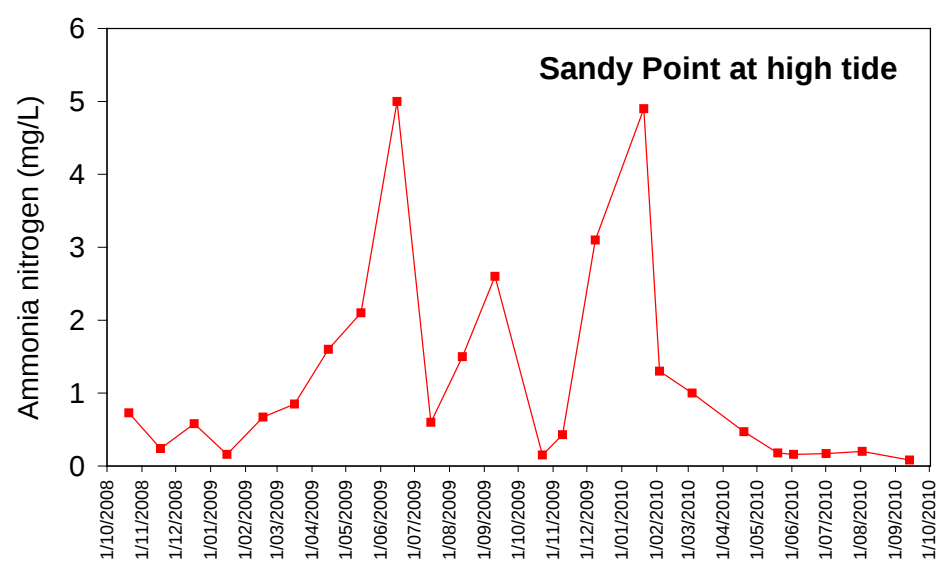
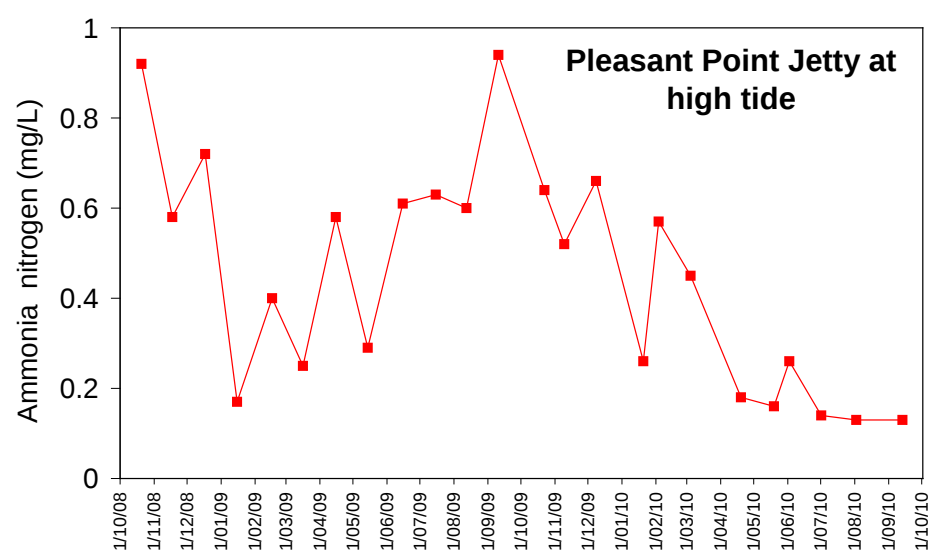
Ammonia nitrogen potential toxicity

Concentrations compared to guideline trigger value of 0.91 mg/L in sea water

Guideline trigger value exceeded at

Sandy Point - 24 March, 11 April and 19 September

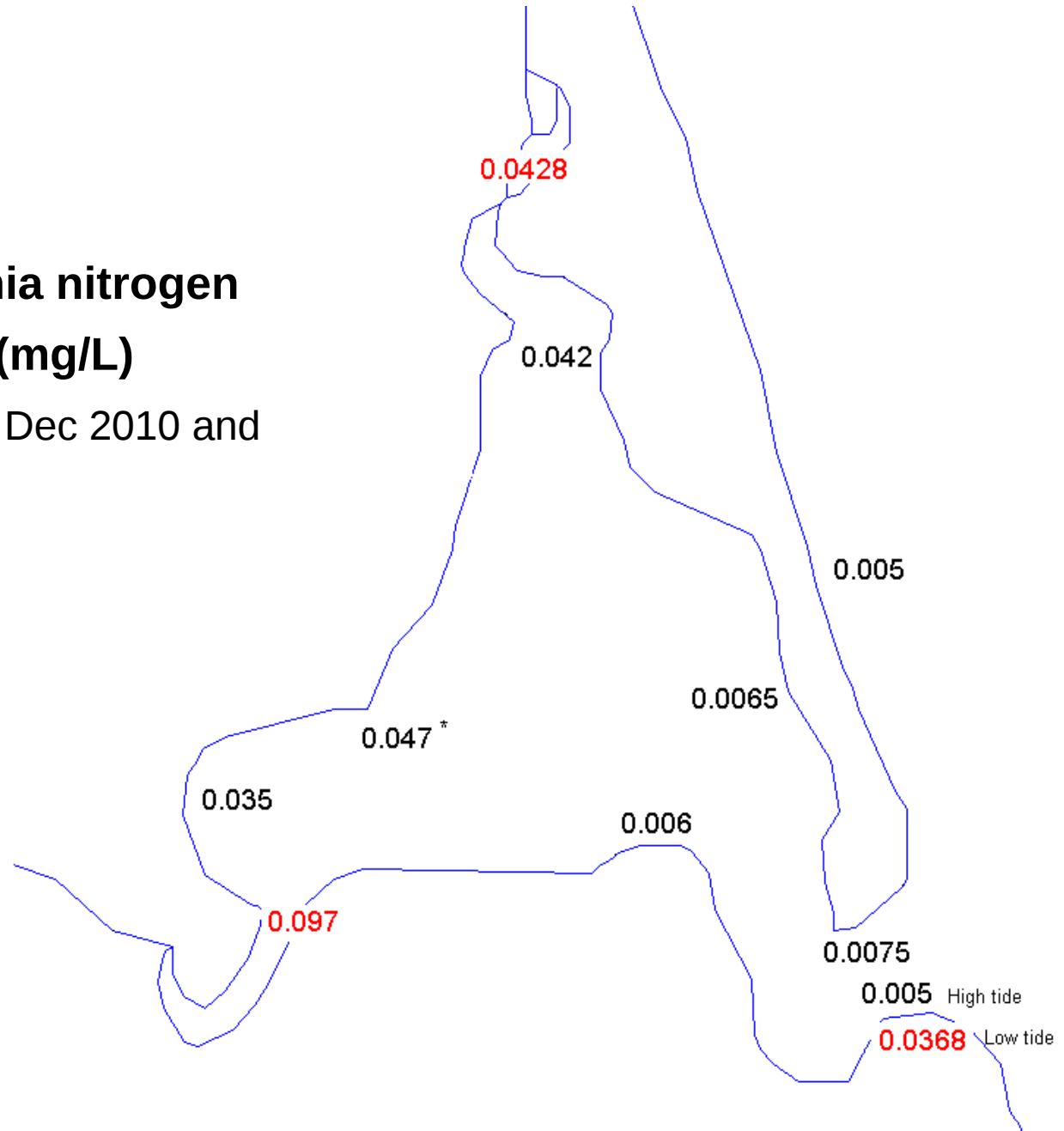
Penguin Street - 19 September



‘NON IMPACT’ ammonia nitrogen concentrations

Average ammonia nitrogen concentrations (mg/L)

(4 data points Nov, Dec 2010 and Jan, Feb 2011)



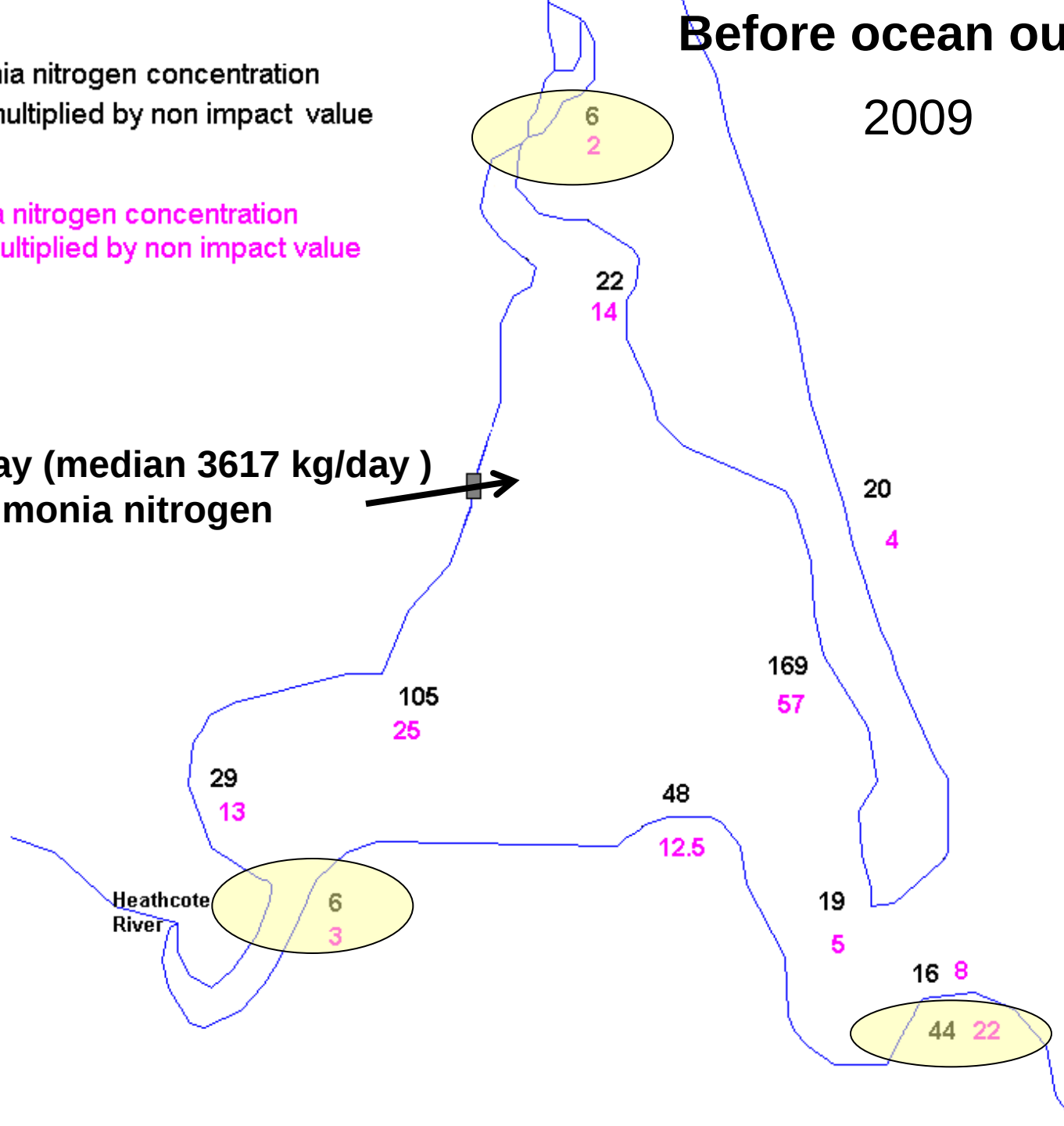
Before ocean outfall

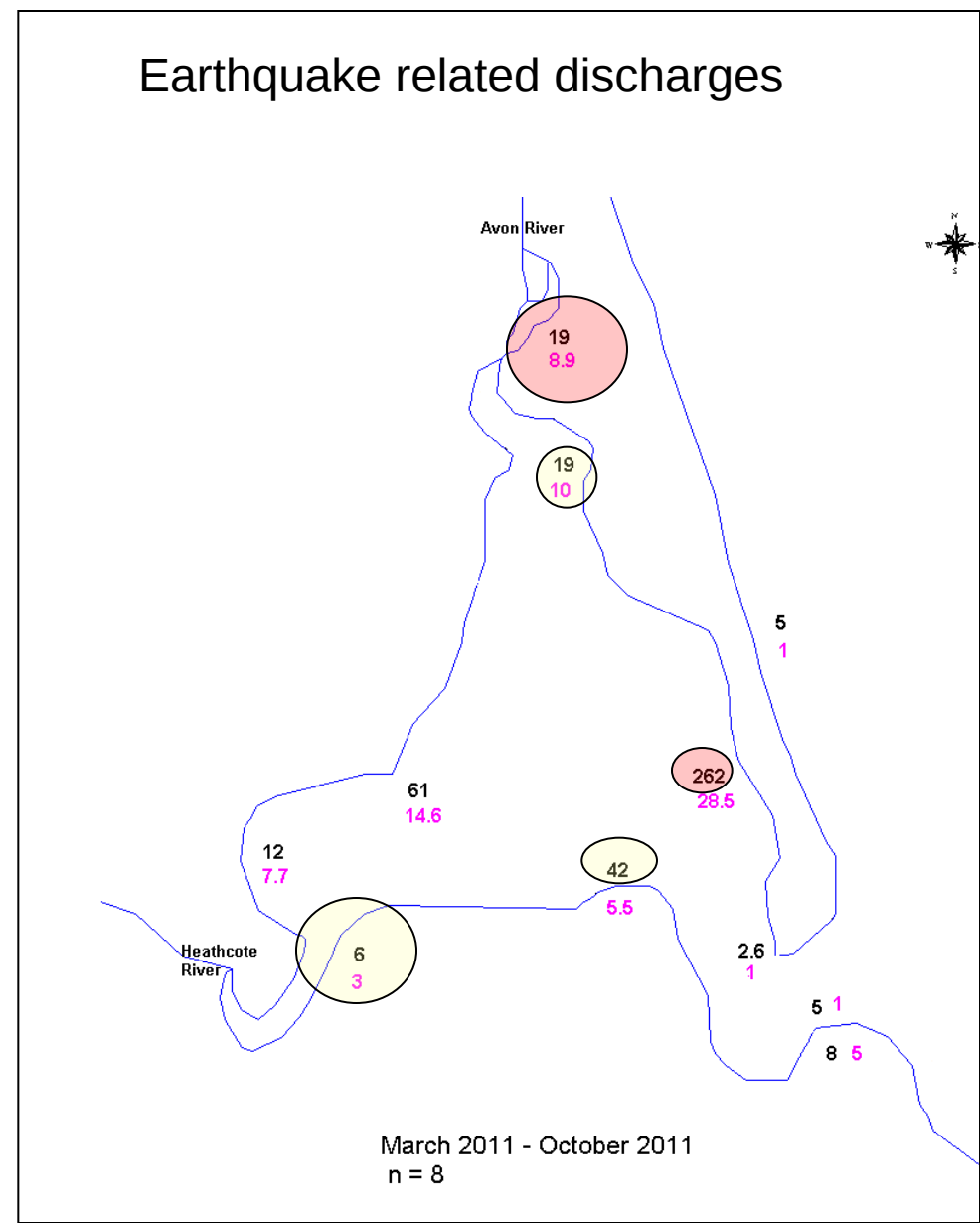
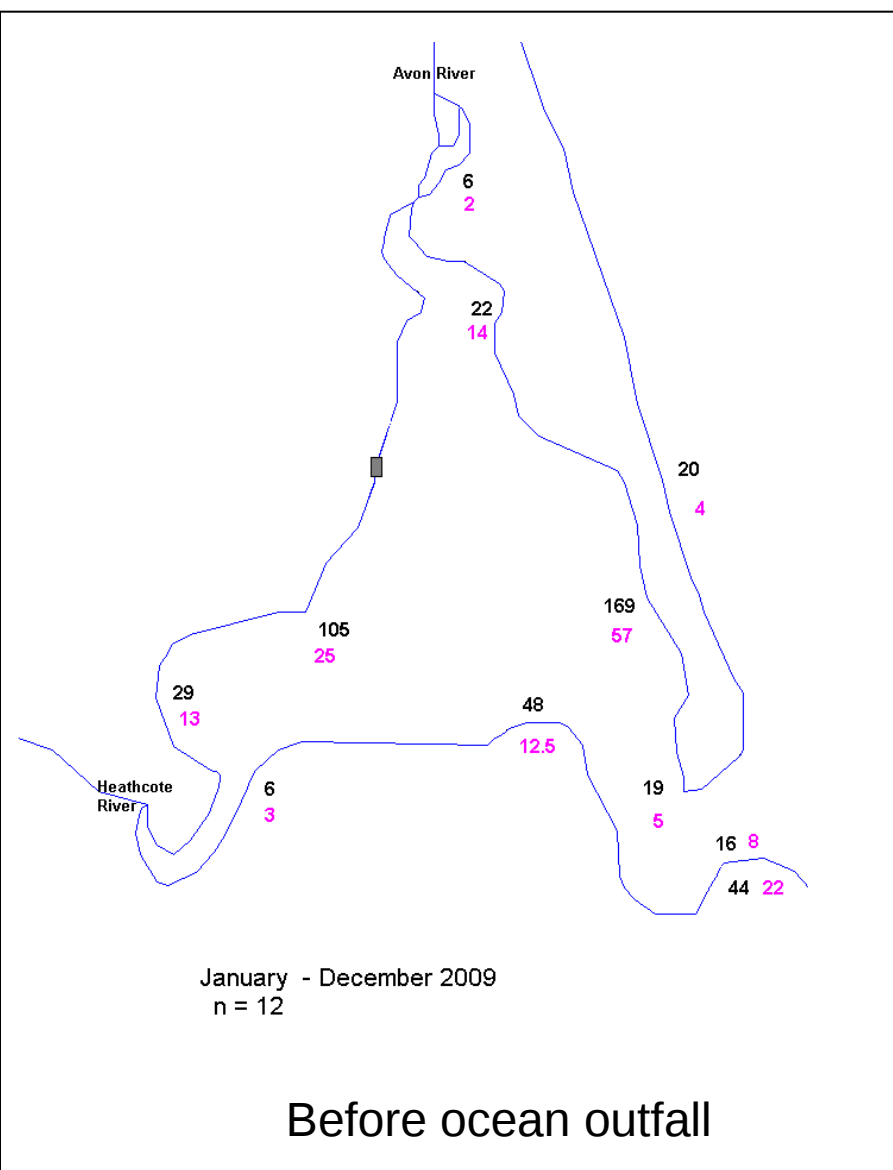
2009

Highest ammonia nitrogen concentration
= value shown multiplied by non impact value

Median ammonia nitrogen concentration
= value shown multiplied by non impact value

80 – 7236 kg/day (median 3617 kg/day)
Of ammonia nitrogen







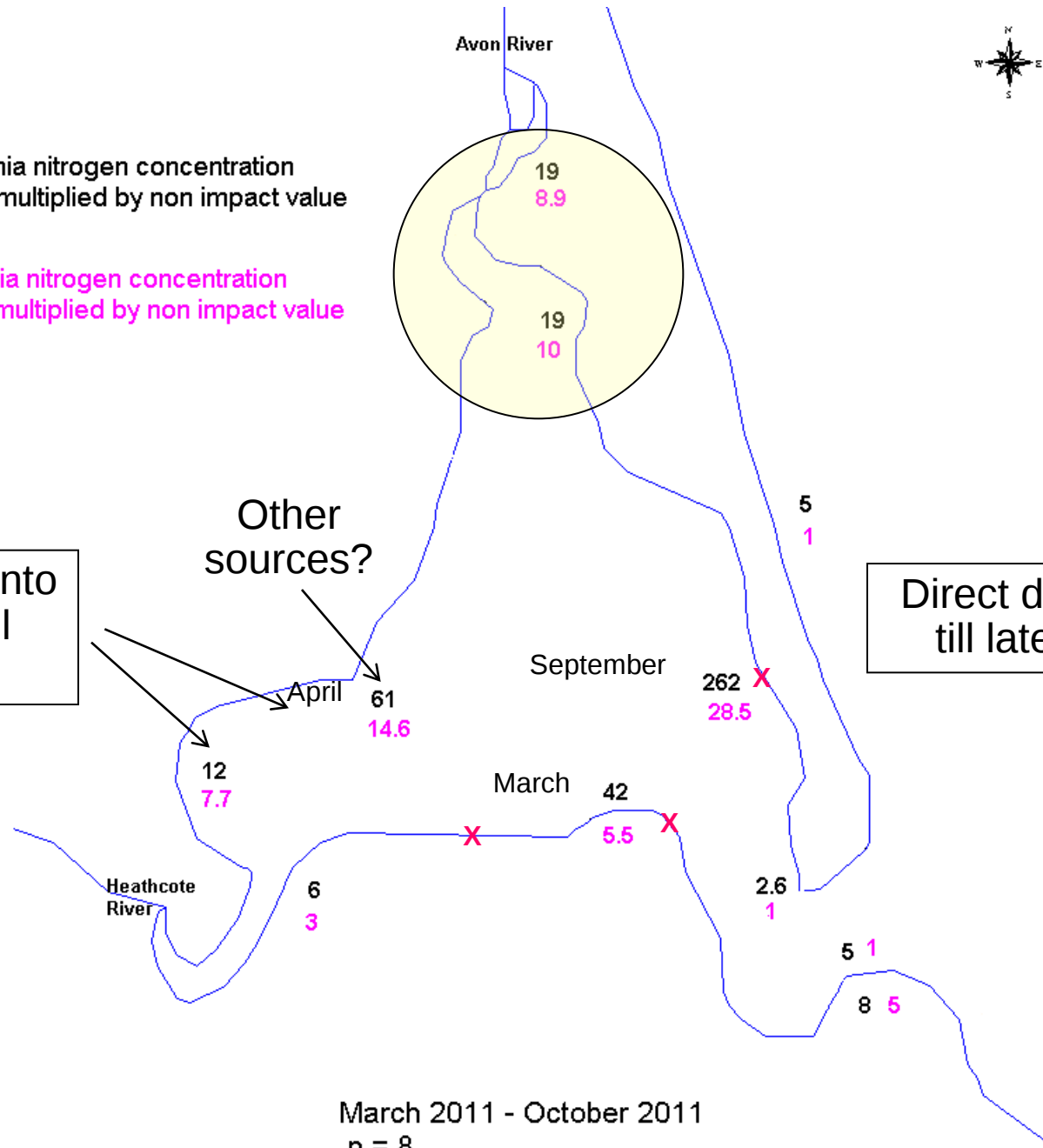
Highest ammonia nitrogen concentration
= value shown multiplied by non impact value

Median ammonia nitrogen concentration
= value shown multiplied by non impact value

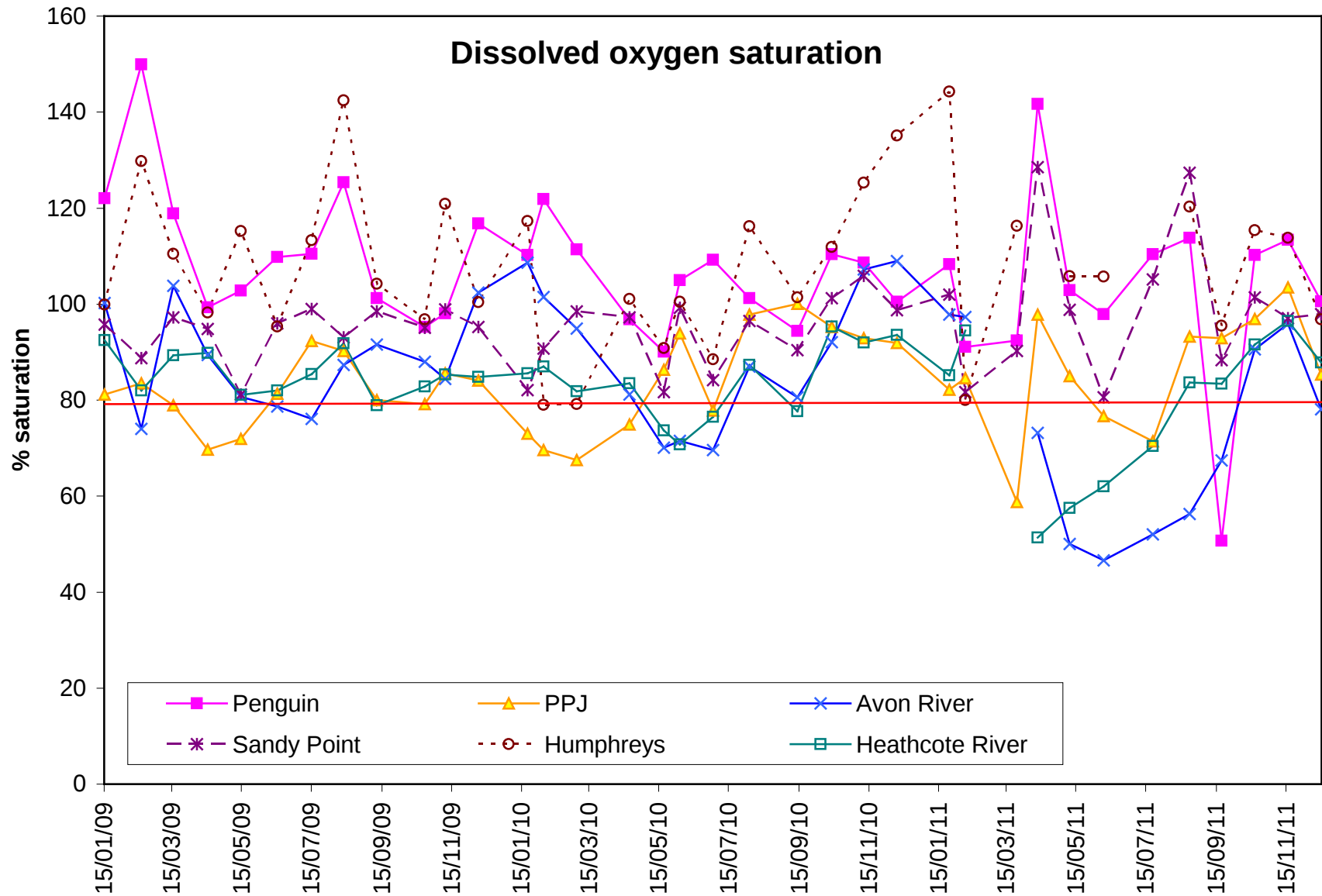
Discharges into
City outfall
Drain ?

Other
sources?

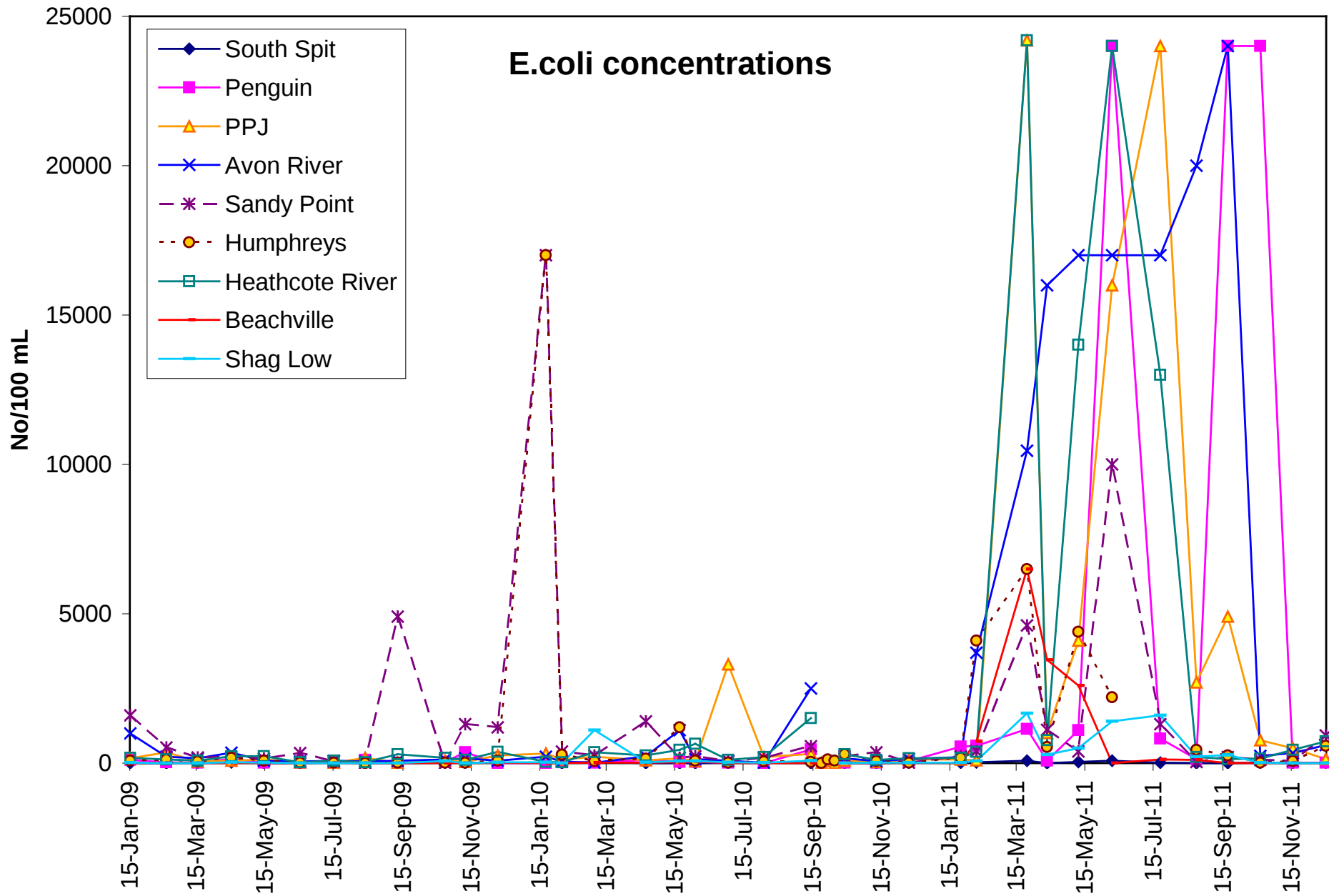
Direct discharge at
till late October

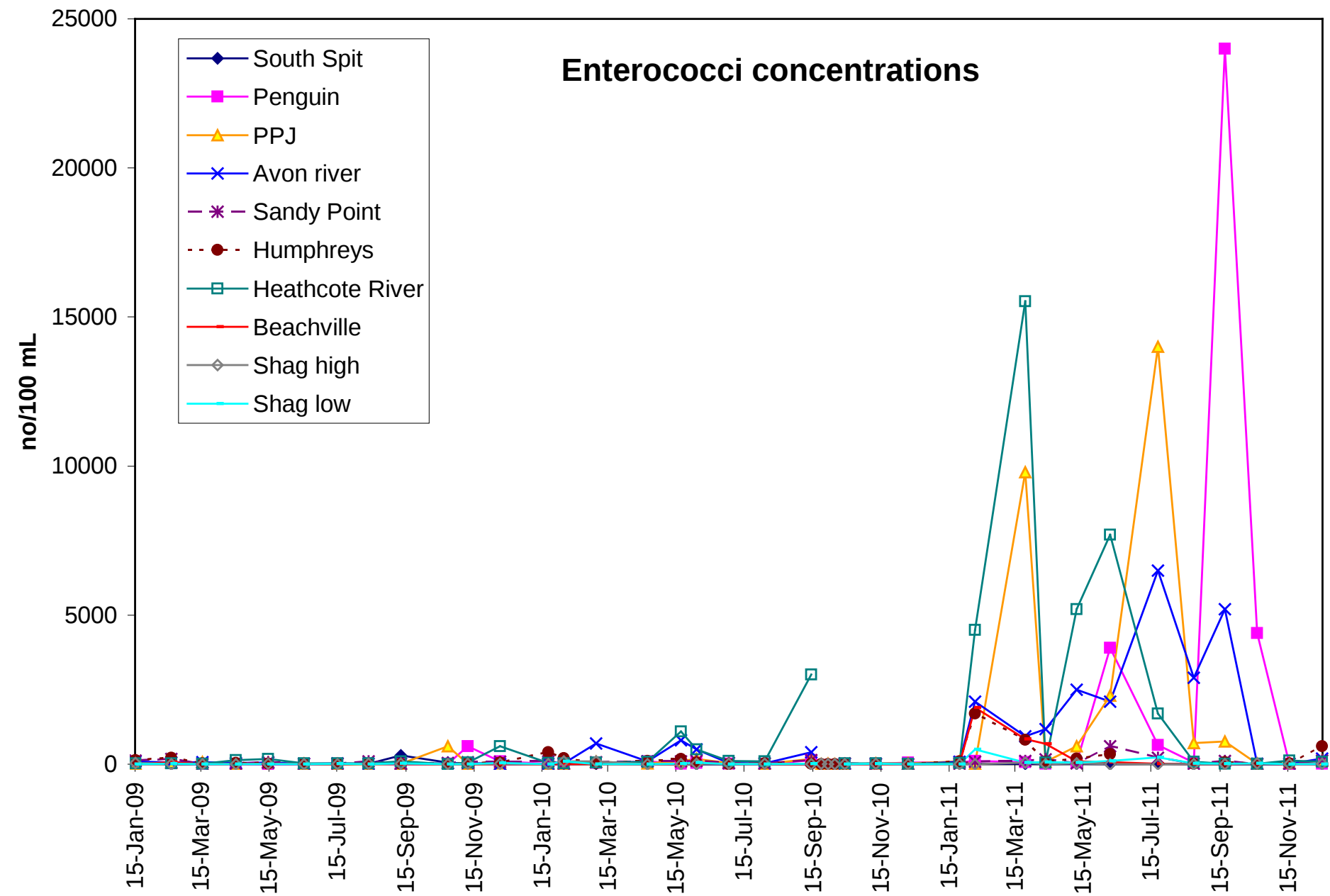


Dissolved oxygen saturation



Bacteria that indicate faecal contamination





Thanks to

Christchurch City Council for supplying data

Julie Edwards

Fay Farrant

Patrick Lees

Environment Canterbury

