

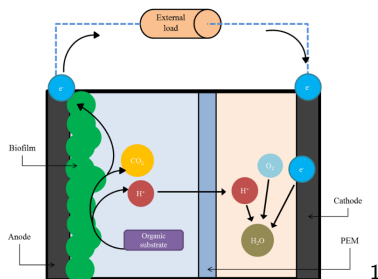
ITT6: Water Quality Testing with Bacteria

Nadeen, Elizabeth, Nicole, Lola, John and Eleanor

June 7, 2017

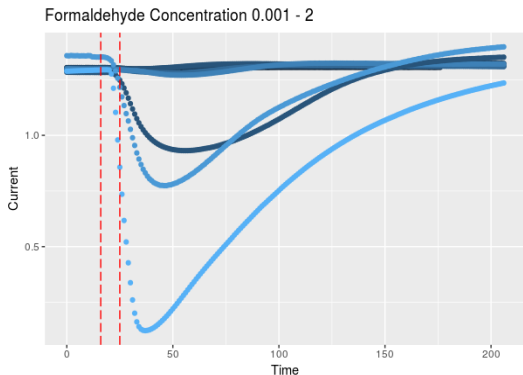
The Problem

- ▶ Bacterial fuel cell in water : current is dependent on level of contaminant and environmental conditions.
- ▶ Current drops and recovers as bacteria recover after a toxic event.
- ▶ AIM: use data on the change in current (in the form of these "current curves") to identify contaminants and safety of water.



¹Chouler and Di Lorenzo, Biosensors, 5(3),450-470,(2015)

The Data



- ▶ Change in current from a biocell conditional upon the change in temperature, pH and a pollutant (formaldehyde).
- ▶ Plot shows current with addition of formaldehyde at different concentrations.

Where do we go from here?

Experimental Design:

- ▶ Current data has only one change of variable at a time: What kind of data would best inform statistical analysis?

Statistical analysis:

- ▶ Changepoint analysis on simulated data
- ▶ Characterise curve shapes to predict concentration
- ▶ Functional data analysis