Chemical Oceanography
SOI 2014 Planning Workshop

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AIMS: Australia’s tropical marine research agency.
Why coastal?

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But it is not fun
Baselines for ocean acidification

- New continuous measurements of carbon chemistry on R.V. Cape Ferguson and on Davies Reef
- Detailed sampling in strategic areas
- Data used to develop a carbon budget for the GBR
Increased spatial information

From this 1974 flood from Burdekin River

To this 1973 drought year
• Charge state of dissolved organic matter
• pH affects:
  – Binding by organic matter of other chemicals
  – Release by organic matter of bound chemicals
  – Response of physiological sensors
  – pKa of bioactive chemicals changing their bioactivity
• In-sea metabolomics
Increased spatial information

Mother duck and duckling model
Our working environment
Mobile phone microscopy

Capitalising on consumer electronics innovation
Handheld, connected spectroscopy
USB powered sequencer and PCR machines
Arduino + LED’s – cheap seawater pH sensor
A proving ground for ReefTech

- Workshops for construction, prototyping, modifying, repairing
- Facilities for launch & recovery (on-shore & floating i.e. vessels)
- Easy access to testing environment (Cleveland Bay for near shore and GBR)
- Laboratories for validating sensors and measurements devices
- Controlled facilities for testing, prototyping of new and improved tools before going to sea (SeaSim)
- Existing observing infrastructure to which we can attach improvements
Sea Simulator

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