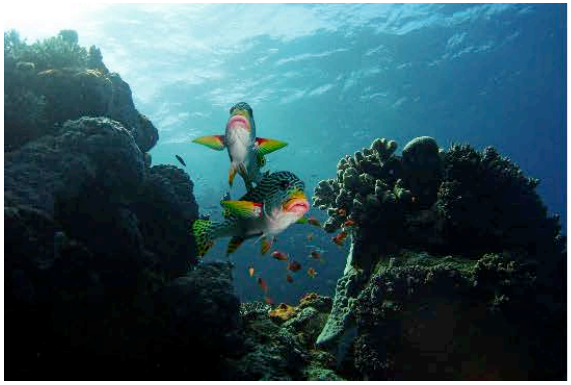
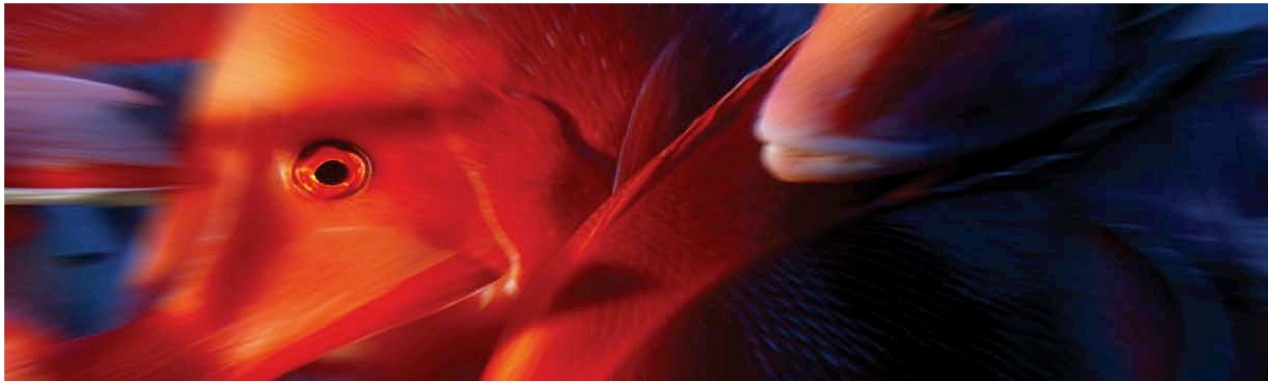




Chemical Oceanography

SOI 2014 Planning Workshop

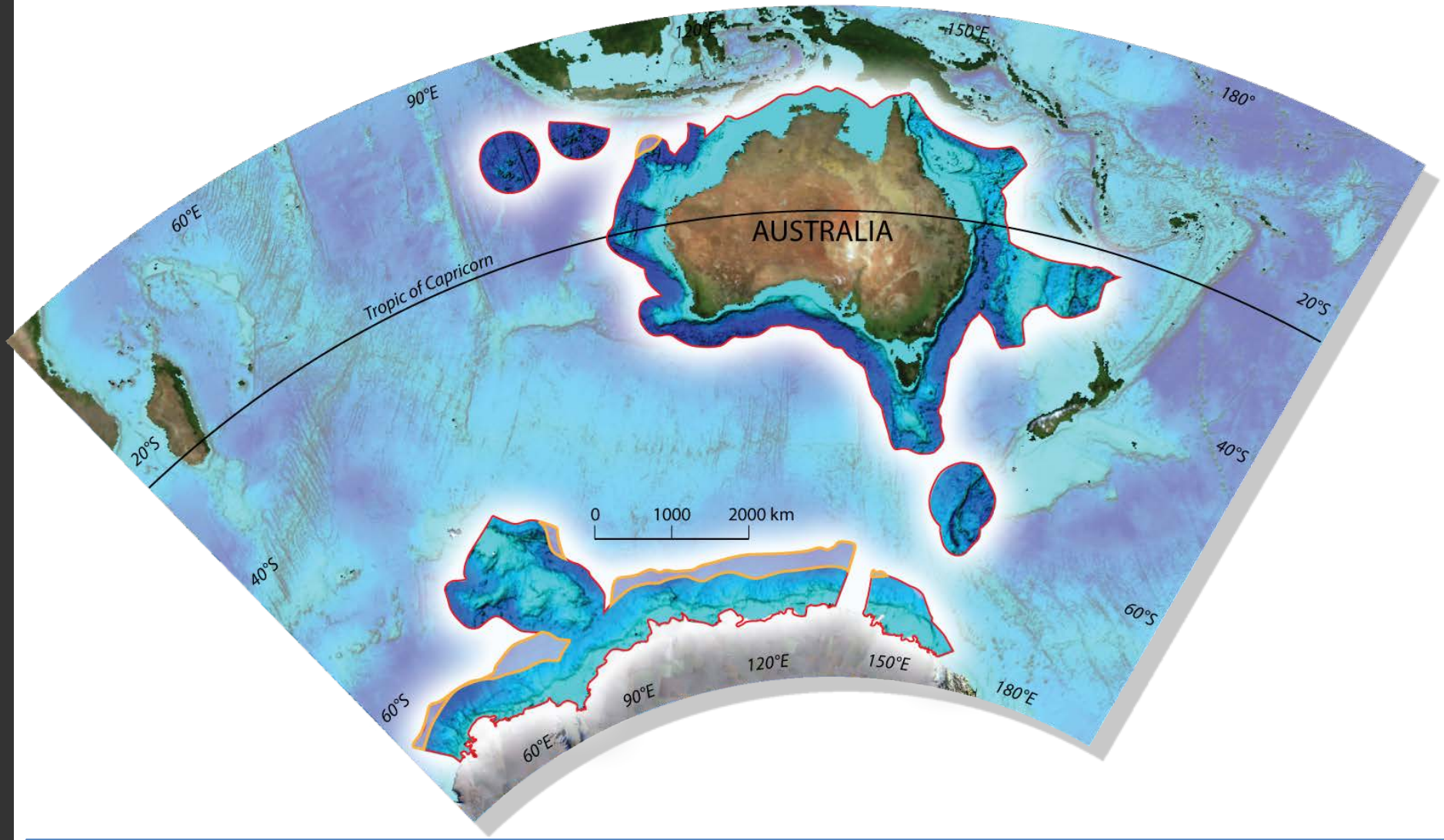
Lyndon Llewellyn

AIMS: Australia's tropical marine research agency.

Why coastal?

Australian Government

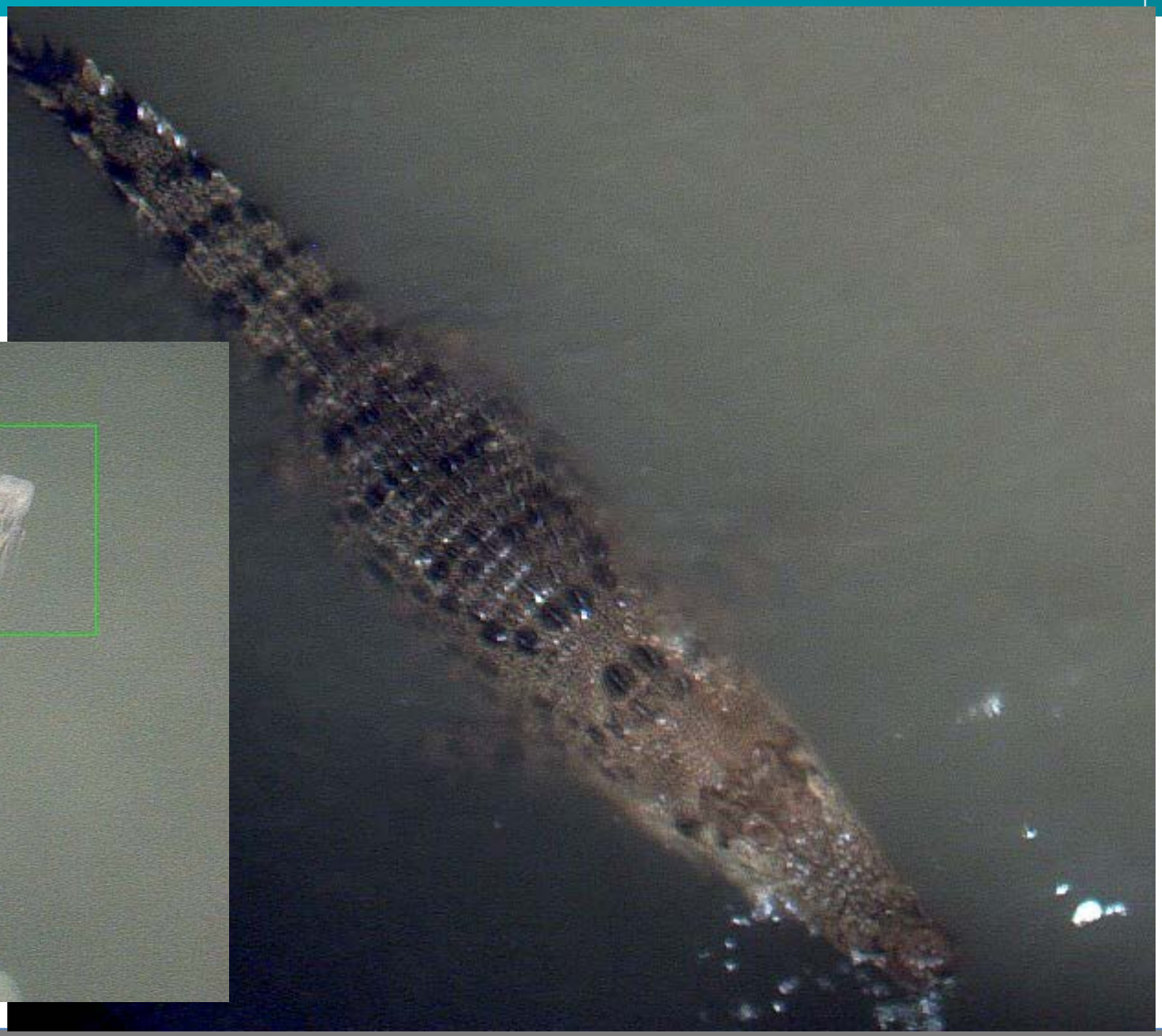
Australian Institute of Marine Science



But it is not fun

Australian Government

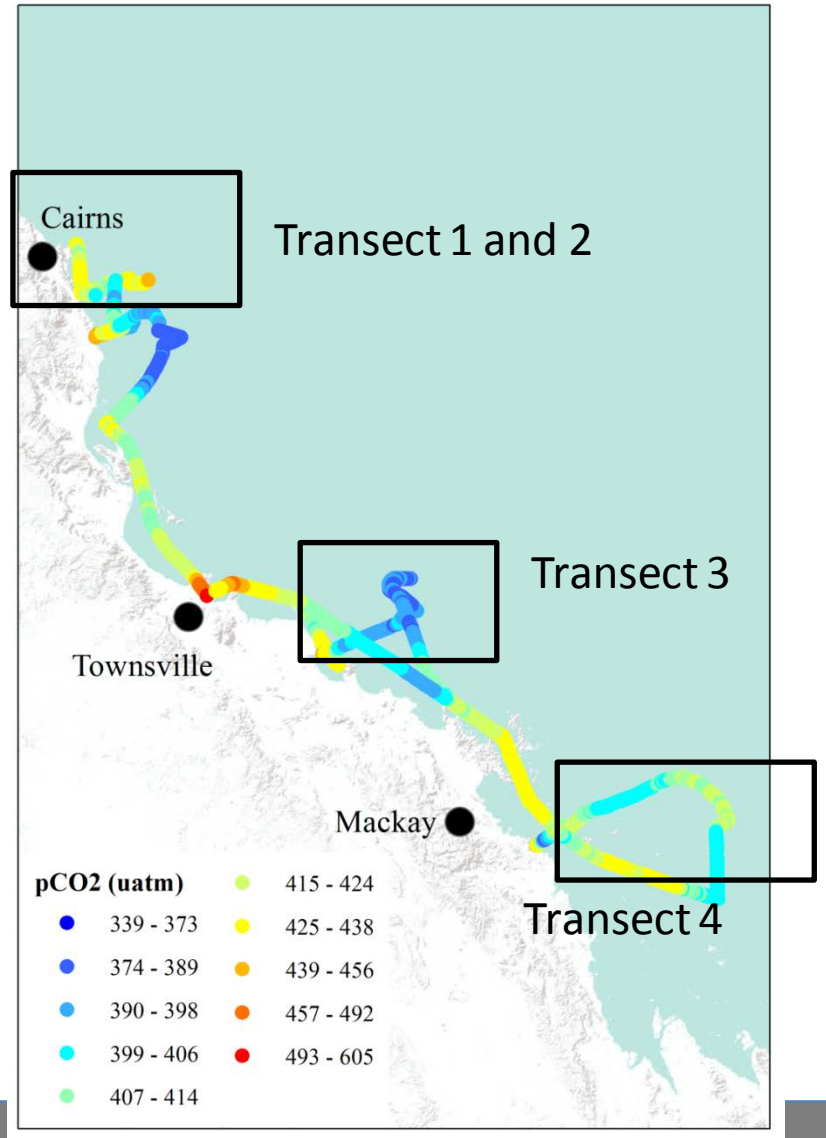
Australian Institute of Marine Science



Coastal ocean acidification

Australian Government

Australian Institute of Marine Science



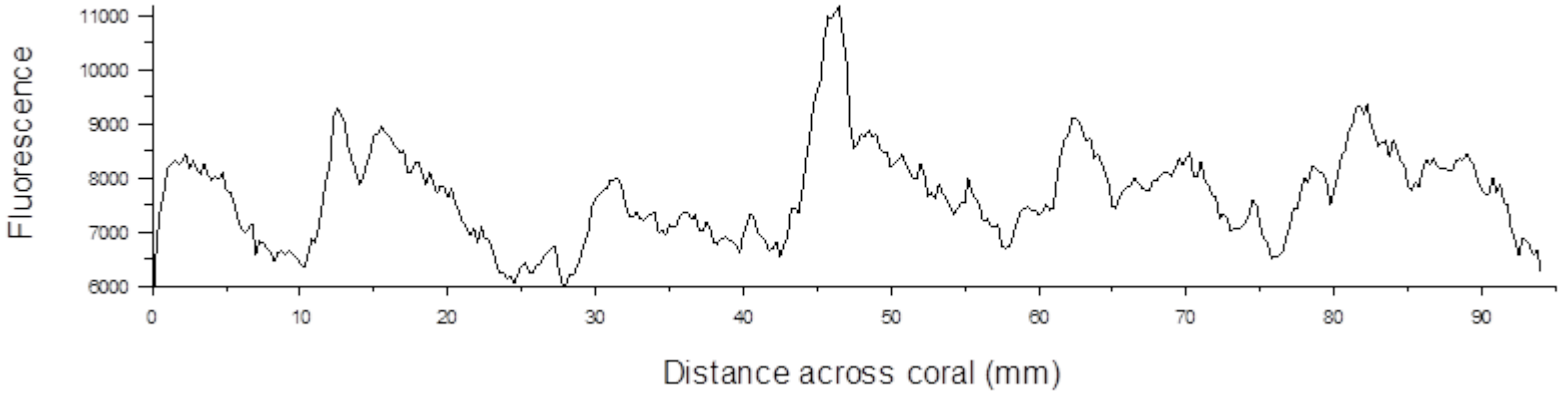
Baselines for ocean acidification

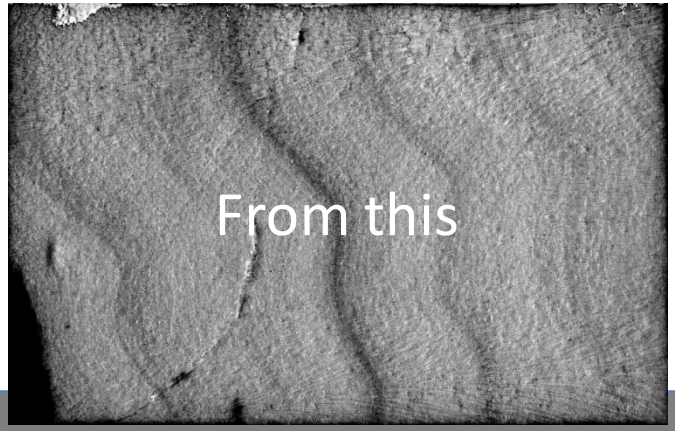
- New continuous measurements of carbon chemistry on R.V. Cape Ferguson and on Davies Reef
- Detailed sampling in strategic areas
- Data used to develop a carbon budget for the GBR

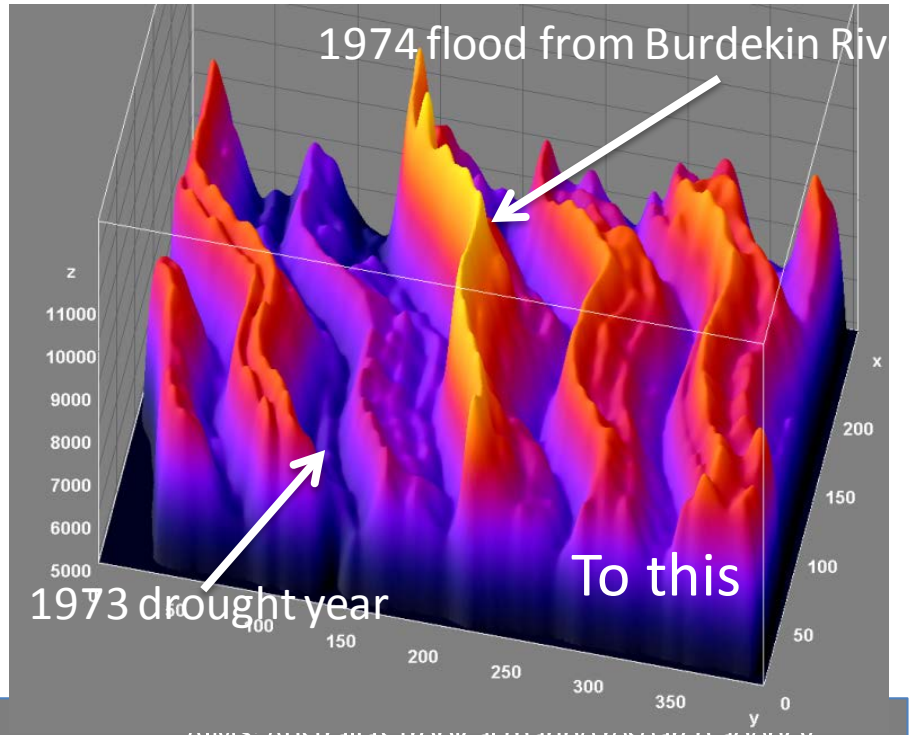
Increased spatial information

Australian Government

Australian Institute of Marine Science







Ecology

Australian Government

Australian Institute of Marine Science

- 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

Australian Government

Australian Institute of Marine Science

Mother duck and duckling model

Our working environment

Australian Government

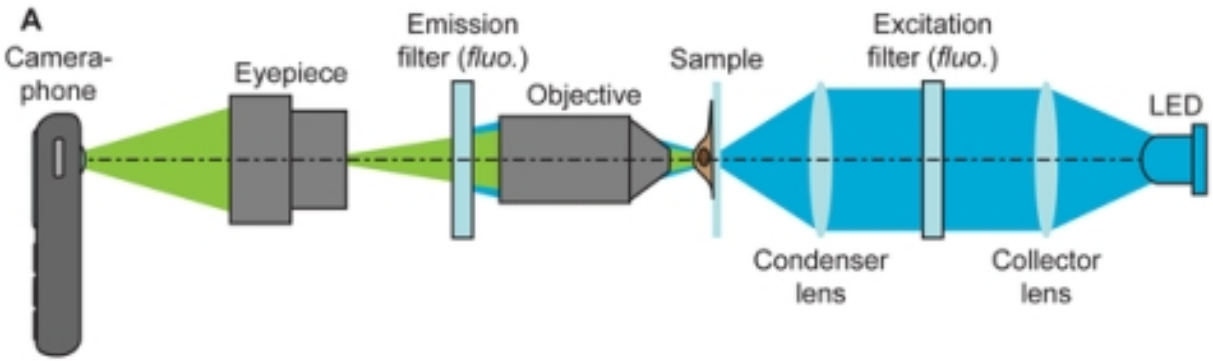
Australian Institute of Marine Science

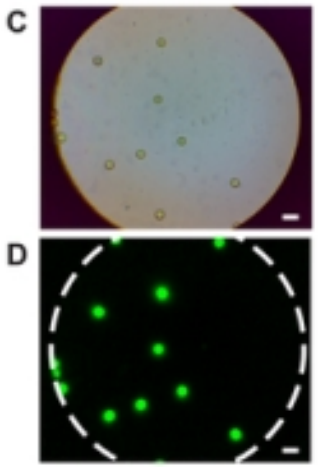
Capitalising on consumer electronics innovation

Australian Government

Australian Institute of Marine Science

Mobile phone microscopy

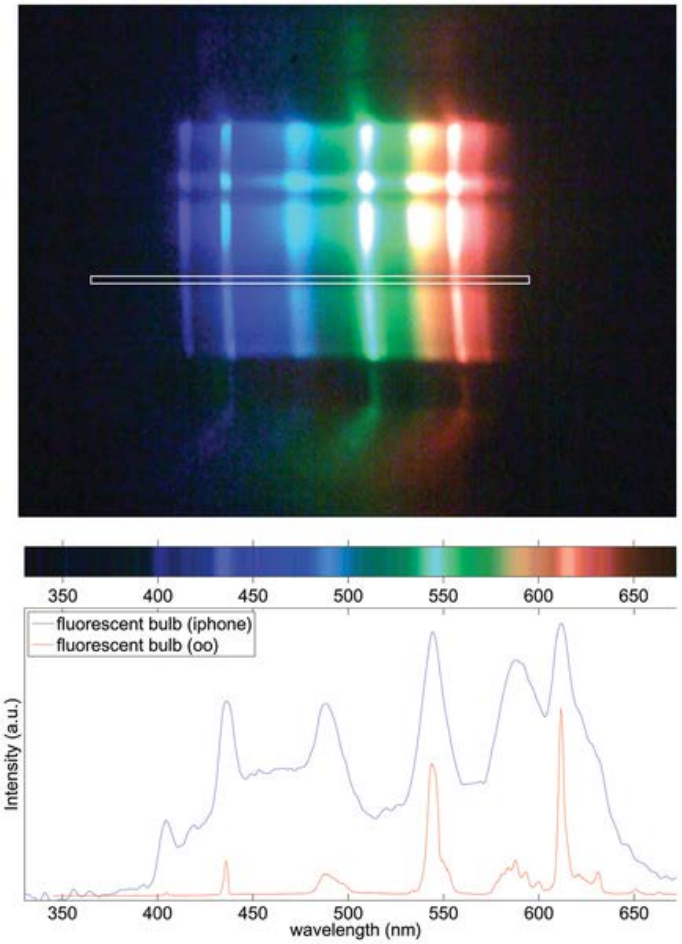


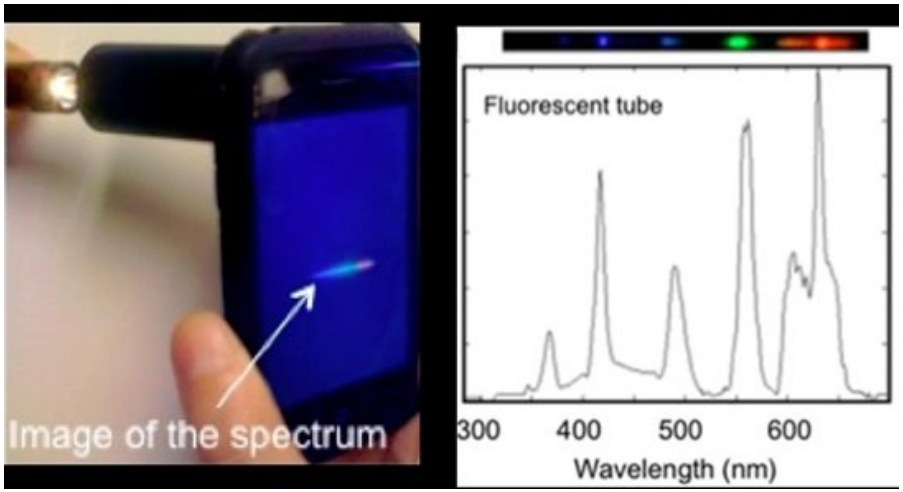


Handheld, connected spectroscopy

Australian Government

Australian Institute of Marine Science

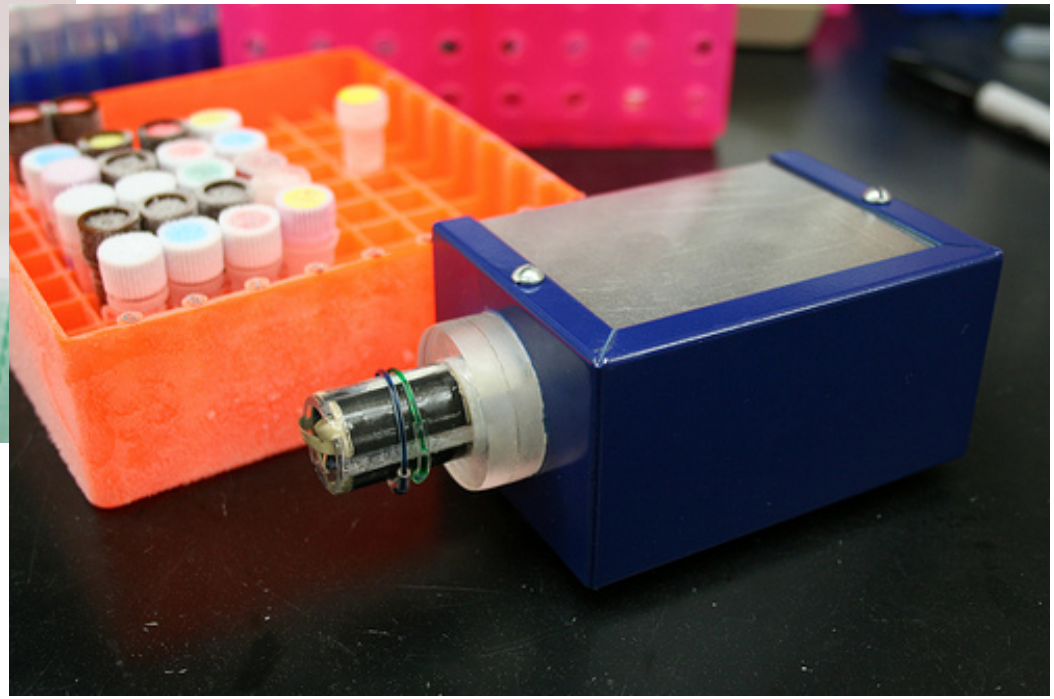




USB powered sequencer and PCR machines

Australian Government

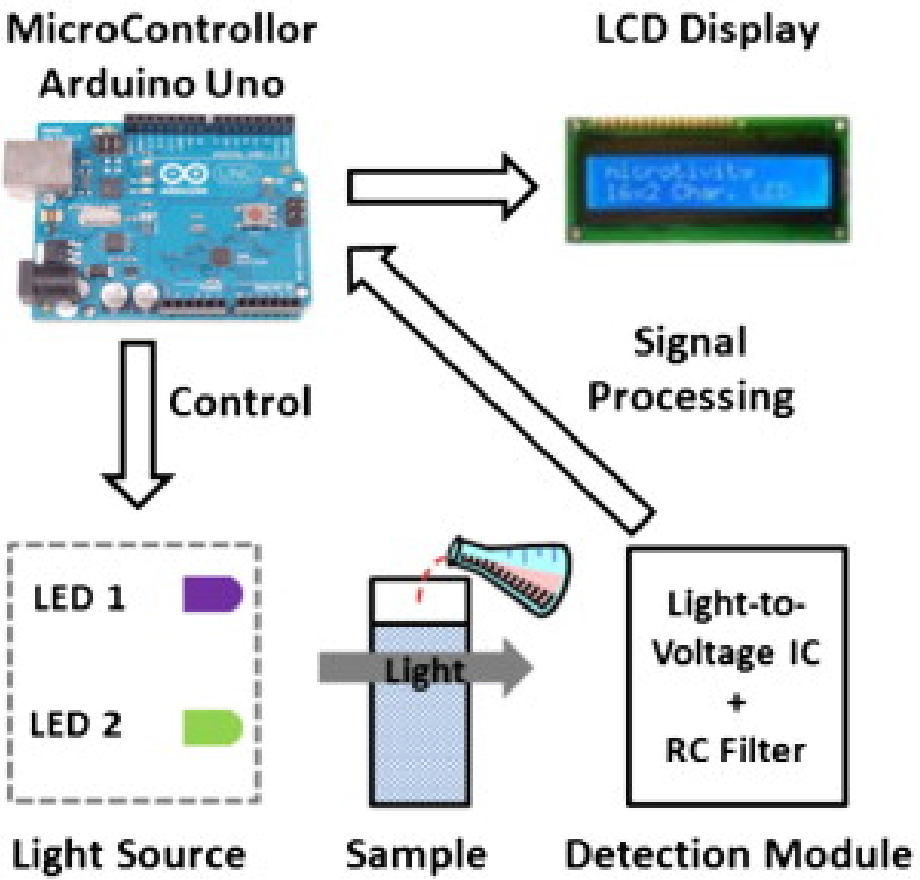
Australian Institute of Marine Science

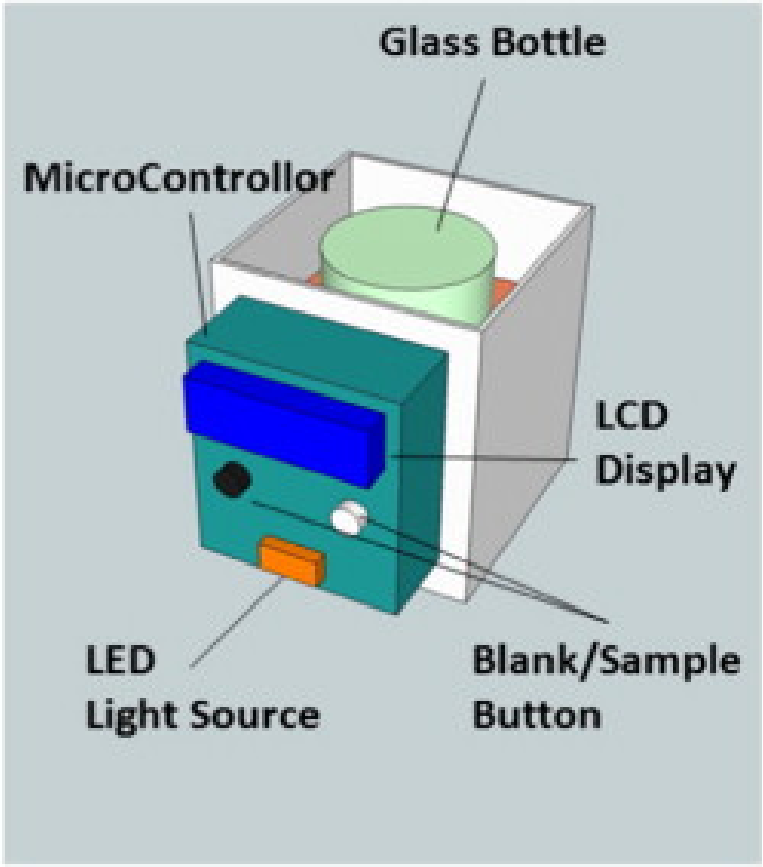


Arduino + LED's – cheap seawater pH sensor

Australian Government

Australian Institute of Marine Science





A proving ground for ReefTech

Australian Government

Australian Institute of Marine Science

- 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

Australian Government

Australian Institute of Marine Science