



# Measurement uncertainties in IMOS data streams

# Uncertainty & quality control

- QC flags
  - Good / Bad (/ Missing)
  - Interpretation: *Was the instrument operating as designed when it made this measurement?*
  - Use: ignore “bad” data in analysis
- Uncertainty
  - Interpretation: *How close to this measurement can we expect the “true value” to be?*
  - e.g. TEMP = 13.4 ± 0.1 C means we're 95% confident the temperature is between 13.3 and 13.5 C.
  - Use:
    - Provide a statistical weight to each measurement.
    - Propagate through calculations to derive uncertainty in final result.
    - Quantify how well independent measurements agree.
    - Quantify how well a model fits the data.

# Questions

- If we could provide meaningful uncertainty estimates for each measured value (at least for some parameters), would they be used?
- What information would help us estimate uncertainties?
  - Calibration details (from CSIRO calibration lab)
    - Date
    - Coefficients
    - Calibration uncertainty
    - Drift rate (from repeat calibrations)
  - Deployment details (from field staff)
    - Instrument status on recovery (fouling, etc...)
    - Pre-/post-deployment checks?
  - Sensor behaviour (past experience, further research?)
    - Sensor response time
    - Influence of environment

# Questions

- Where in the workflow can we calculate and report uncertainties?
  - Incorporate into Matlab Toolbox (need all required info in deployment database).
  - Centrally at eMII (obtain cal info directly from cal labs; *need sensor s/n and deployment info from field staff*)