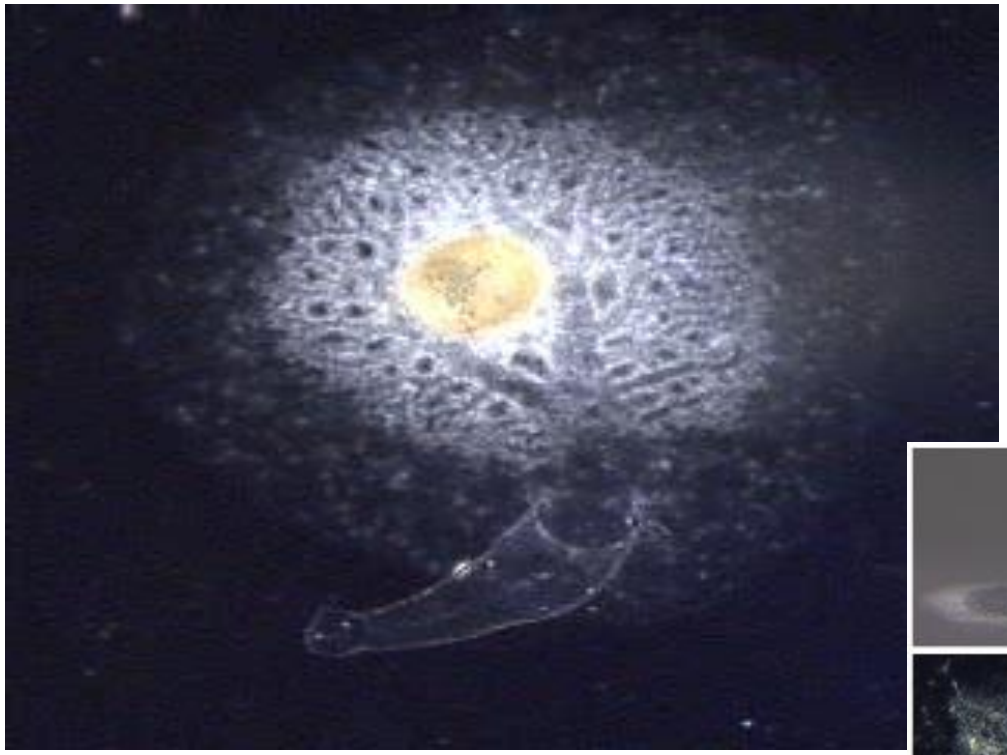
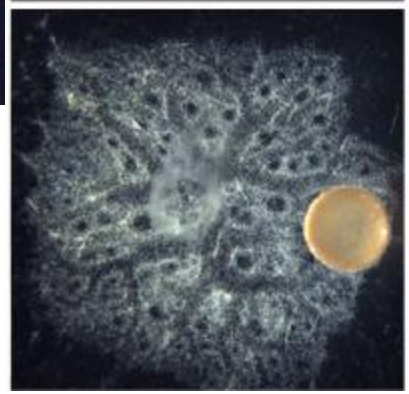
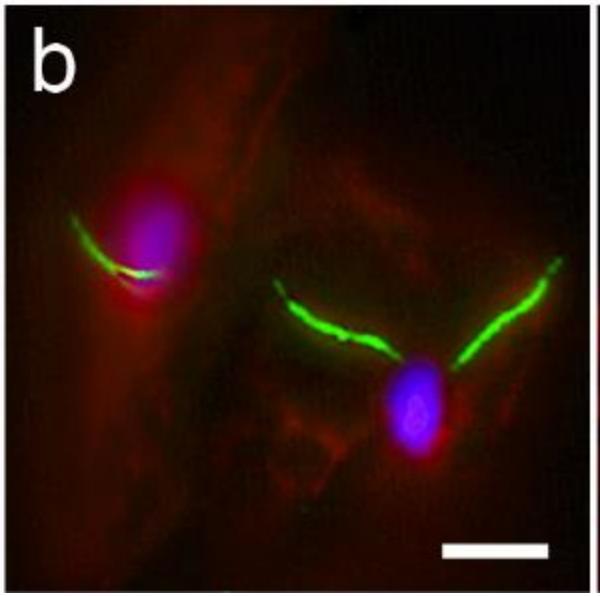
Behaviour of a sponge in response to changes in ocean properties over time and in 3D

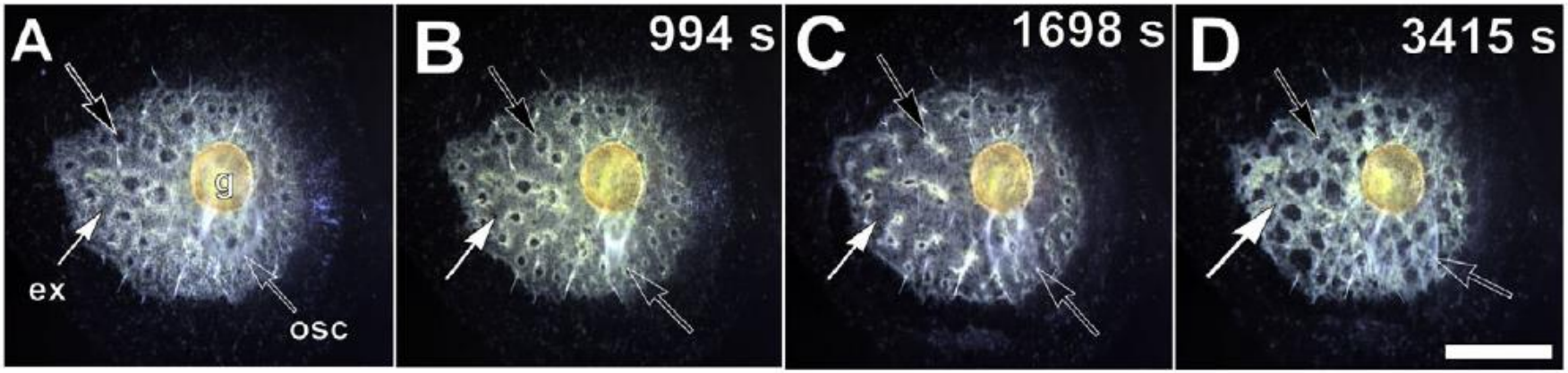


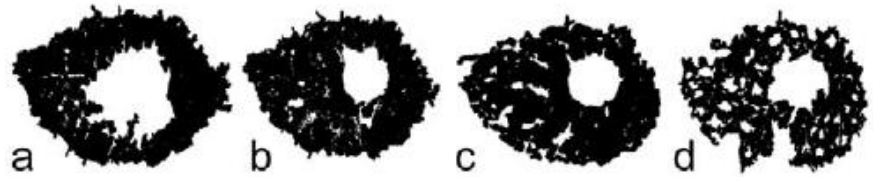
Sally Leys
Laura Hamonic
University of Alberta

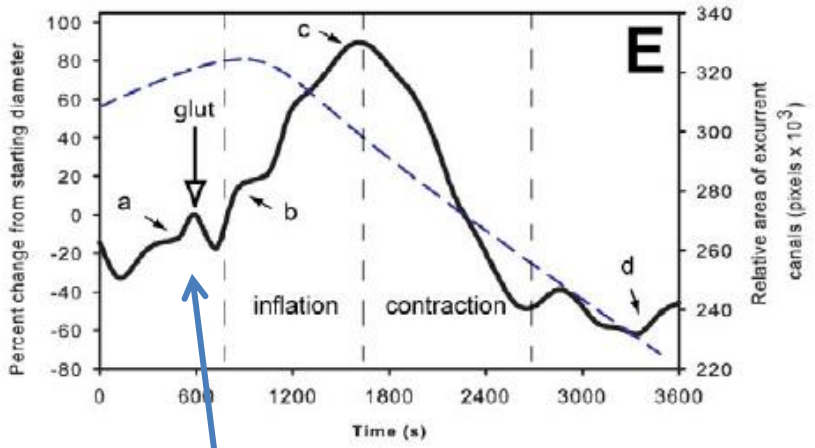




Quantifying behaviour







Thresholding – change in area

Diameter of feeding canals

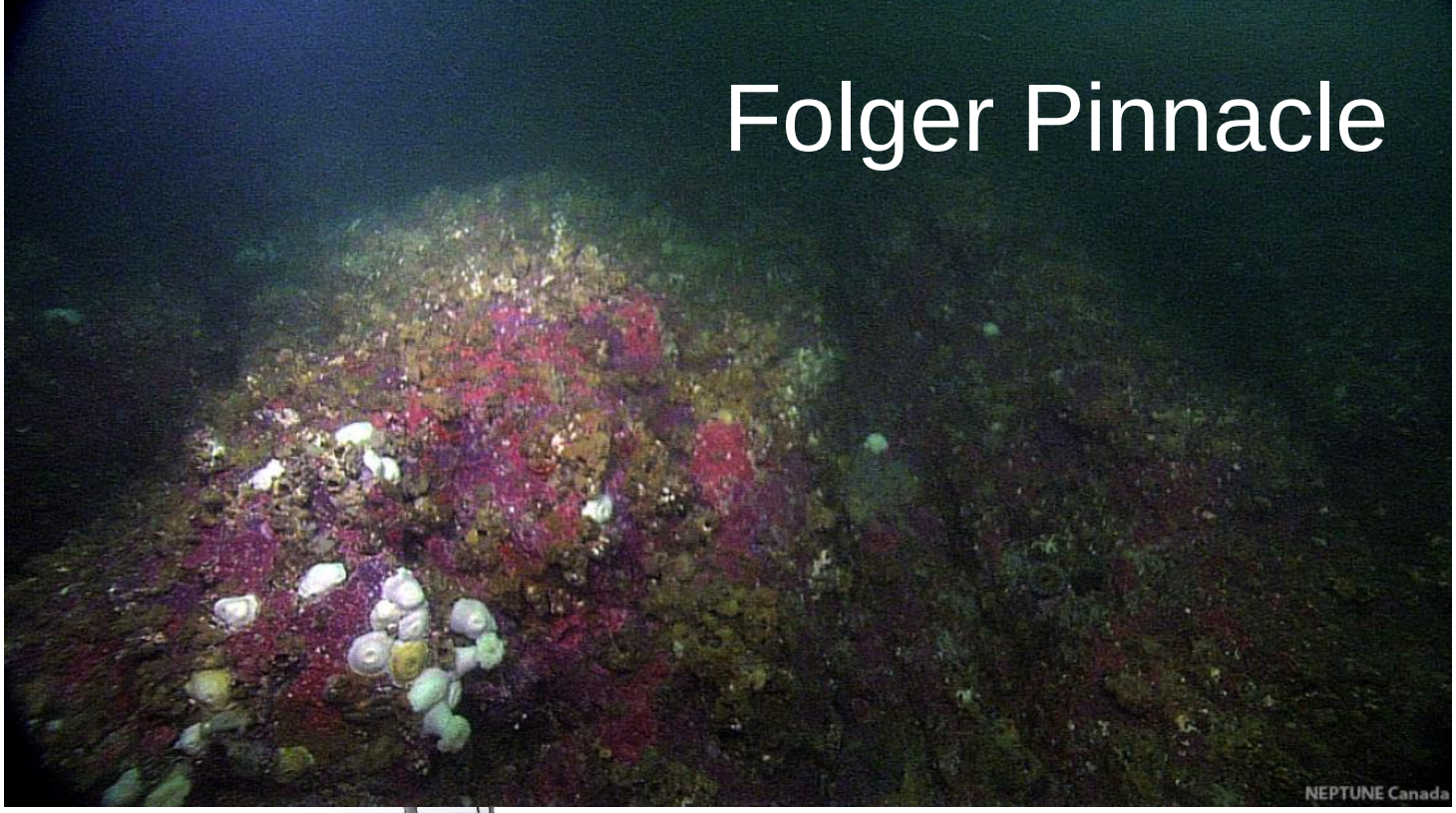
Glutamate

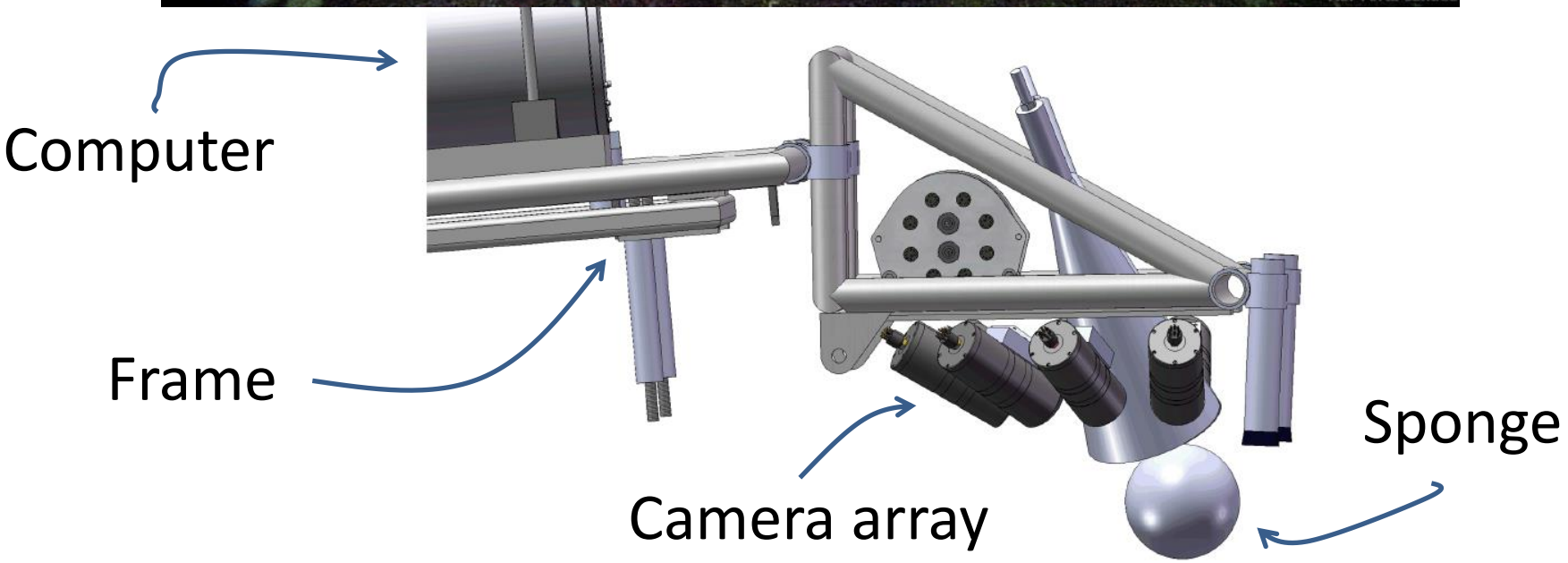
What do sponges respond to in the environment?...

How can you measure behaviour in situ?



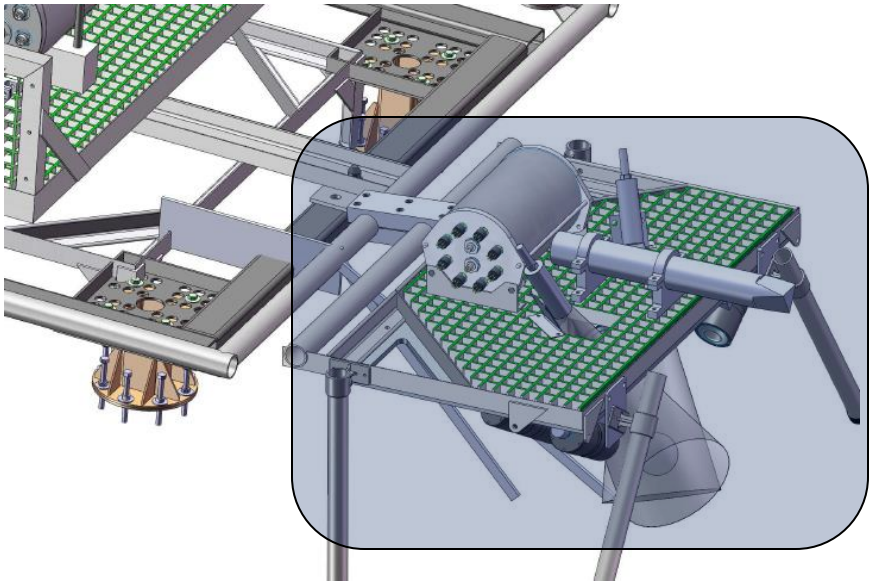


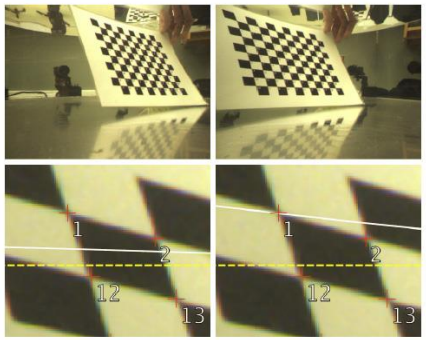


Folger Pinnacle
NEPTUNE Canada

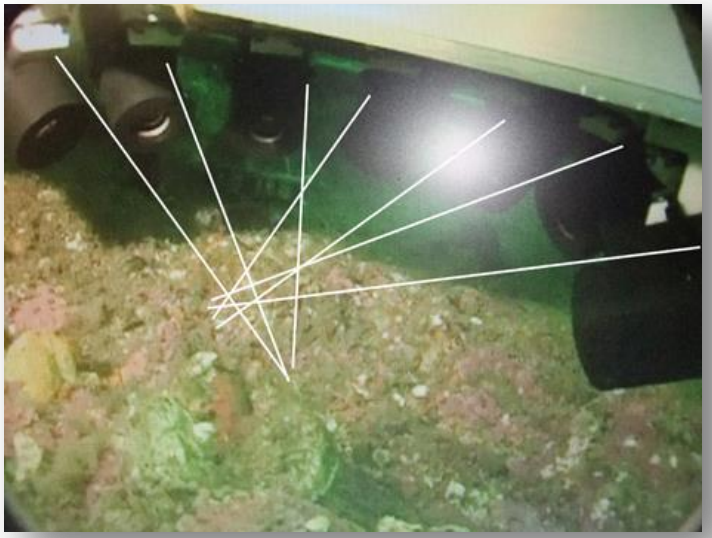

Computer
Frame
Camera array
Sponge

Imaging in 3D, Underwater

Herbert Yang, Computing Science U Alberta
Jason Gedge, Timothy Yau

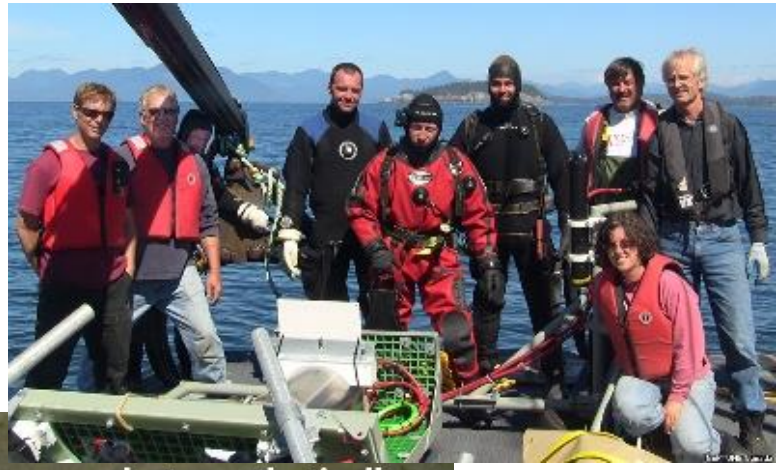


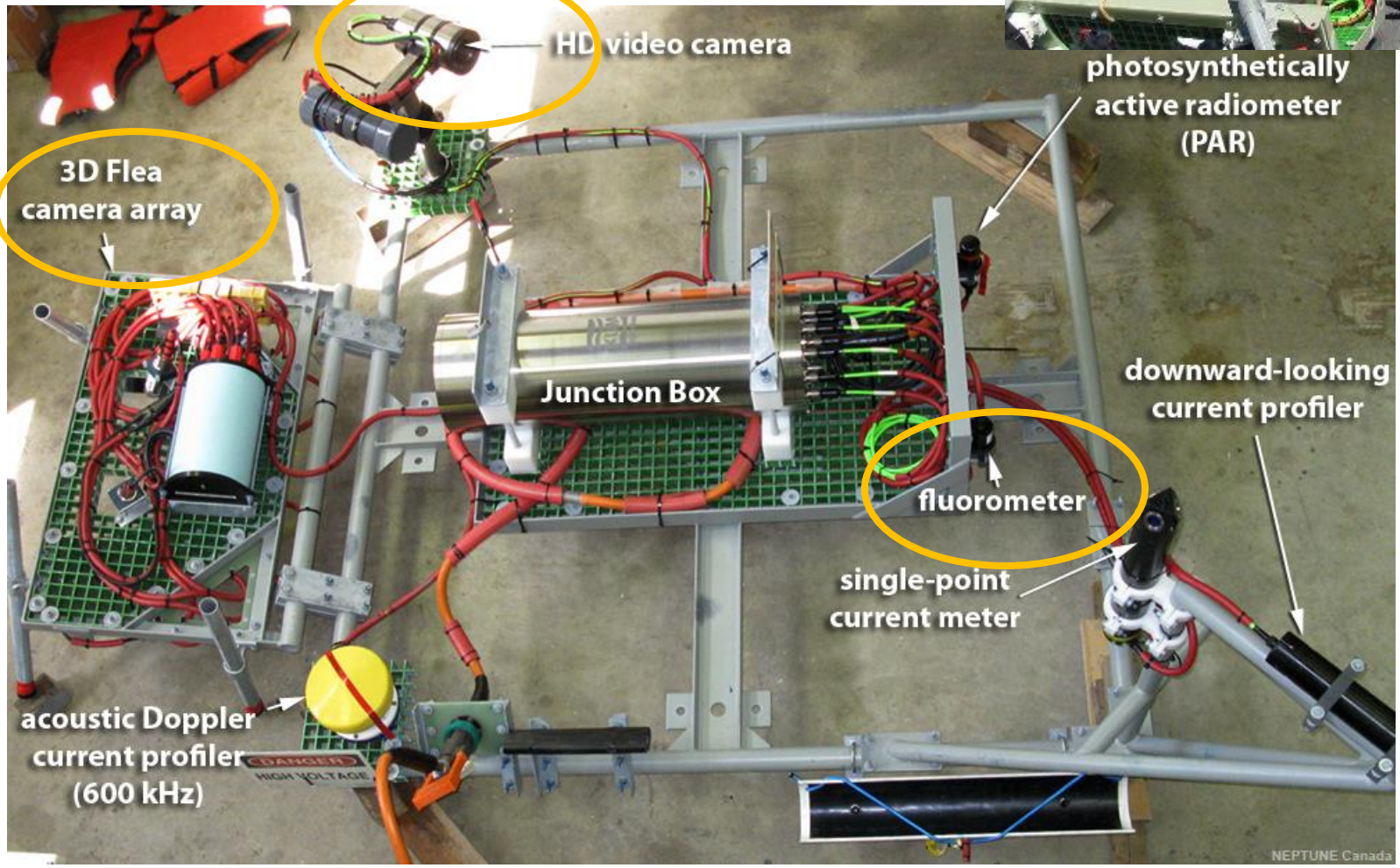




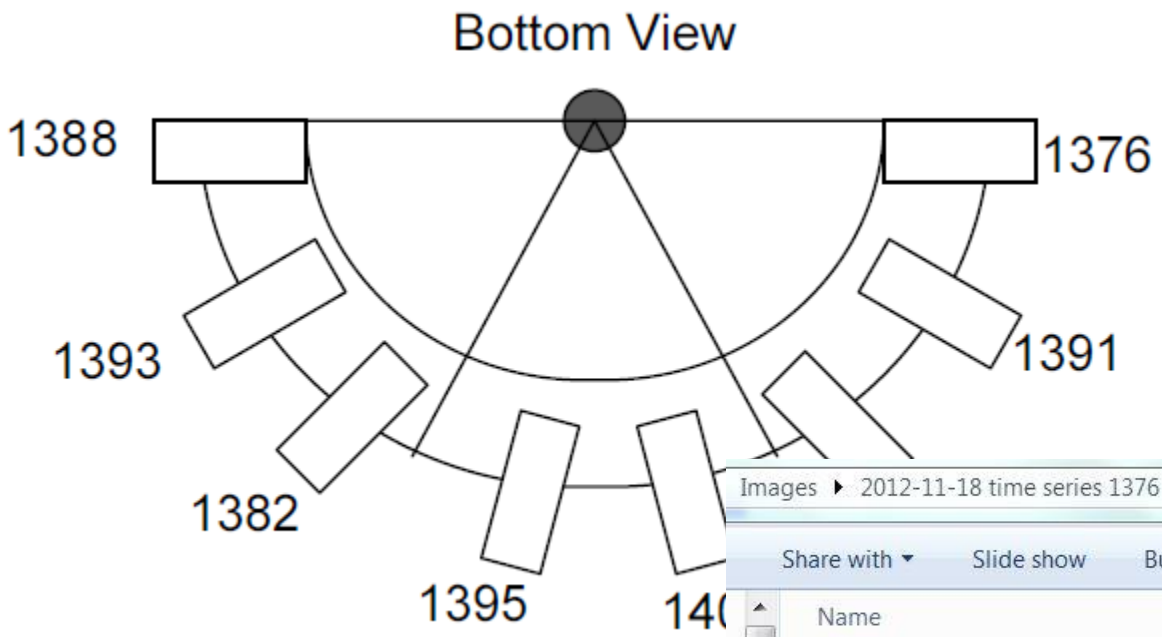
Folger Pinnacle Instrument Platform

Active Early Spring 2011





Positioning the camera



library ▾ Share with ▾ Slide show »

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GRASSHOPPER_3DCAM_01_20121206T005955.806Z-BMP
GRASSHOPPER_3DCAM_01_20121207T005946.131Z-BMP
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Images ▸ 2012-11-18 time series 1376 ▸ 1376_Nov11

Share with ▾ Slide show Burn New folder

Name

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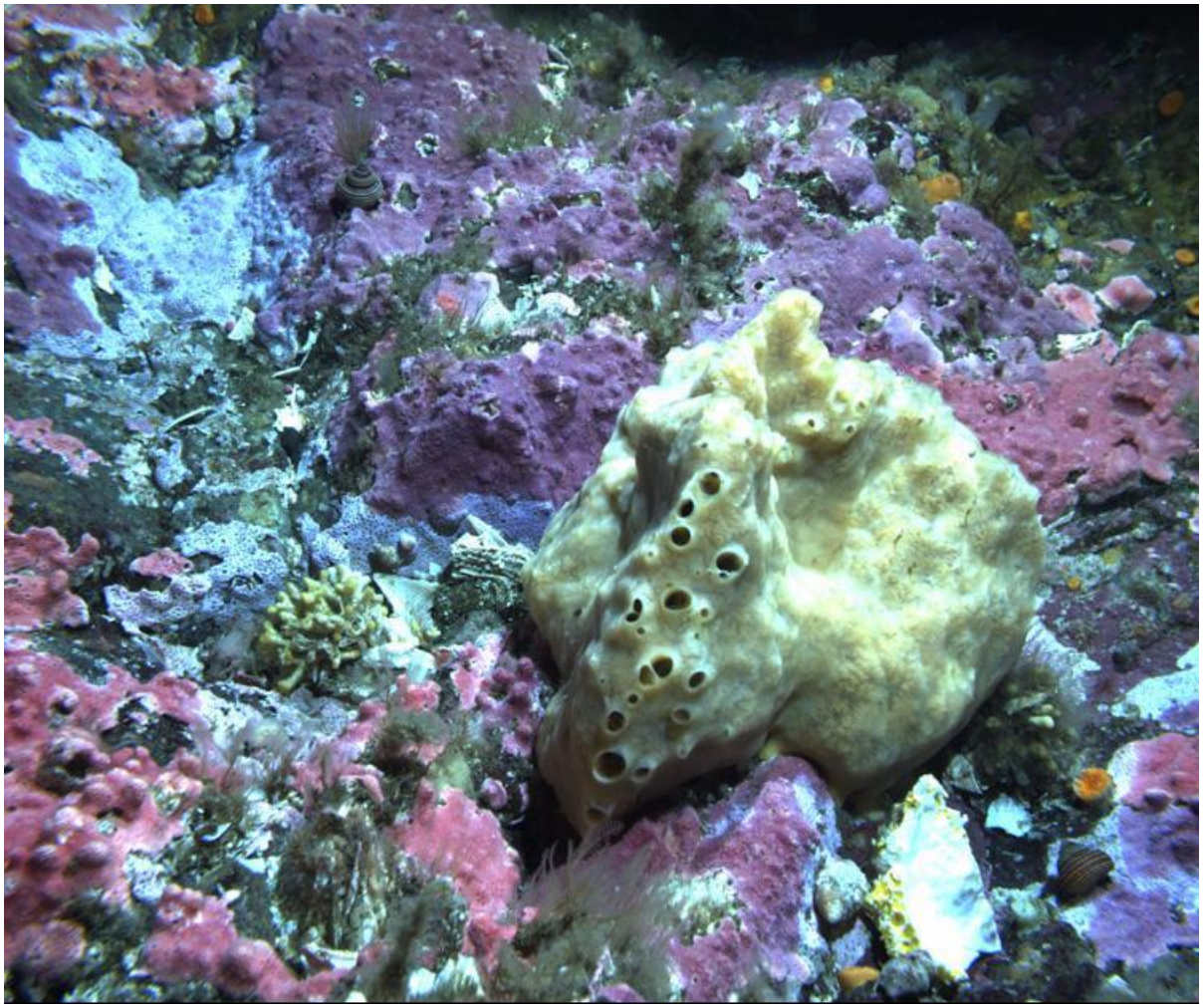
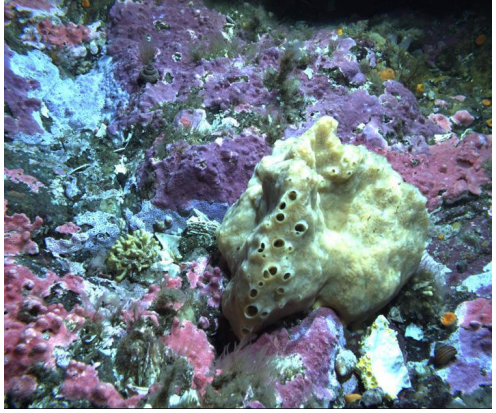
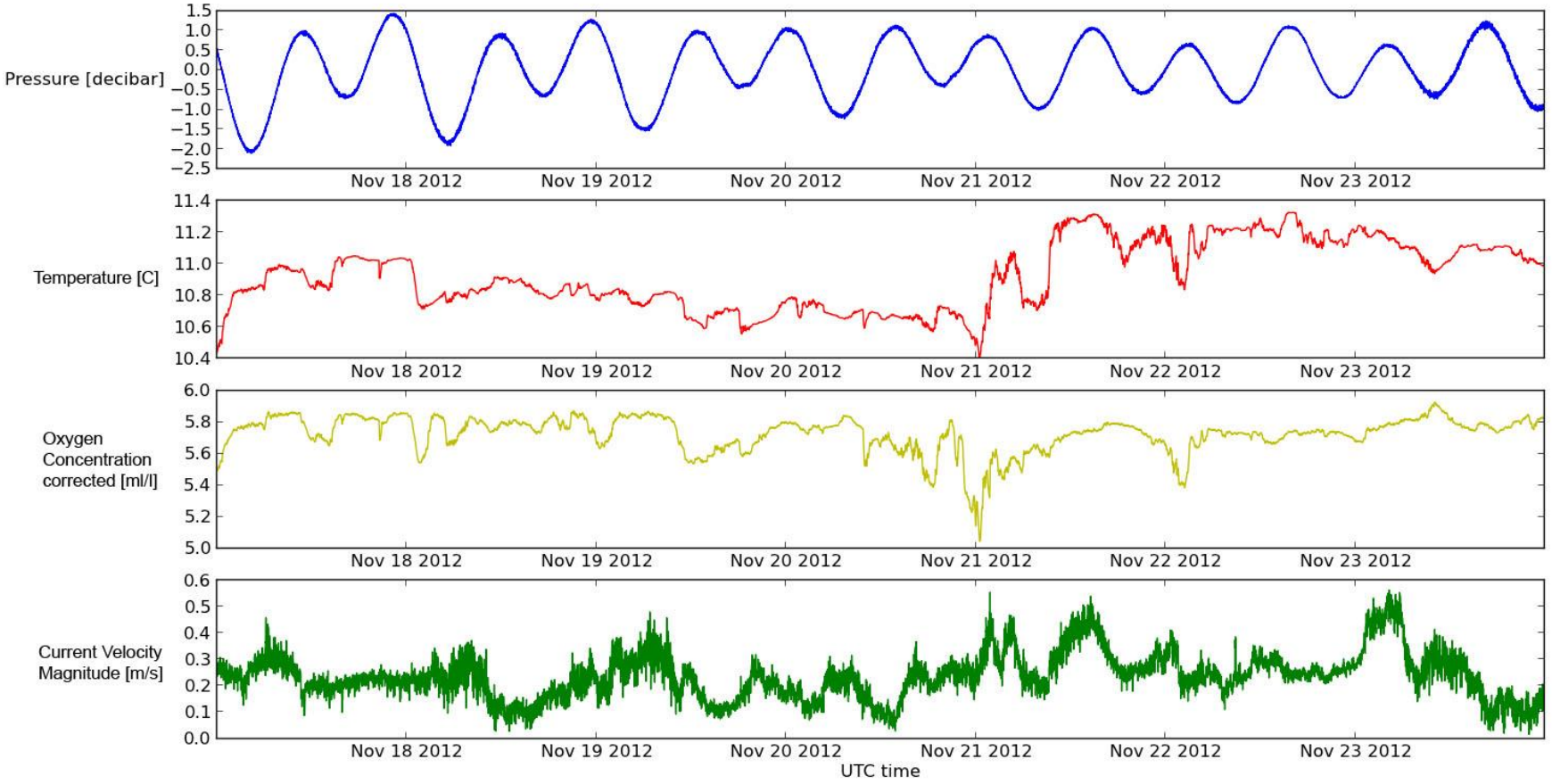
November 18, 2012 – 16 minutes
12 midnight to 00:16

Nov 9 – Dec 20: 42 days
One image each day



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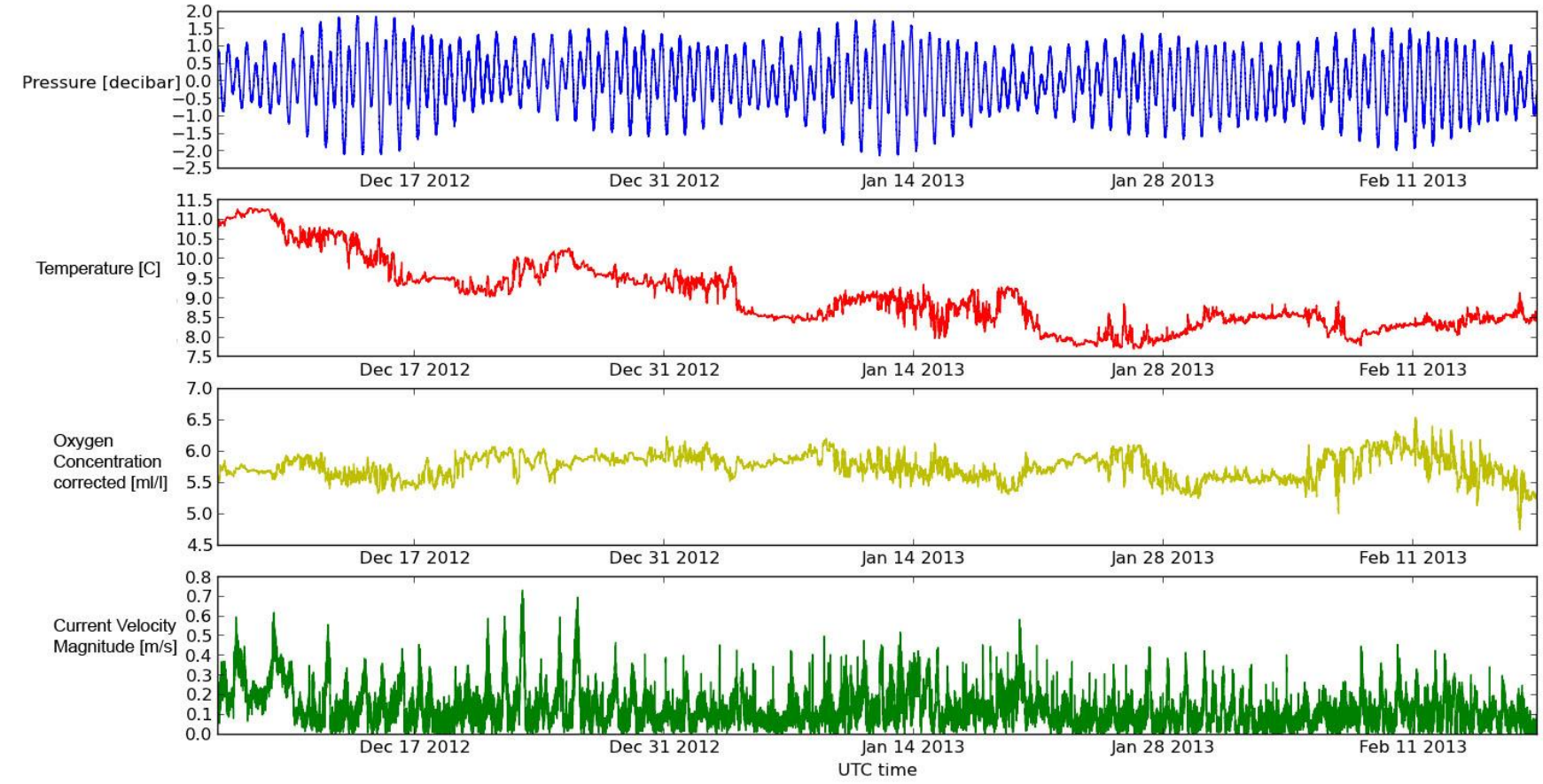
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
−2.0
−2.5
Nov 18 2012
Nov 19 2012
Nov 20 2012
Nov 21 2012
Nov 22 2012
Nov 23 2012
Temperature [C]
11.4
11.2
11.0
10.8
10.6
10.4
Oxygen Concentration corrected [ml/l]
6.0
5.8
5.6
5.4
5.2
5.0
Current Velocity Magnitude [m/s]
0.6
0.5
0.4
0.3
0.2
0.1
0.0
UTC time


Jan 27_2013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Dec 17 2012
Dec 31 2012
Jan 14 2013
Jan 28 2013
Feb 11 2013
Temperature [C]
11.5
11.0
10.5
10.0
9.5
9.0
8.5
8.0
7.5
Dec 17 2012
Dec 31 2012
Jan 14 2013
Jan 28 2013
Feb 11 2013
Oxygen Concentration corrected [ml/l]
7.0
6.5
6.0
5.5
5.0
4.5
Dec 17 2012
Dec 31 2012
Jan 14 2013
Jan 28 2013
Feb 11 2013
Current Velocity Magnitude [m/s]
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
Dec 17 2012
Dec 31 2012
Jan 14 2013
Jan 28 2013
Feb 11 2013
UTC time

Goals

Short term:

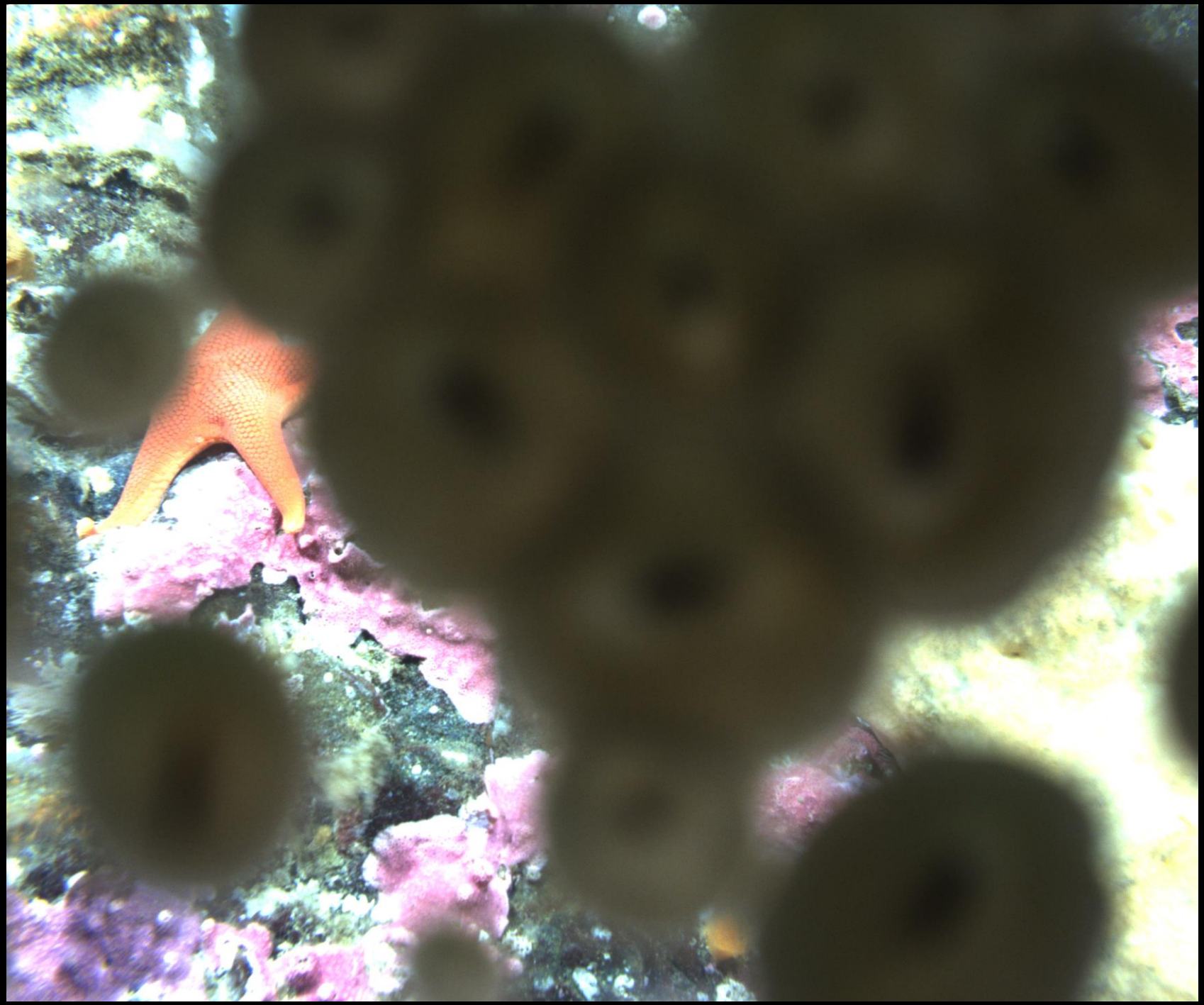
1. Quantify shape changes
   Within 2hrs, days to weeks, growth over months
2. Correlate changes in shape to events in the water column:
   Temperature, Pressure, Oxygen, Flow, Light
3. Determine volume change over time.

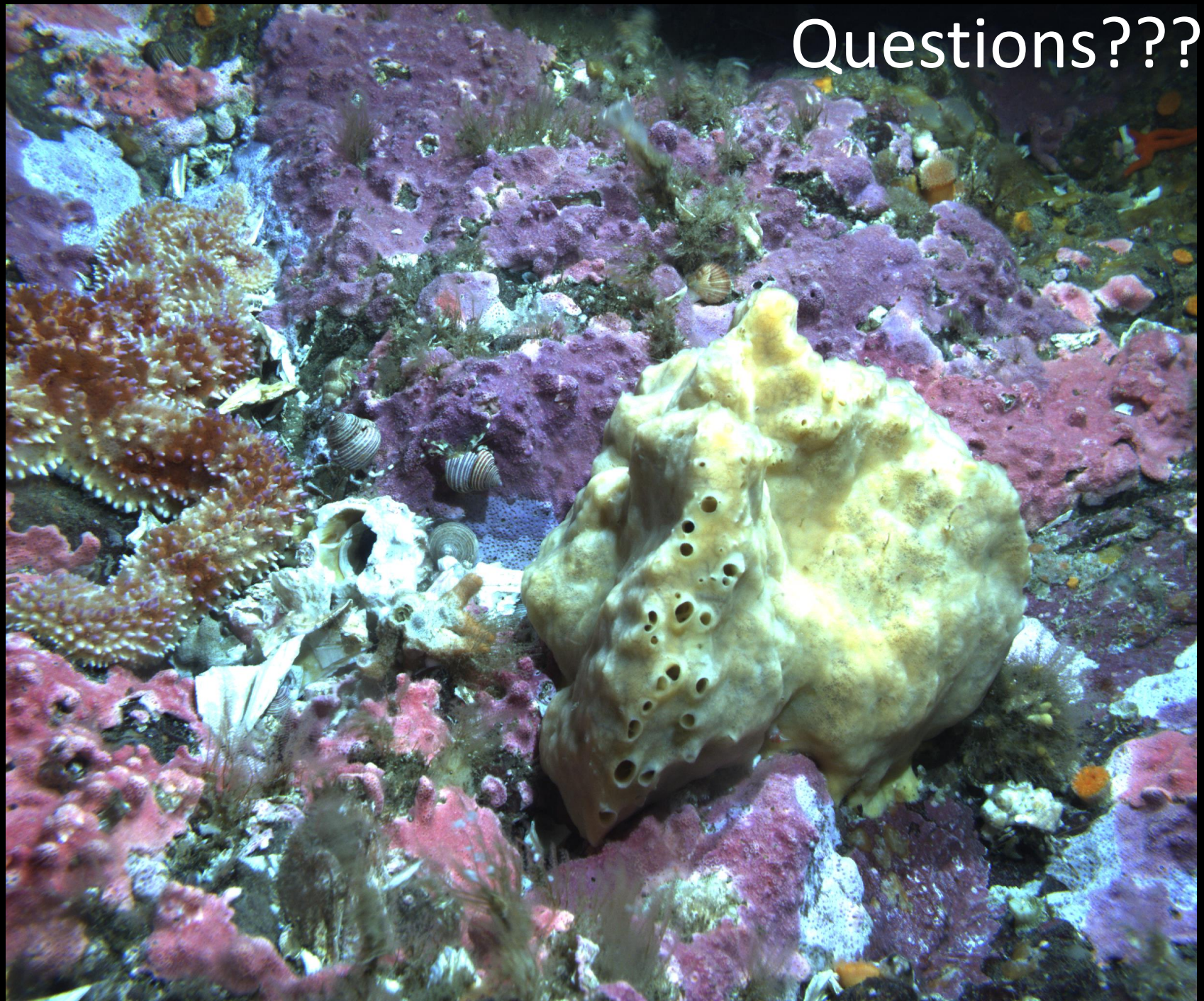
Longer term:

1. Monitor behaviour in response to internal waves, possibly Tsunamis, surface waves
2. Do this via citizen science
   - Generate a ‘test’ package of scripts
3. Make scripts for interactive videos “at a ‘click’”

Challenges:

- Downloading image files
  - Is a preview possible?
  - What format?
  - Links to different cameras on Oceans 2.0?
- Downloading data files – scripts for collecting, plotting (use of matlab or python… tutorials)
- Data gaps in particular instruments (e.g. transmissometer)
- Corruption of images upon unzip…?




Questions???