Wave Energy Research Centre

College of the North Atlantic

Making Land-based Aquaculture a Viable "Outport" Industry

Mining hidden gems, raising ugly ducklings & riding the white elephant

Michael Graham

Local Prosperity 2015

NSERC CRSNG / People. Discovery. Innovation.

RDC Research & Development Corporation Newfoundland and Labrador — a catalyst for growth

Harbour Authority of Lord's Cove

Fisheries and Oceans Canada / Pêches et Océans Canada

Ocean Choice

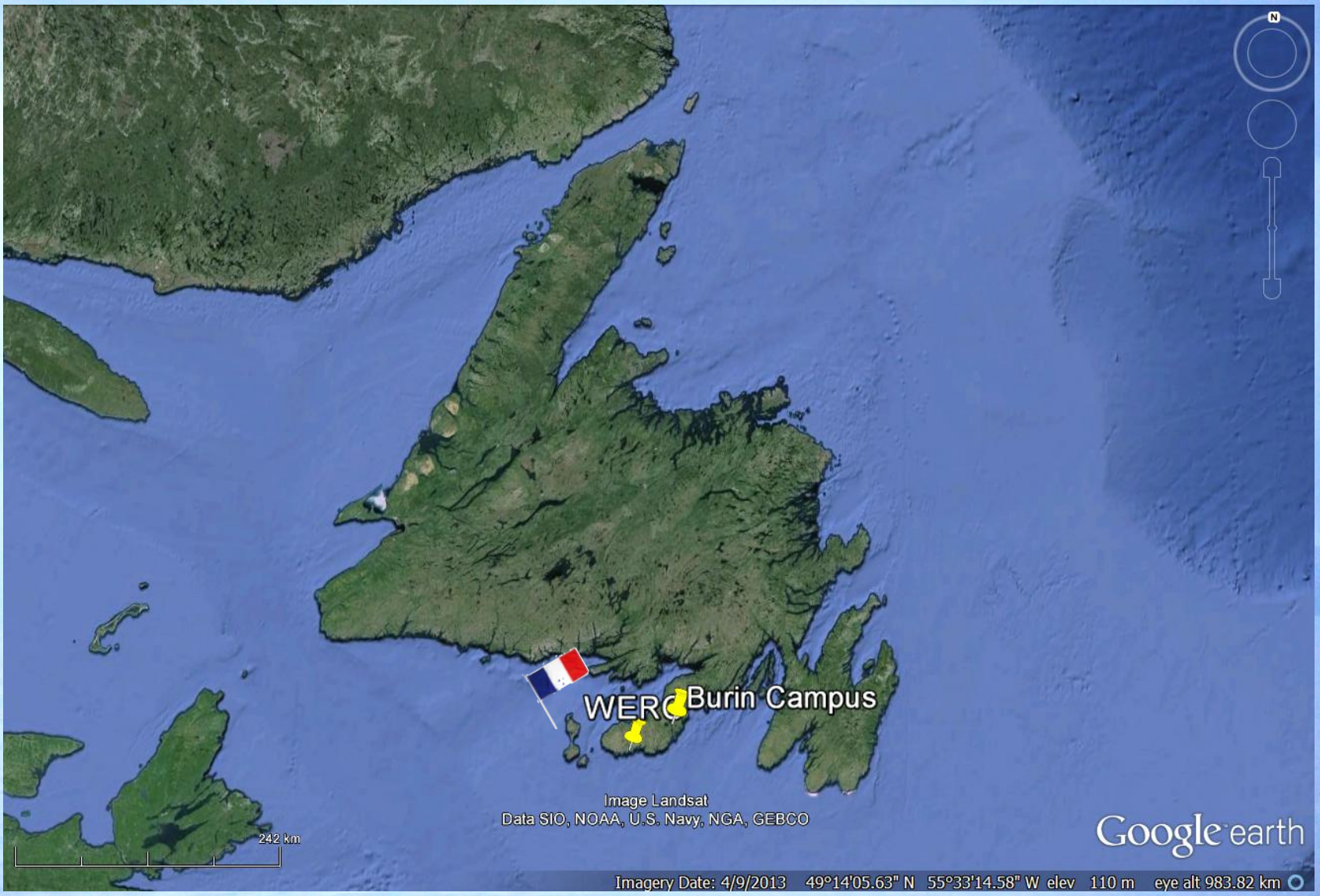
Town of Lord's Cove

Newfoundland Labrador Canada

Department of **Business, Tourism, Culture and Rural Development**

Atlantic Canada Opportunities Agency / Agence de promotion économique du Canada atlantique

National Research Council Canada / Conseil national de recherches Canada


WERC
Burin Campus
Image Landsat
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
242 km
Google earth
Imagery Date: 4/9/2013 49°14'05.63" N 55°33'14.58" W elev 110 m eye alt 983.82 km

Setting the scene….

St. Bride's 1985

Setting the scene….

Lord's Cove 2010

Aquaculture an obvious answer…..

But….

- Lack of sea sites (depth, waves etc.)
- Expensive pumping required for land –based
- Land based becomes point source of organic pollution
- Max production requires heat in winter

So…..

- Go on land?
- Find inexpensive way to move water to shore – Waves?
- Find a way to turn poo into profit…..multi-trophic aquaculture?
- Anaerobic digestion (methane production from farm waste)????

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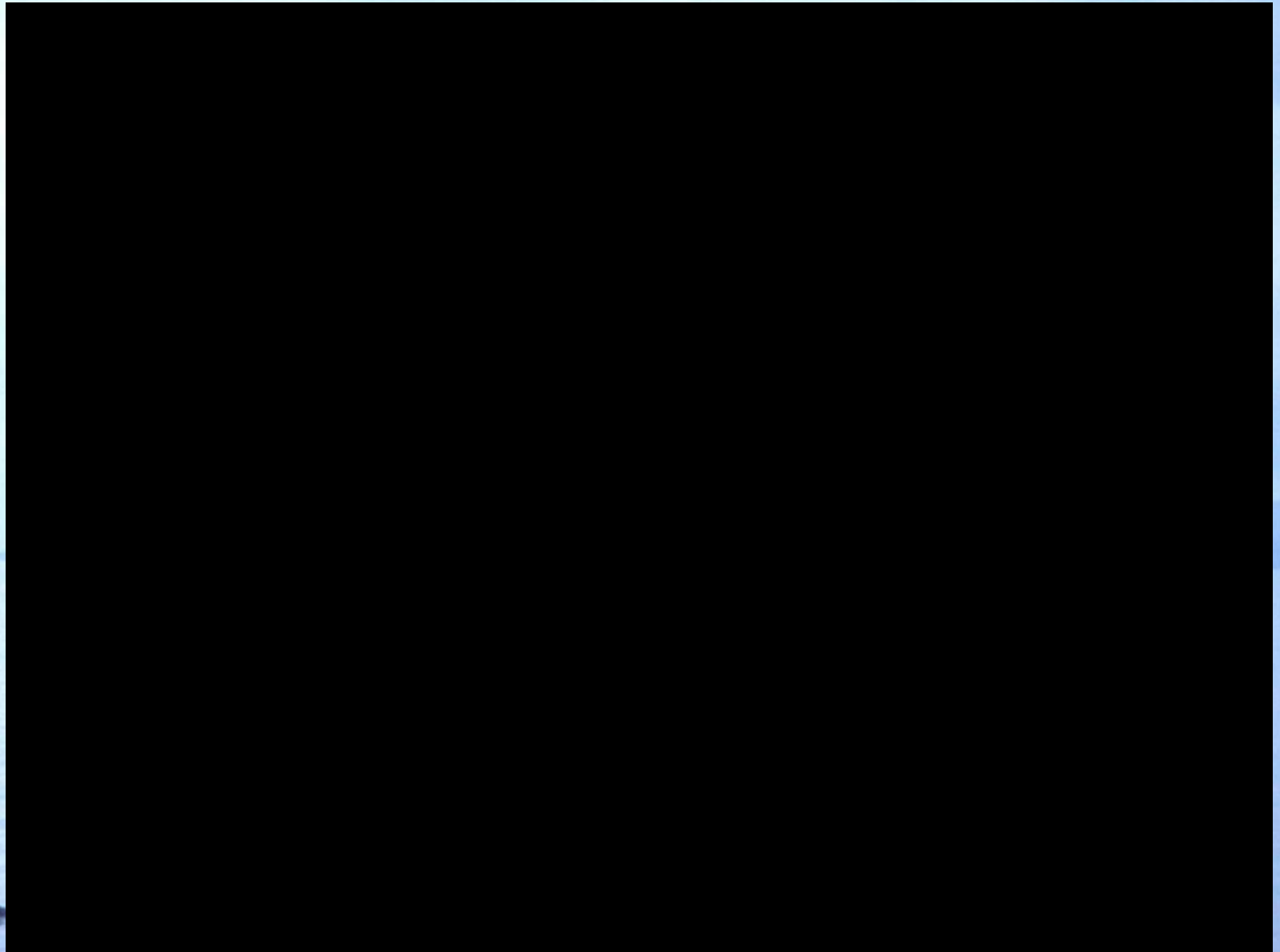
Remember….

It IS the North Atlantic….



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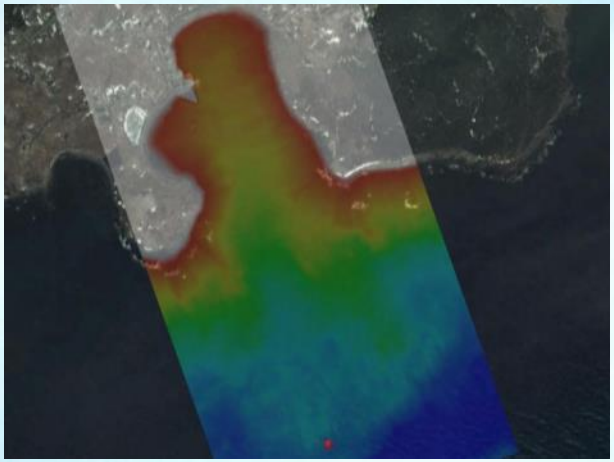
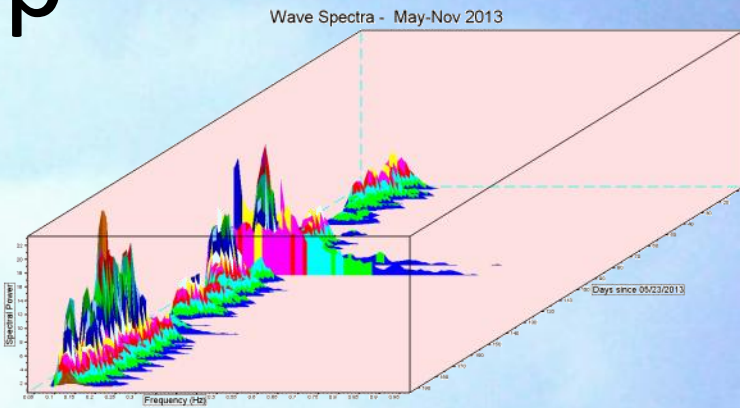
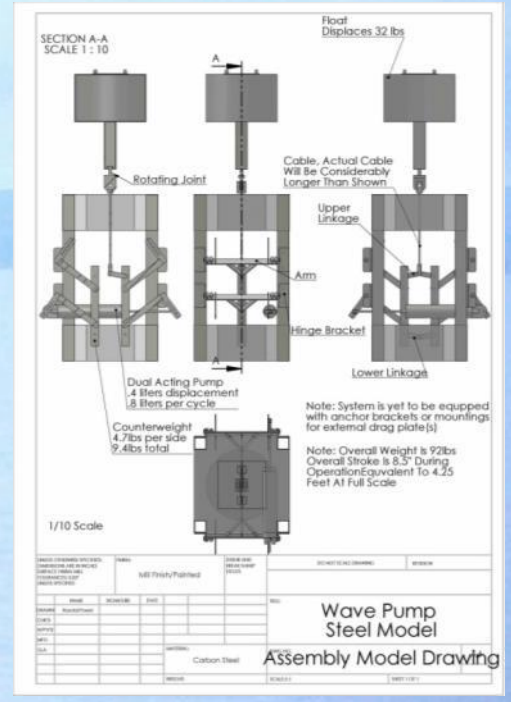
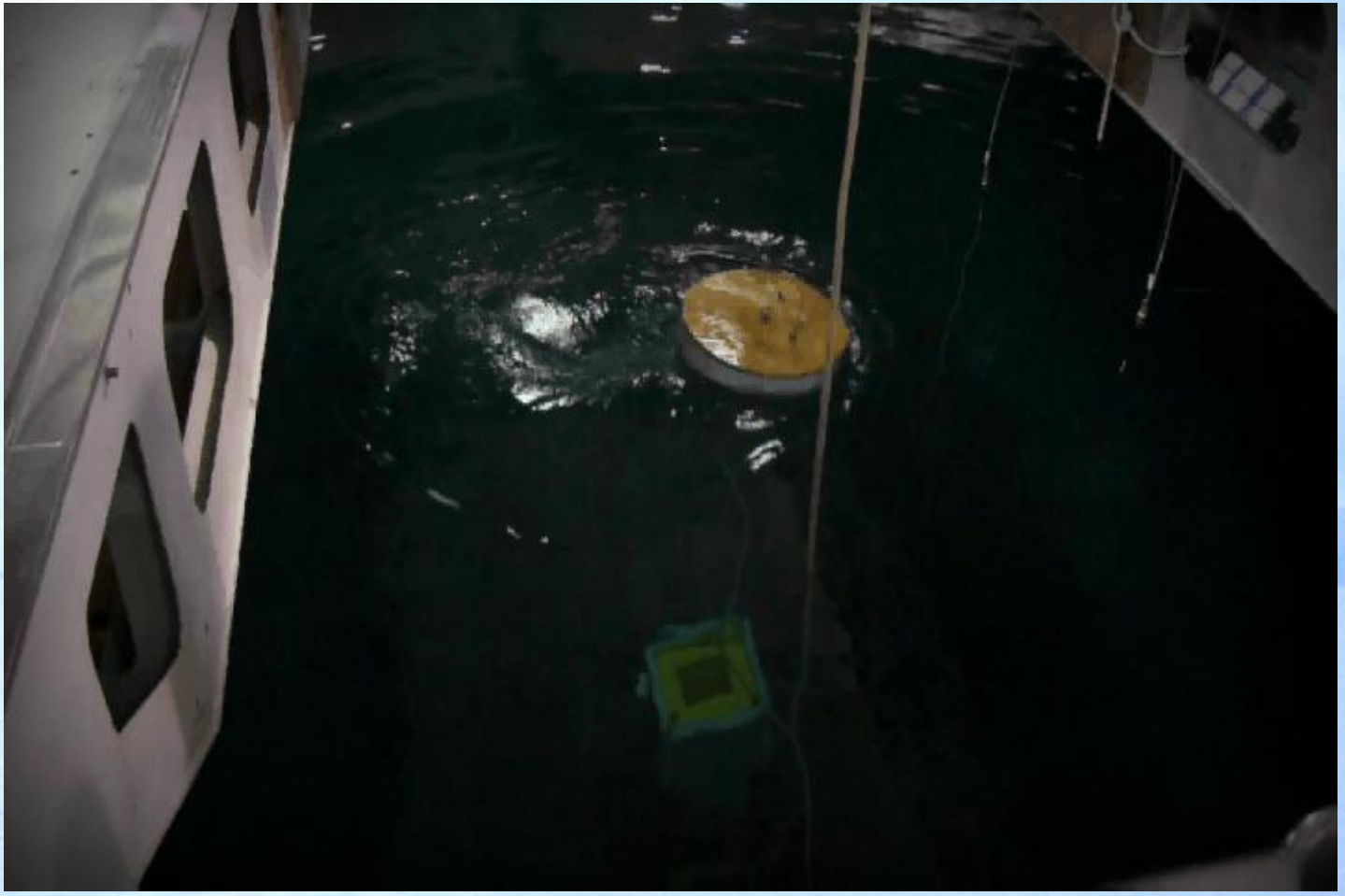
Wave Pump



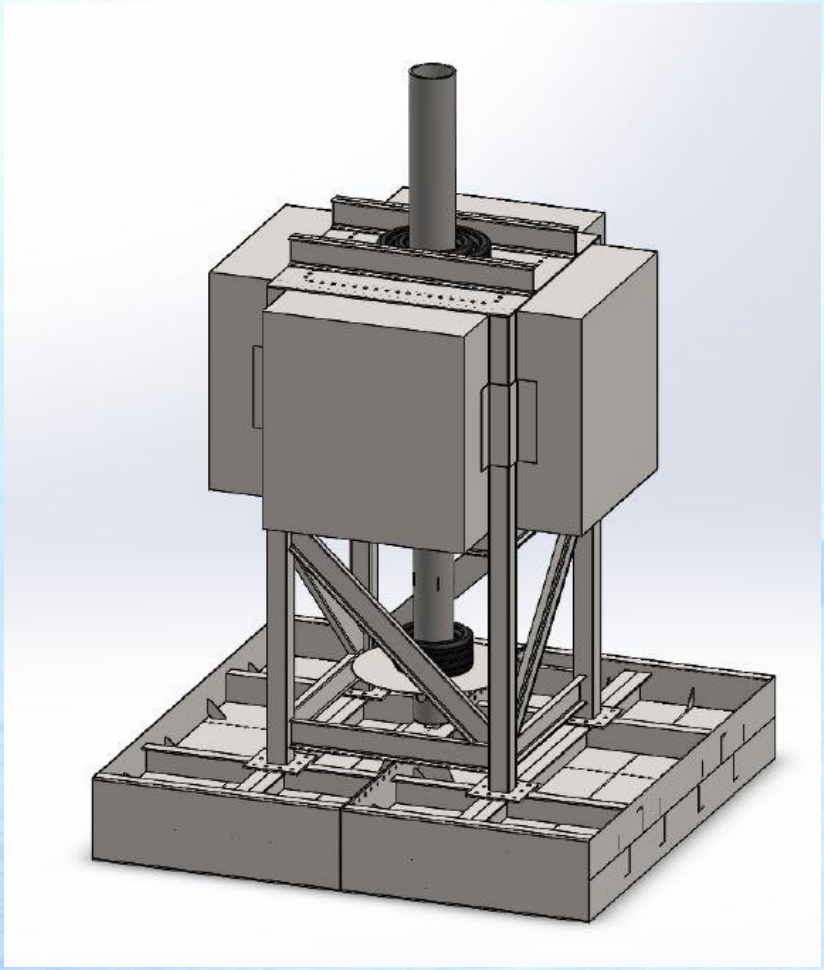




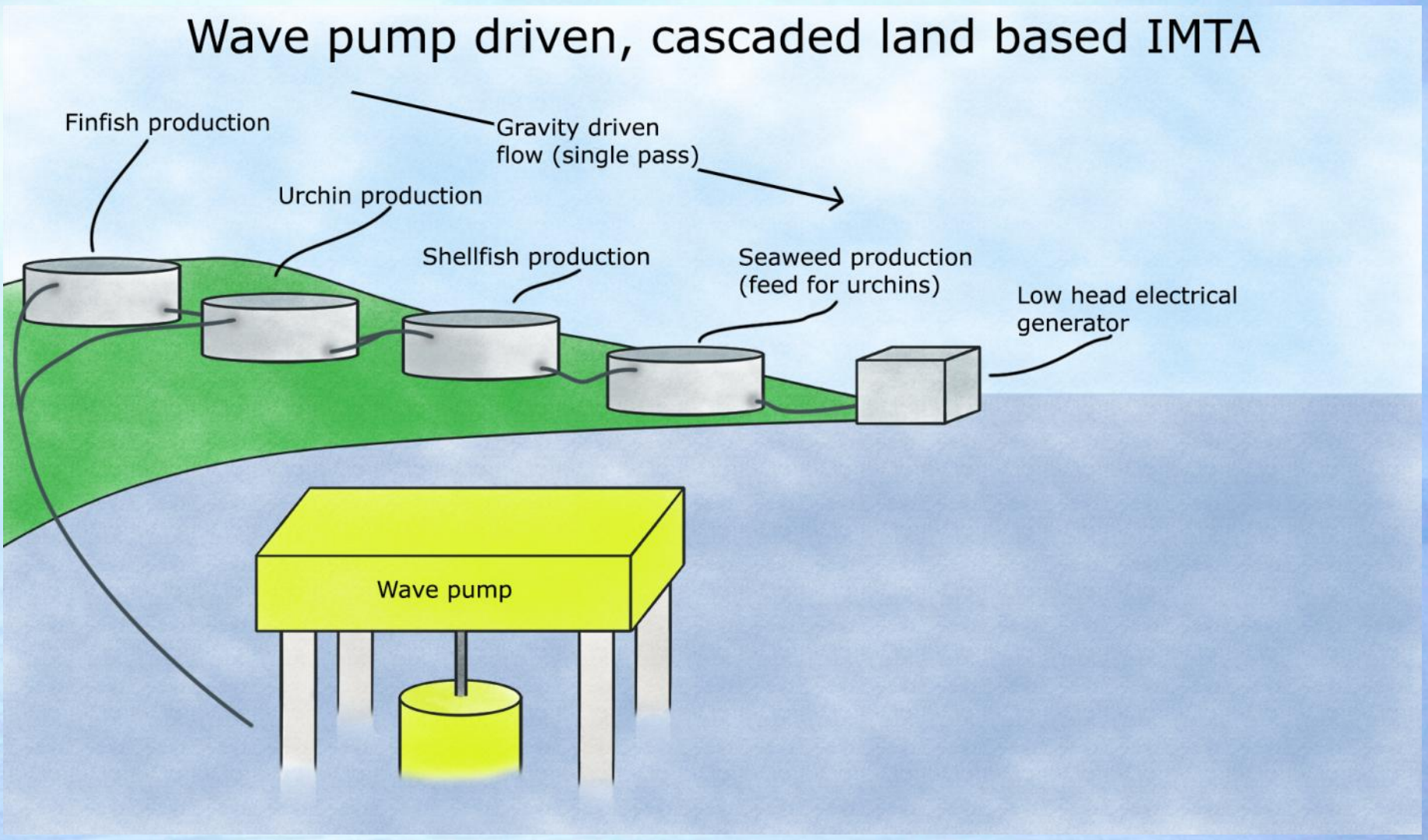
The Pump

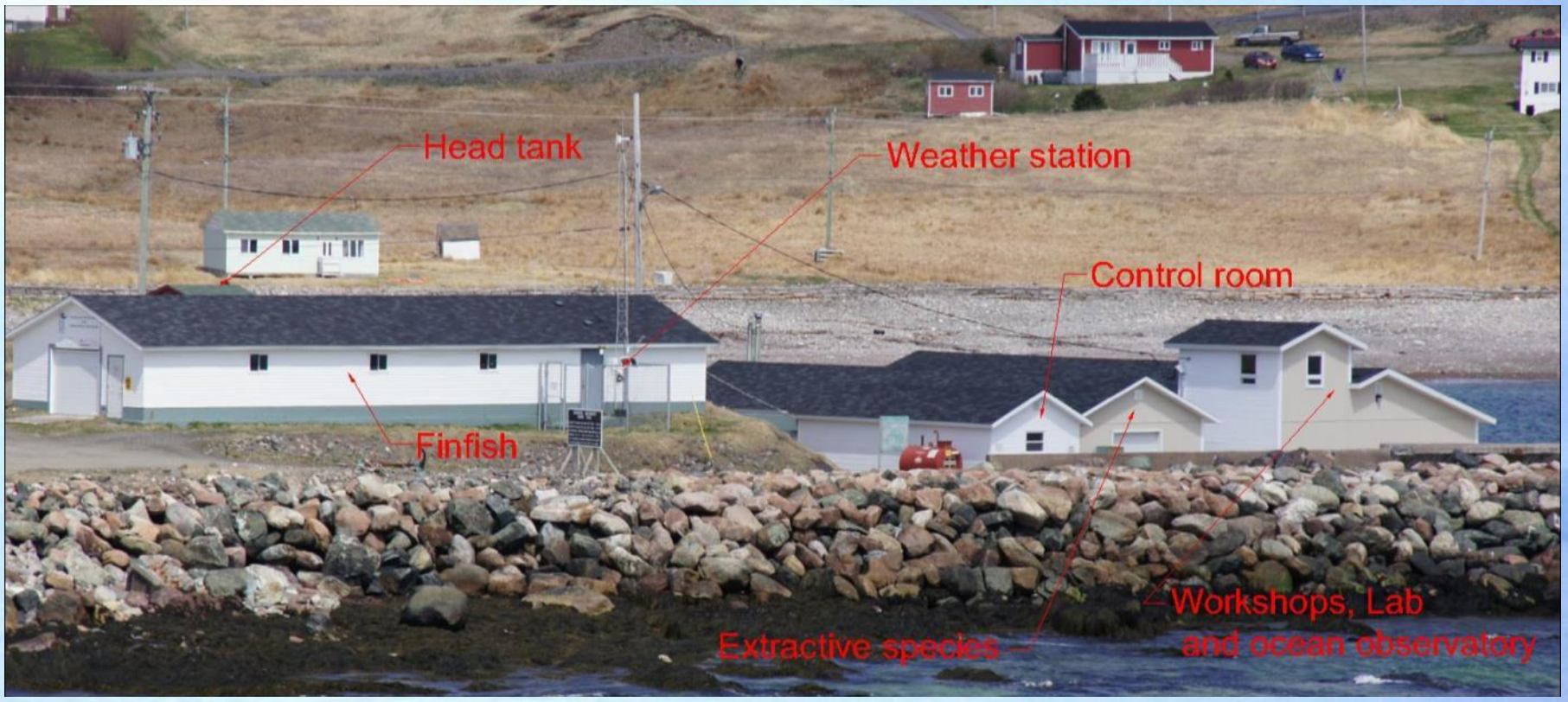


The Pump



The Farm


Wave pump driven, cascaded land based IMTA
Finfish production
Gravity driven flow (single pass)
Urchin production
Shellfish production
Seaweed production (feed for urchins)
Low head electrical generator
Wave pump


Head tank
Weather station
Control room
Finfish
Workshops, Lab
and ocean observatory
Extractive species

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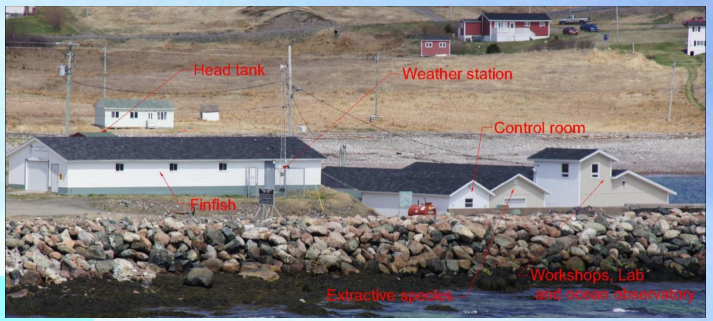
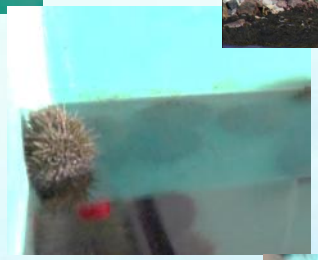
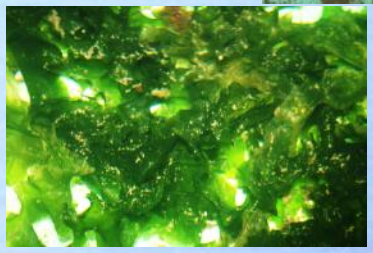
The Farm







So Far……

- All organisms growing & healthy
  - Only finfish are “fed”
- Water Flow problems during storms (clogged filters)
- Ocean temperature extremes
  - Winter temperatures down to -1.5^{o}C
  - Late August Temperatures up to 20.5^{o}C
- Abundance of nutrition for extractive organisms

Spin-offs & economics

- Ocean observatory & engineering test centre
- Land-based aquaculture research facility
  - Maximize feed conversion
  - Energy efficiency
  - Commercialization of underutilized species
- Land-based IMTA:
  - Works biologically
  - Still research required to prove the economics

A final word…..

Always remember what an ugly duckling can become…….