

# Routine Monitoring in support of WFD and ensuing demands on a FerryBox System in Scottish Coastal Waters

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## 4<sup>th</sup> Ferrybox Workshop 2011 -

### FerryBoxes as Part of Operational Observation Networks: Monitoring versus Scientific Aspects

1. SEPA, Marine Science, WFD
2. Current Monitoring Network
3. Maintenance and QA/QC
4. SEPA FerryBox
5. Comparison
6. Future

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# Scottish Environment Protection Agency

SEPA's main role is to protect the environment and human health. We do this by regulating activities that can cause pollution and by **monitoring** the quality of Scotland's air, land and water.

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## Marine Science

Primary Marine Science section is setting Scotland's estuaries and coastal nautical mile baseline.

section is composed of ecologists, chemists, morphologists, modellers and the

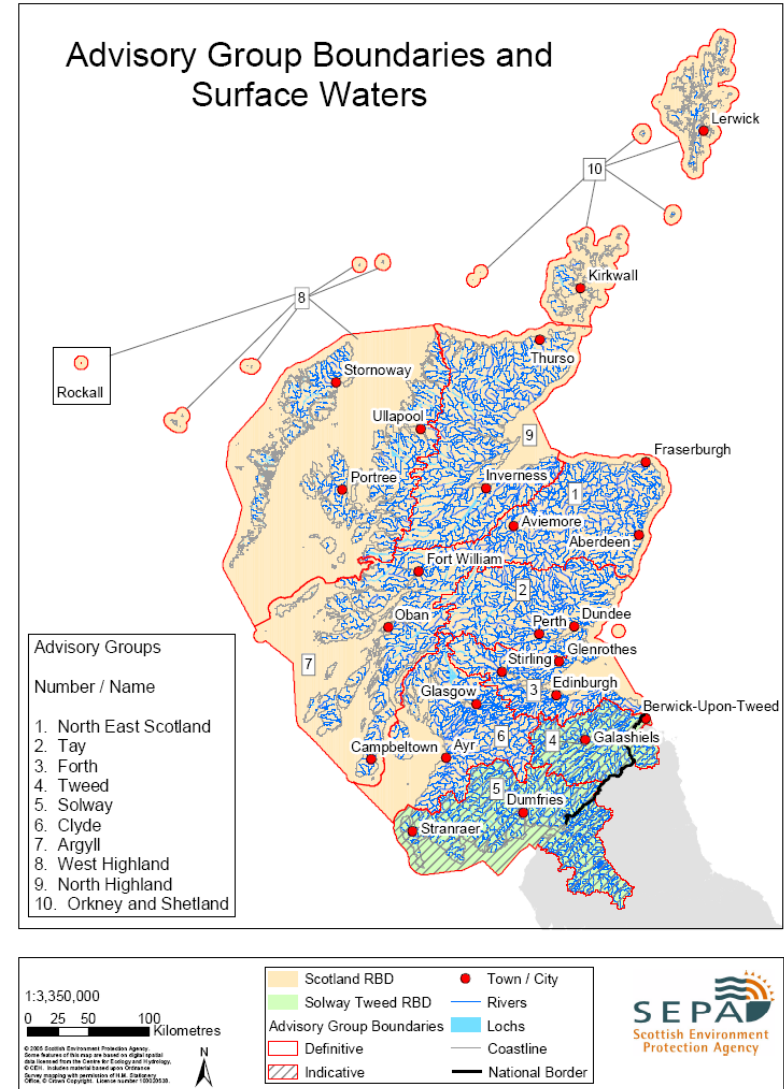
SEPA, the Scottish Government, other customers with an integrated advisory service.

the Ecology Unit  
the Chemistry Unit  
and the Met Unit



## Water Framework Directive

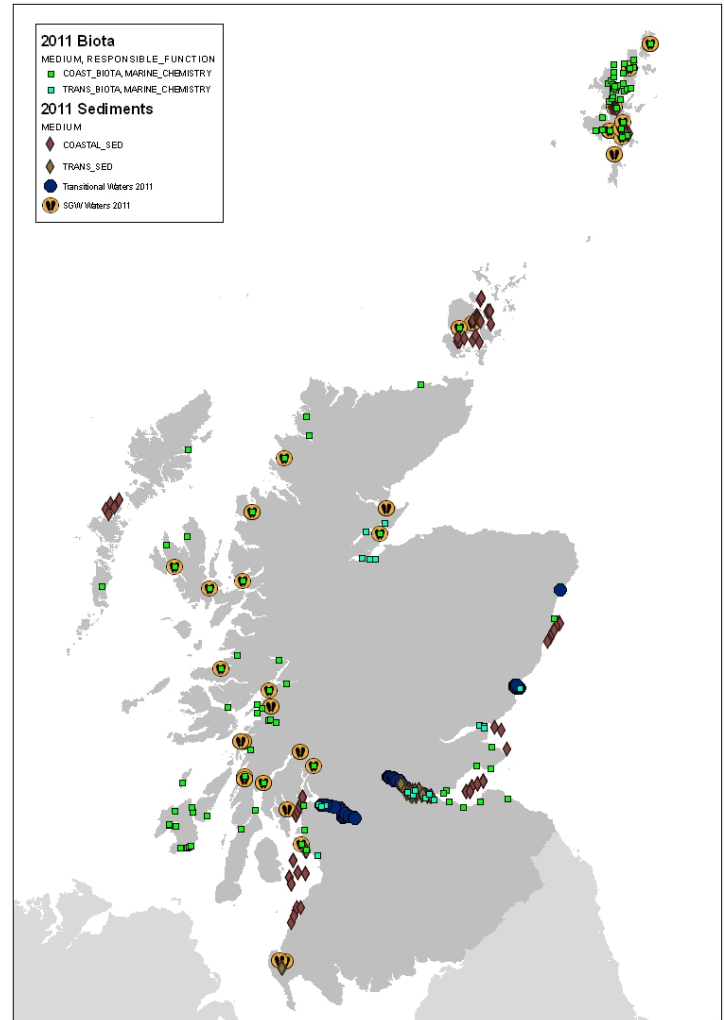
- River Basement Plans
- River Catchments → Coastal Waters
- SEPA is CMA
- Eutrophication
- Data Submission to MERMAN (BODC) and ICES
- MSFD, OSPAR



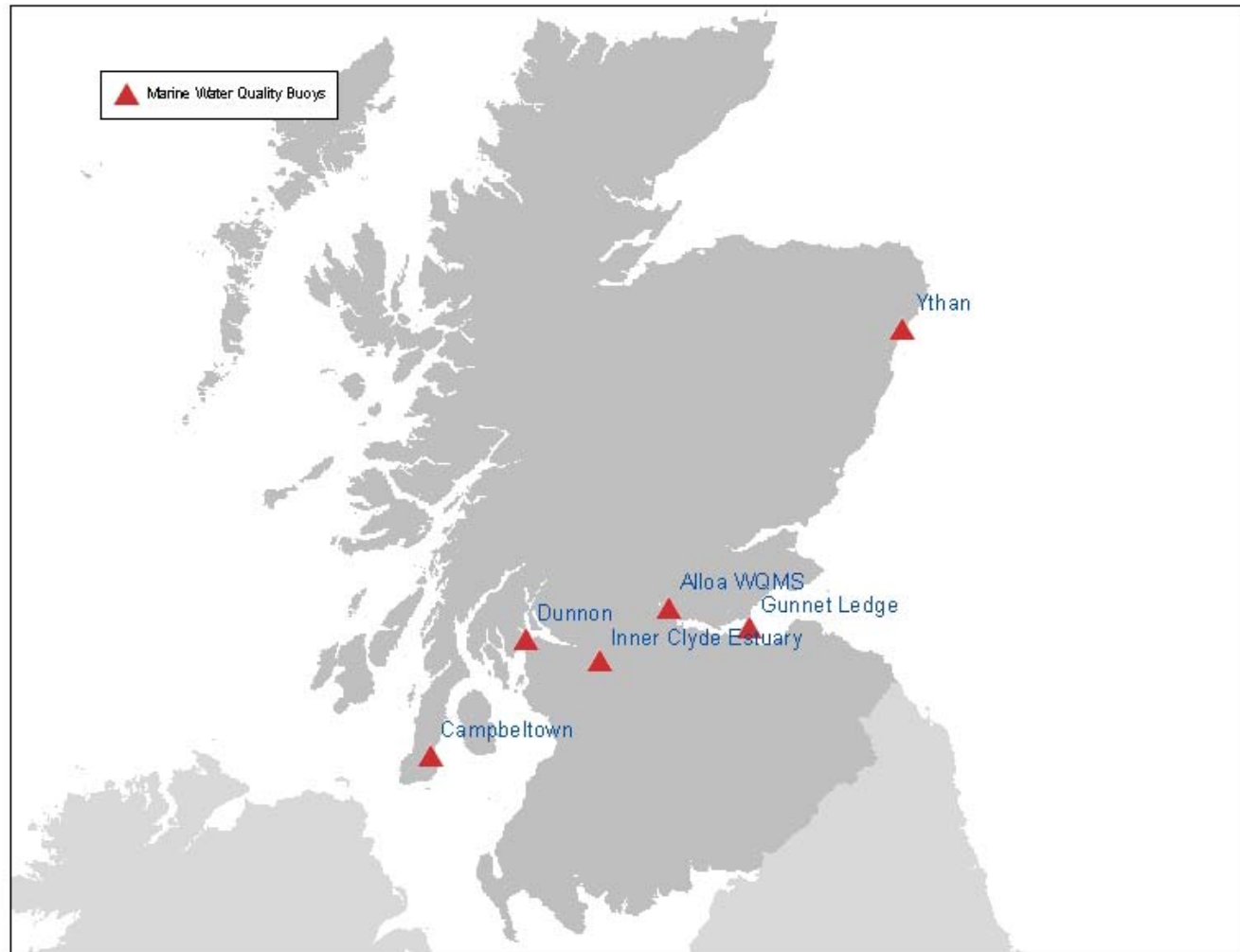


# Monitoring Dedicated Surveys

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## National Marine Monitoring Buoy Network



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## National Marine Monitoring Buoy Network



- 1. S
- 2. C
- 3. M
- 4. S
- 5. C
- 6. F



## Buoy Sonde Maintenance and QA/QC

Also used in survey work

1. SEPA
2. Science
3. Current
4. Monitoring
5. Networks
6. Maintenance and QA/QC
7. SEPA
8. Ferry
9. Computer
10. Future

W M0678 - FIELD MONITORING EQUIPMENT - Equipment / Assets Details - Q-Pulse

File Edit View Actions Window Help

Number: W M0678    Asset Type: FIELD MONITORING EQUIP    Serial Number: 10C 100793  
 Owner: Engelke, Clemens    Location: EAST KILBRIDE - ORBITAL

Description: YSI 6600 water quality monitoring sonde

Manufacturer:    Available:  Yes  No    Associated Document: Measurement of Salinit...  
 Department: Marine Chemistry

Calibration

Owner: Blackburn, Matthew    Source:  Internal  Supplier    Period: 12 Months  
 Associated Document: Measurement o...    Marine Chemistry

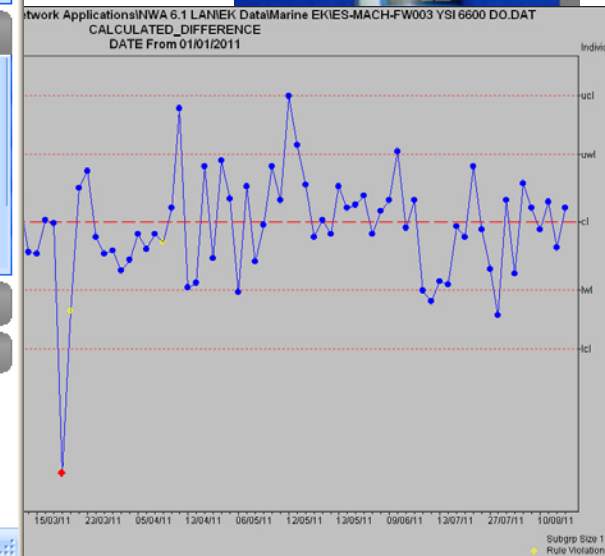
Last / Next Activity	Due Date	Performed Date	Performed By	Outcome	Certificate Number
	26/05/2011	25/05/2011		Calibration	
	25/05/2012				

Non-Conformances

Properties



cks



## FerryBox on board the MV Caledonian Isles

### Ardrossan - Brodick



- 4 or 5 times a day
- Every day of the week
- Throughout the year
- Large size (94m)
- Telemetry link



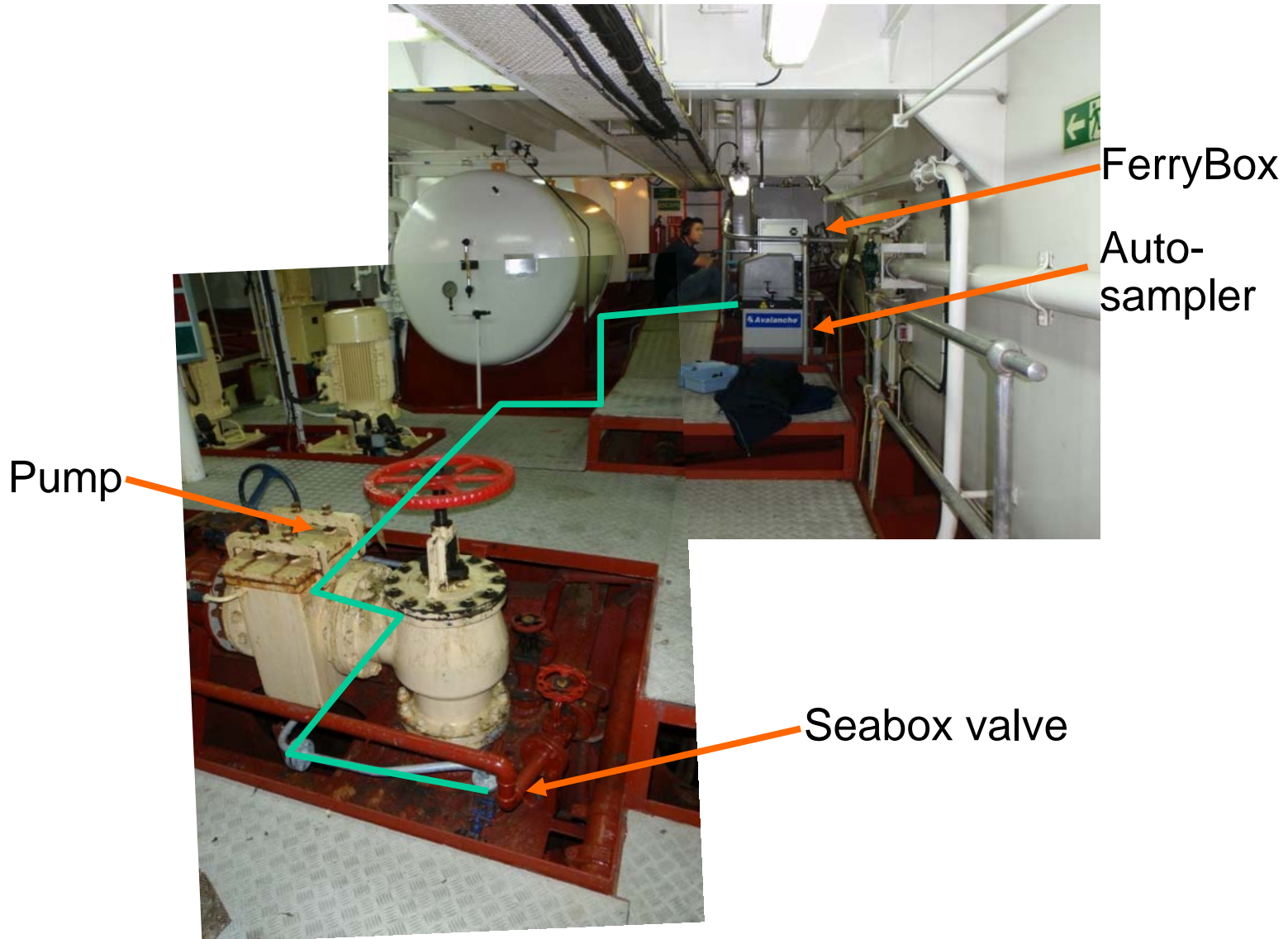
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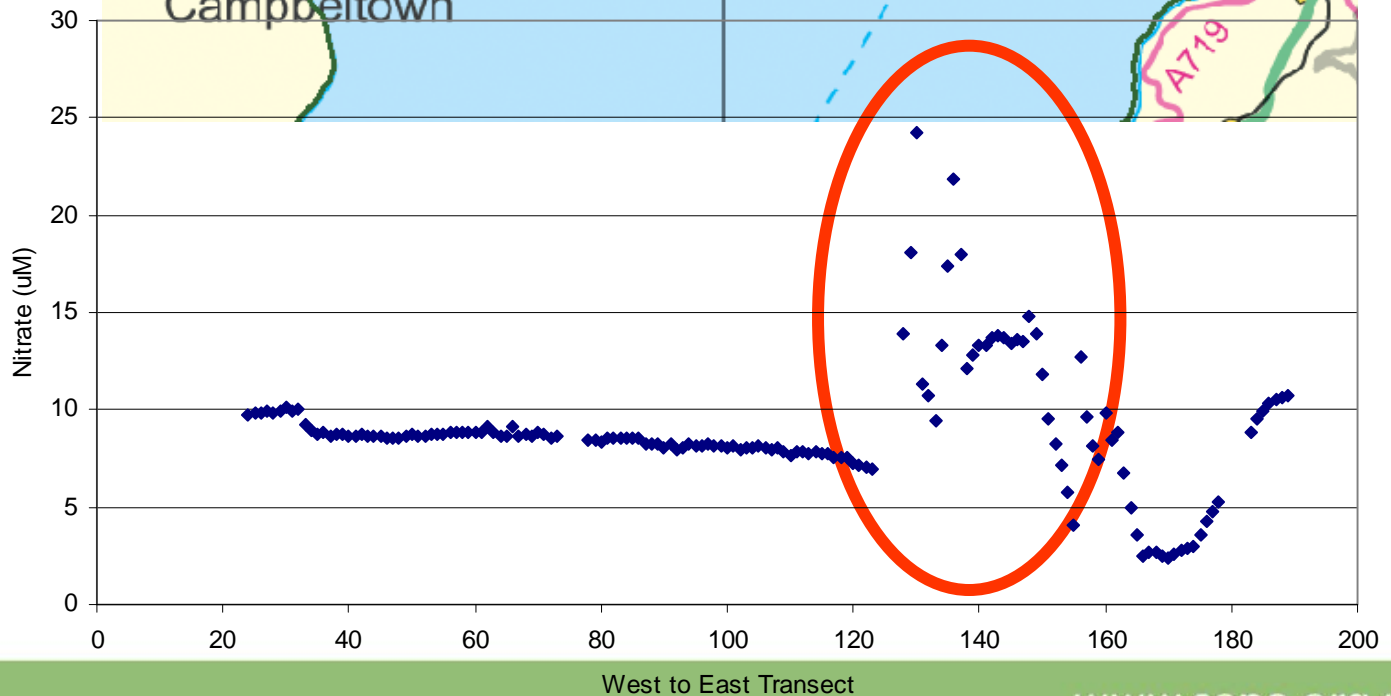
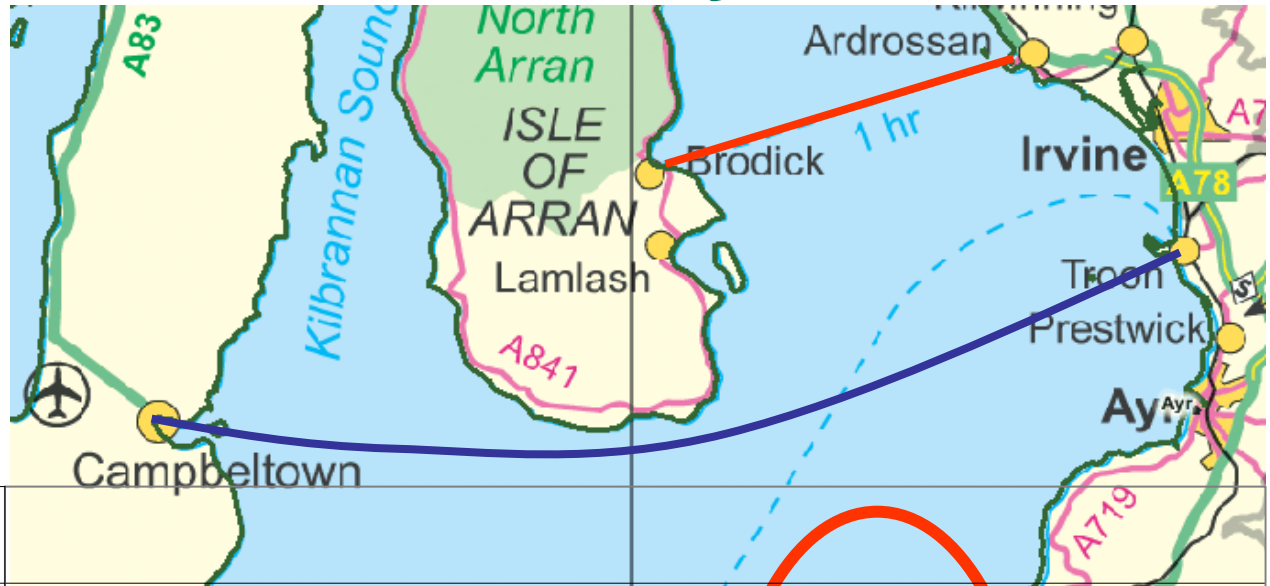


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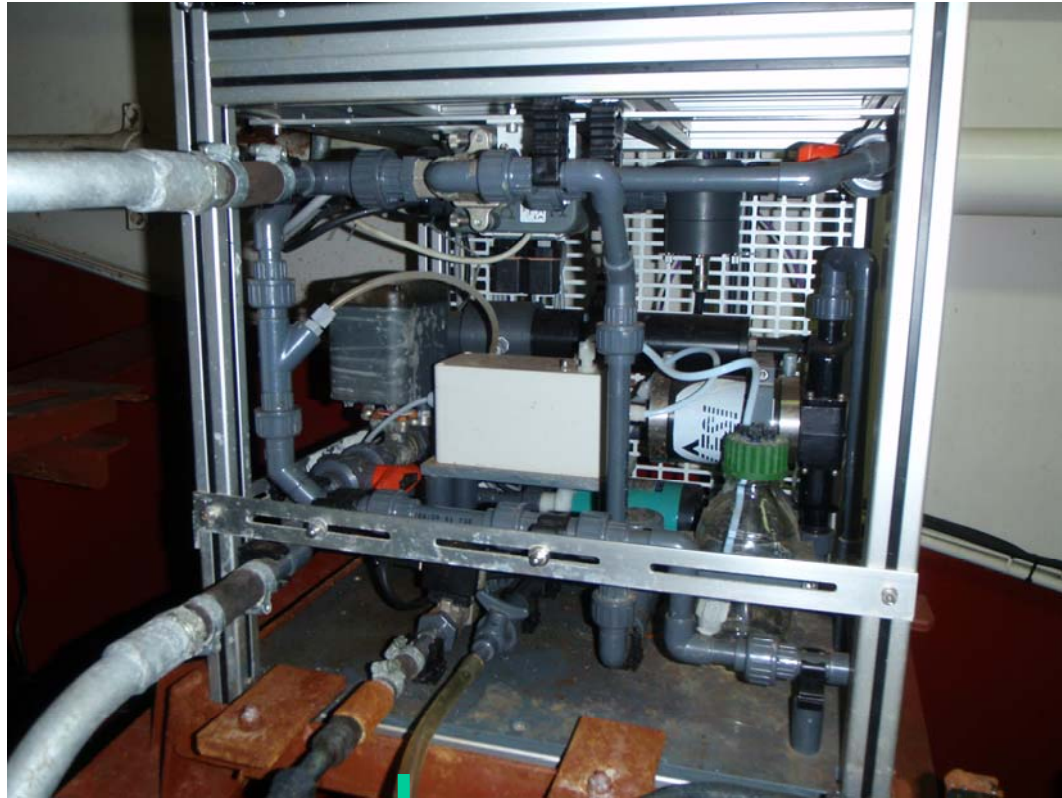


## Transect and Clyde Plume



1. SEPA, Marine Science, WFD
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## QA/QC



Laboratory

- Salinity
- DO (Winkler)
- Chlorophyll

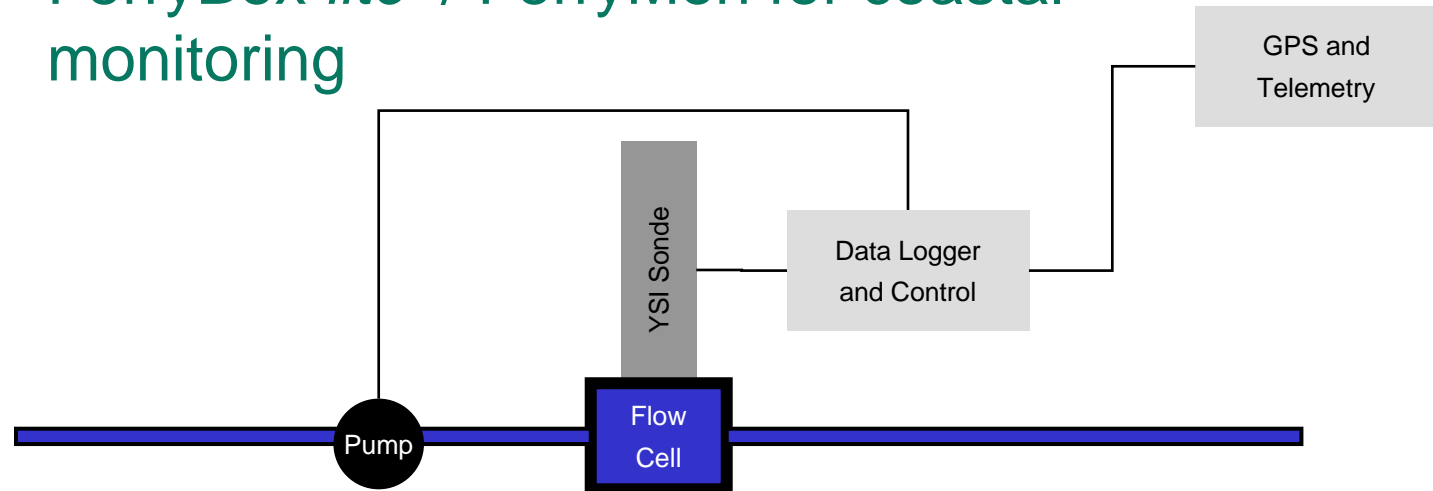
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# Comparison

	Buoy	FerryBox
Initial Cost	1/2 to 2/3 of FB	
Implementation time	3 - 6 month	1.5 - 2 years
QA/QC	pre-/post-deployment checks in lab	Validation samples taken in field
Operational Issues	Requirement of small boat	Easy daily access
Power	Limited (batteries, solar panels)	Plenty (e.g. for refrigerated sampler)
Measurements	In situ only	In situ and sample collection possible (e.g. Nutrients, Algae)
Coverage	Multi-depth possible	Transects

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- More potential ferry routes in Scottish coastal waters
- FerryBox *lite* / FerryMon for coastal monitoring

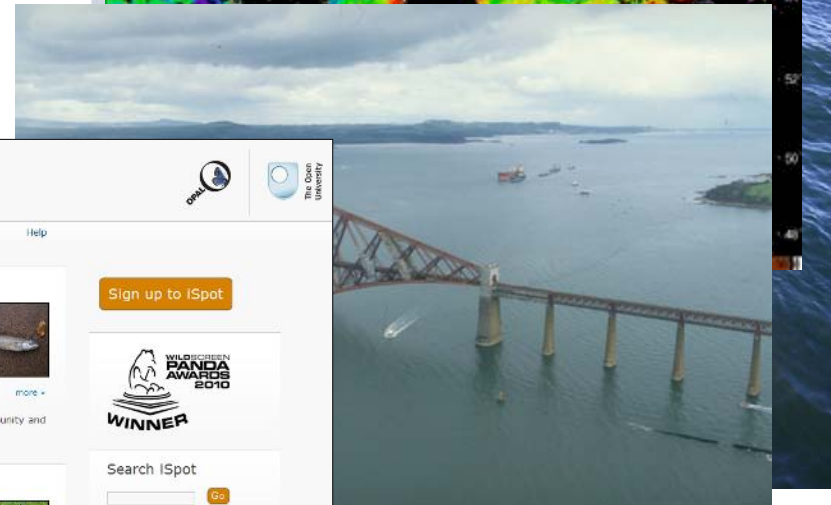
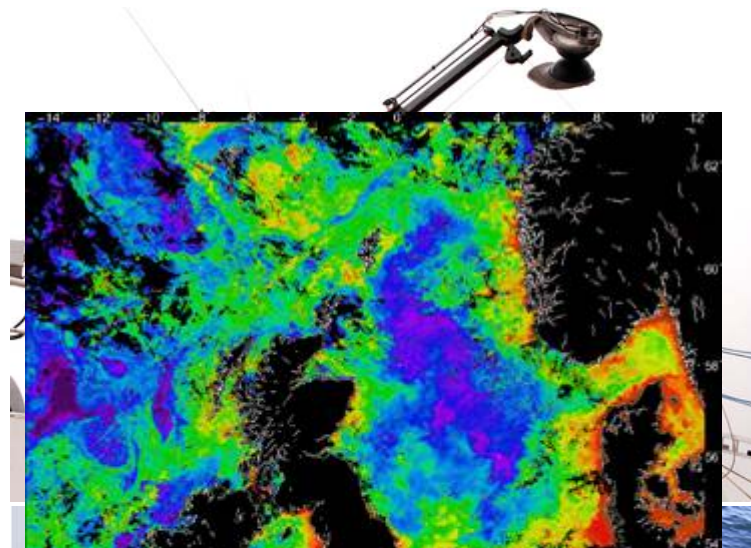


- Sample freezer
- Autosampler suitable for  $T_A$  and DIC (OA)
- High-resolution pH and  $pCO_2$  measurements



## Integrated Coastal Monitoring

- Dedicated surveys
- Buoys
- FerryBoxes
- Satellite data
- Aerial photography
- Citizen Science



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# Thank you!

Caledonian Isles

Brodick Harbour

## Routine Monitoring in support of WFD and ensuing demands on a FerryBox System in Scottish Coastal Waters

Clemens Engelke

*Scottish Environment Protection Agency, East Kilbride, Scotland, UK*

The Scottish Environment Protection Agency (SEPA) is the competent monitoring authority for the EC Water Framework Directive (WFD). SEPA Marine Science collects data to classify the eutrophication status of coastal and transitional waterbodies. However, the data are spatially and temporally limited by the availability of survey vessels and small boats. Additional continuous data is needed to increase the statistical confidence of the data. These data are collected using equipment deployed on buoys and from a FerryBox in the Firth of Clyde on board the MV Caledonian Isles. For this purpose, quality control and assurance procedures on the FerryBox have to reflect best practice already in place for the monitoring buoys. Furthermore, extending the use of FerryBox systems in routine monitoring will require initial costs and implementation timeframe to be addressed. Our goal is an integrated monitoring network of dedicated surveys, marine water quality buoys and FerryBox systems, as well as other modes of remote sensing (e.g. satellite).