

PML

Plymouth Marine
Laboratory

Listen to the ocean

Oceanographic measurements from surfers and satellites

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**National Centre for
Earth Observation**
NATIONAL ENVIRONMENT RESEARCH COUNCIL

The coastal zone

↑ **Marine biodiversity**

Tittensor et al. 2010 Nature

↑ **Economic value**

*Costanza et al. (1999, 2010)
Nature, Global Environ. Chang.*

↑ **Vulnerability**

Jickells (1998) Science

↑ **Variability** (temporal and spatial)

↑ **Challenging to sample**

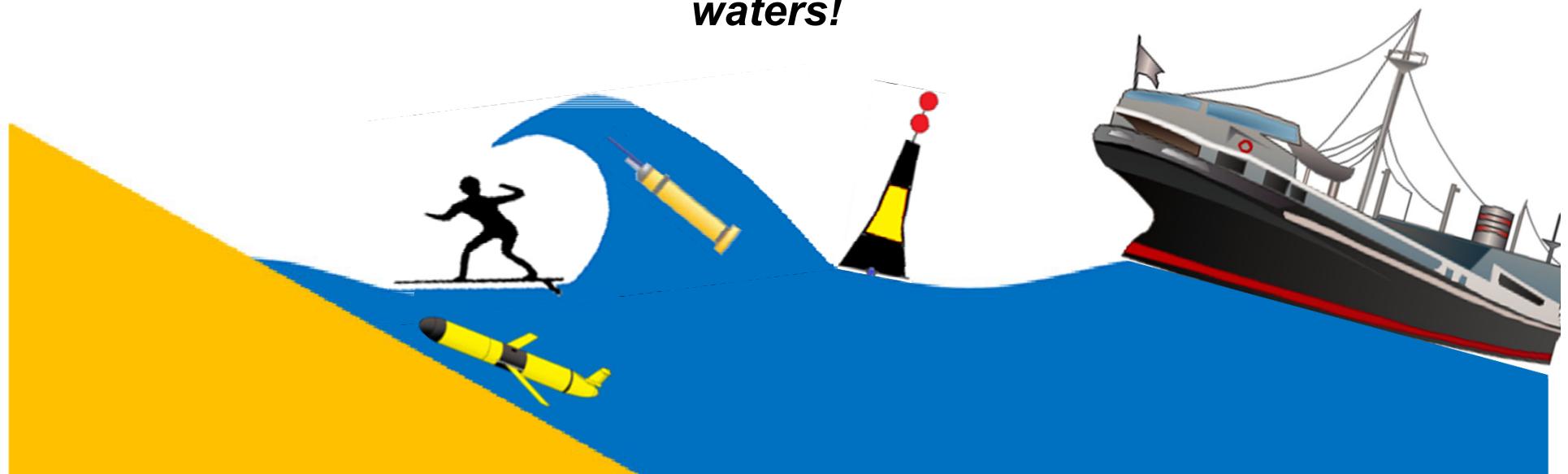
Davidson et al. (2007) Coast. Eng. J.







New solutions are needed to improve *in situ* data collection in nearshore coastal waters!

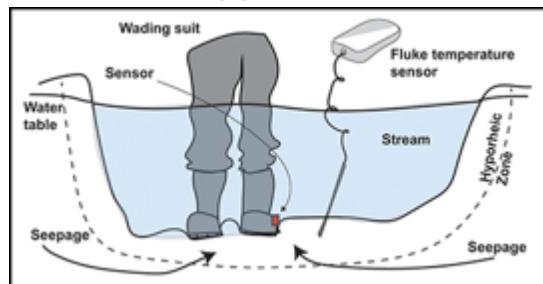


In situ measurements in the coastal zone





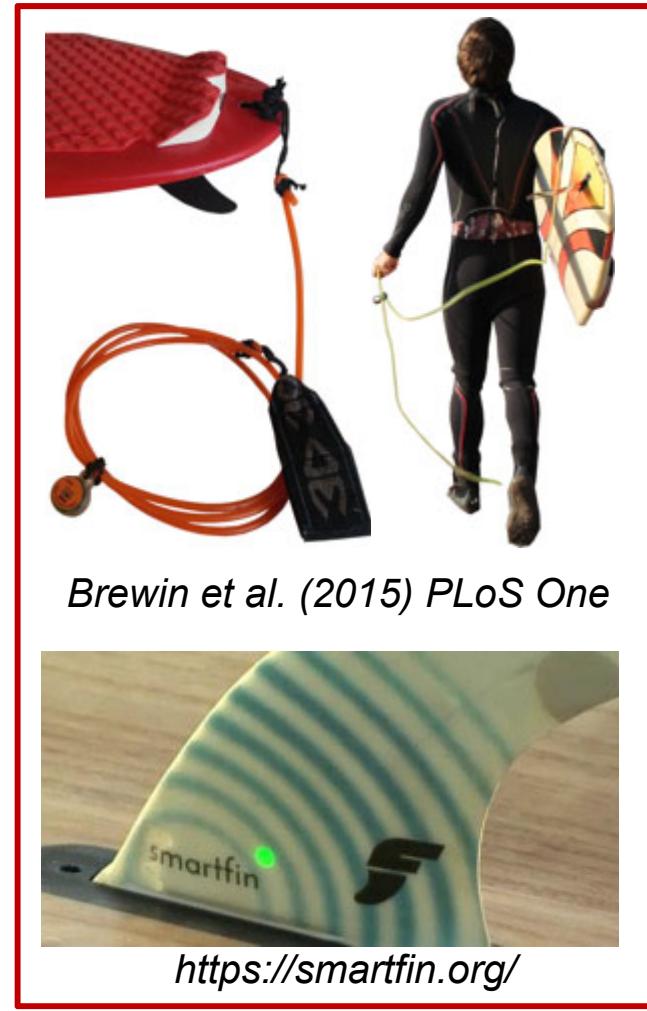
Wright et al. (2016)
Scientific Reports
Egi et al (2018)
Appl. Sci.



Hut et al. (2016)
*Geosci. Instrum.
Method. Data Syst.*



Bresnahan et al. (2016)
Methods in Oceanogr.

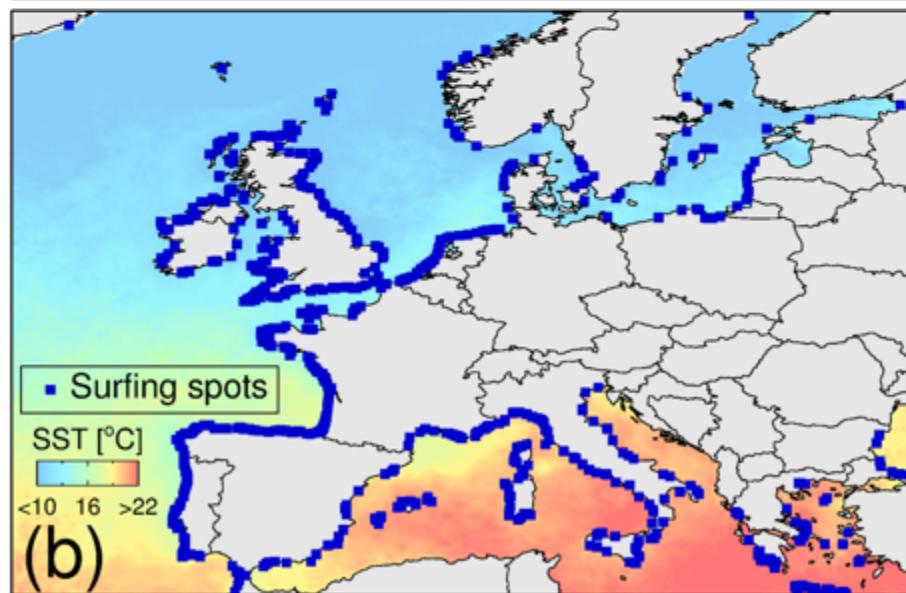
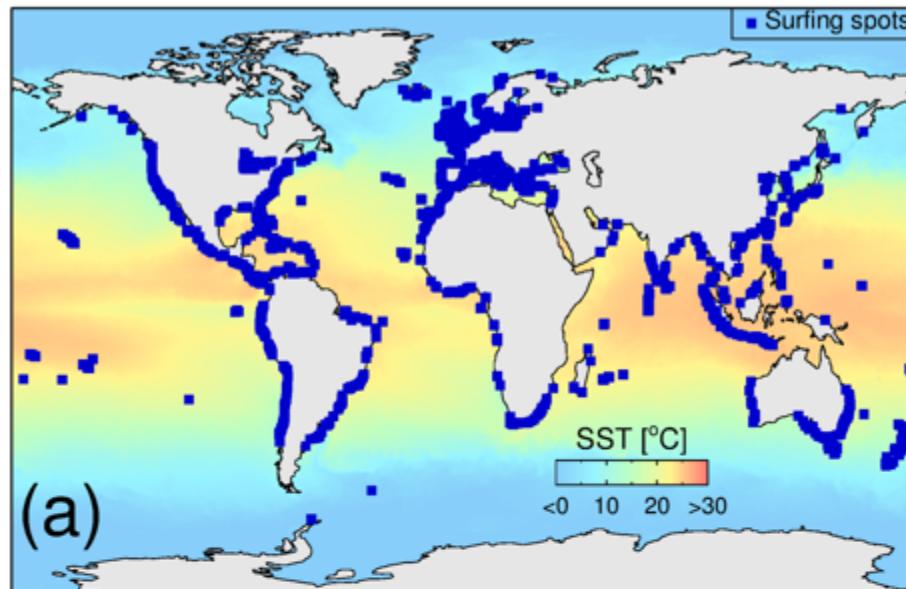


<https://smartfin.org/>

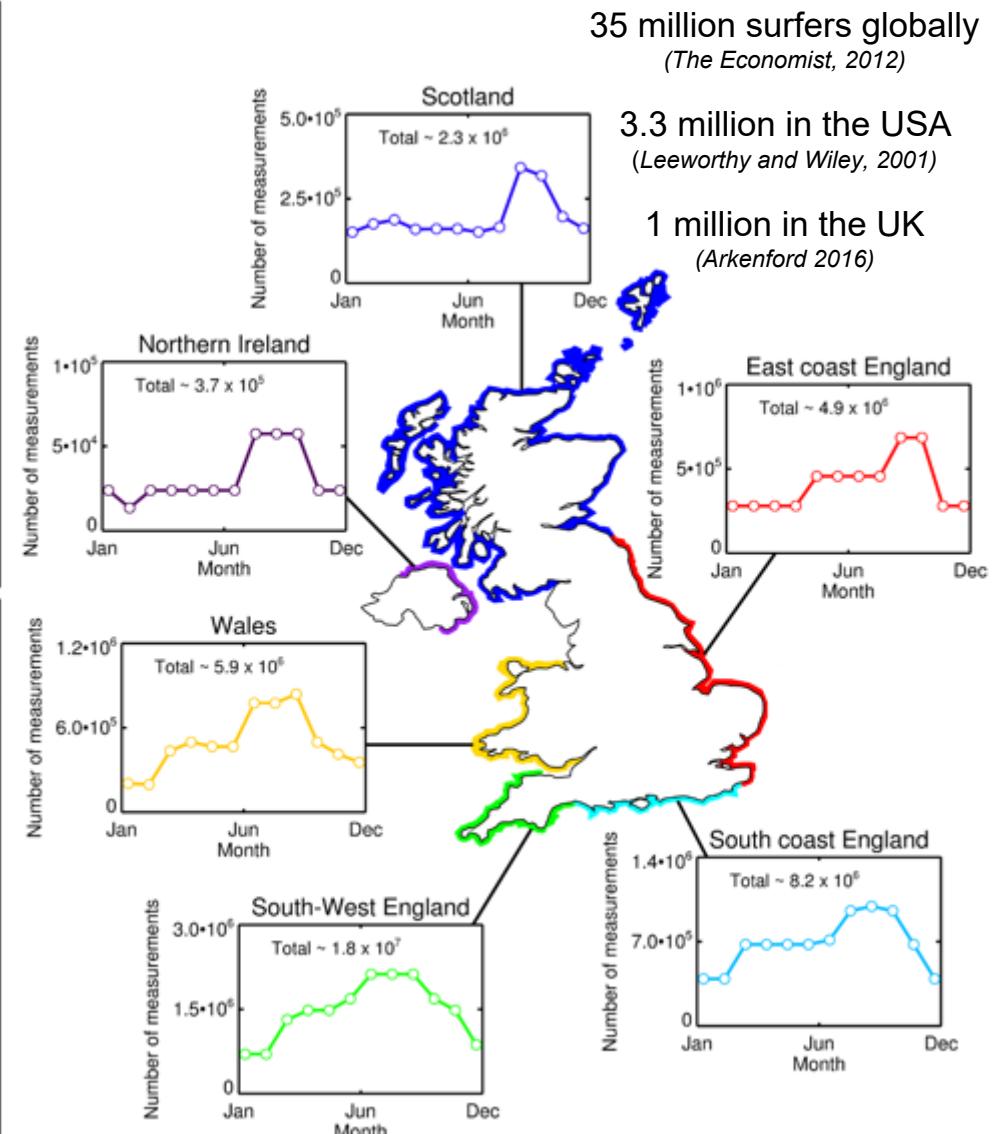


Brewin et al. (2017) *Frontiers in Marine Science*

Coastal *in situ* observations through surfing



Brewin et al. (2017) *Frontiers in Marine Science*



Brewin et al. (2015) *PLoS One*

35 million surfers globally
(*The Economist*, 2012)

3.3 million in the USA
(Leeworthy and Wiley, 2001)

1 million in the UK
(Arkenford 2016)

Evaluating the surfing sensors



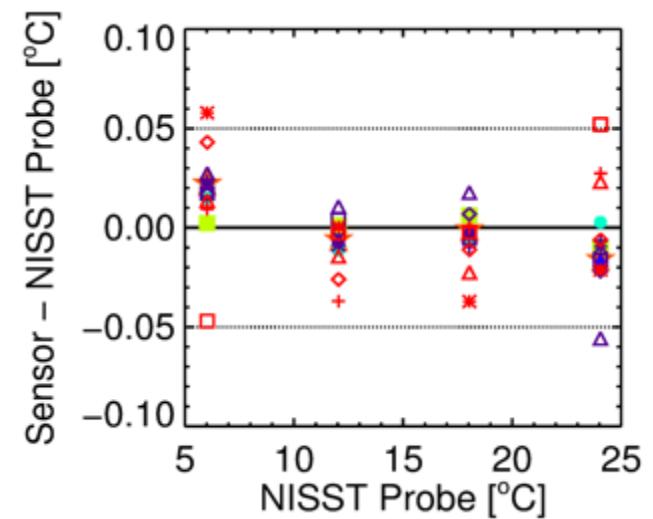
Brewin et al. (2015) PLoS One



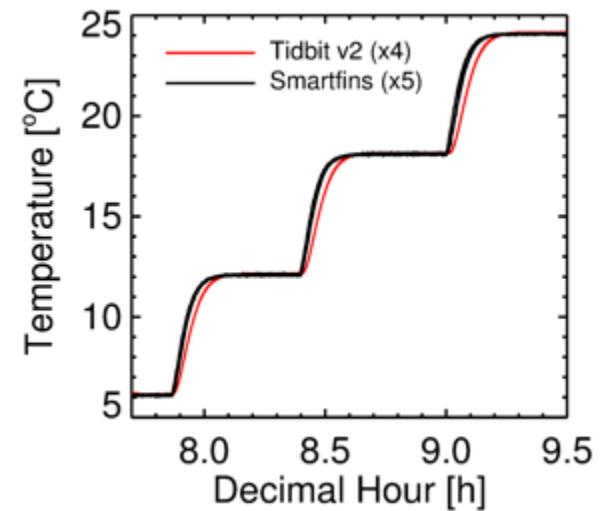
<https://smartfin.org/>



Laboratory



Brewin et al. (In Prep)



Evaluating the surfing sensors

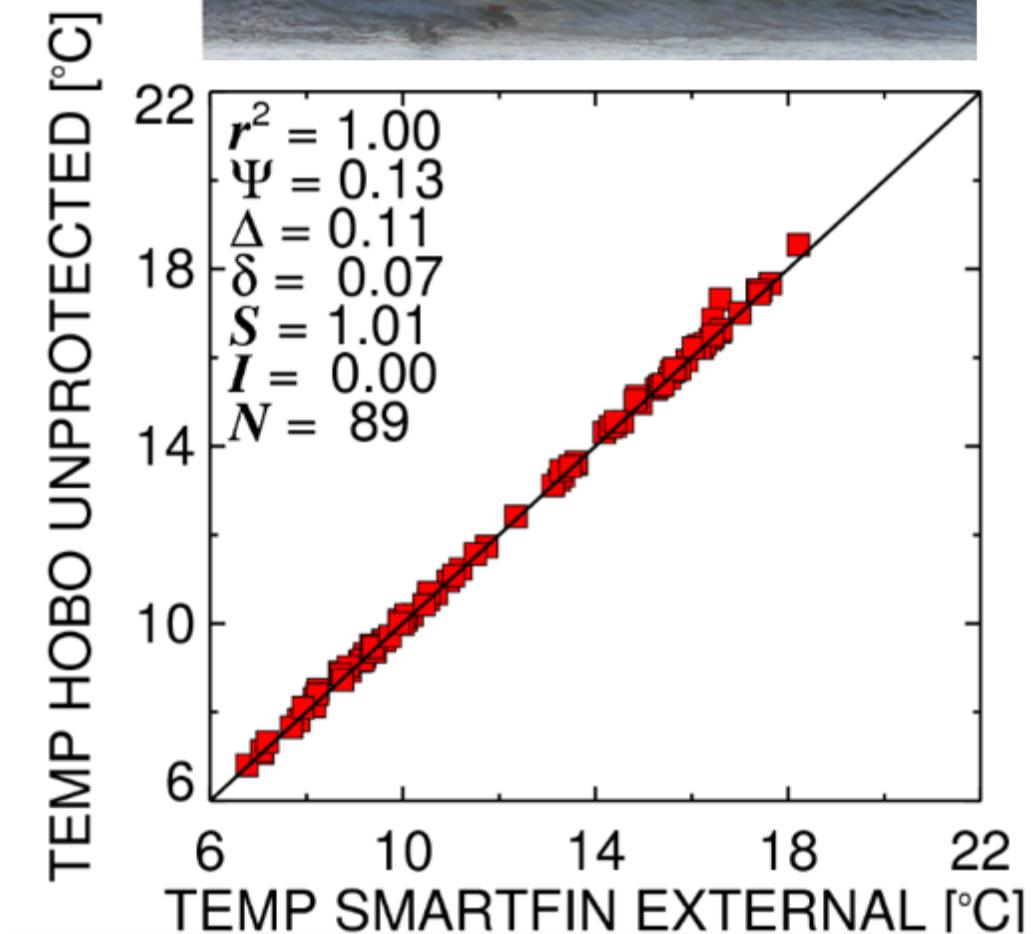


Brewin et al. (2015) PloS One



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Field



Brewin et al. (In Prep)

Evaluating the surfing sensors

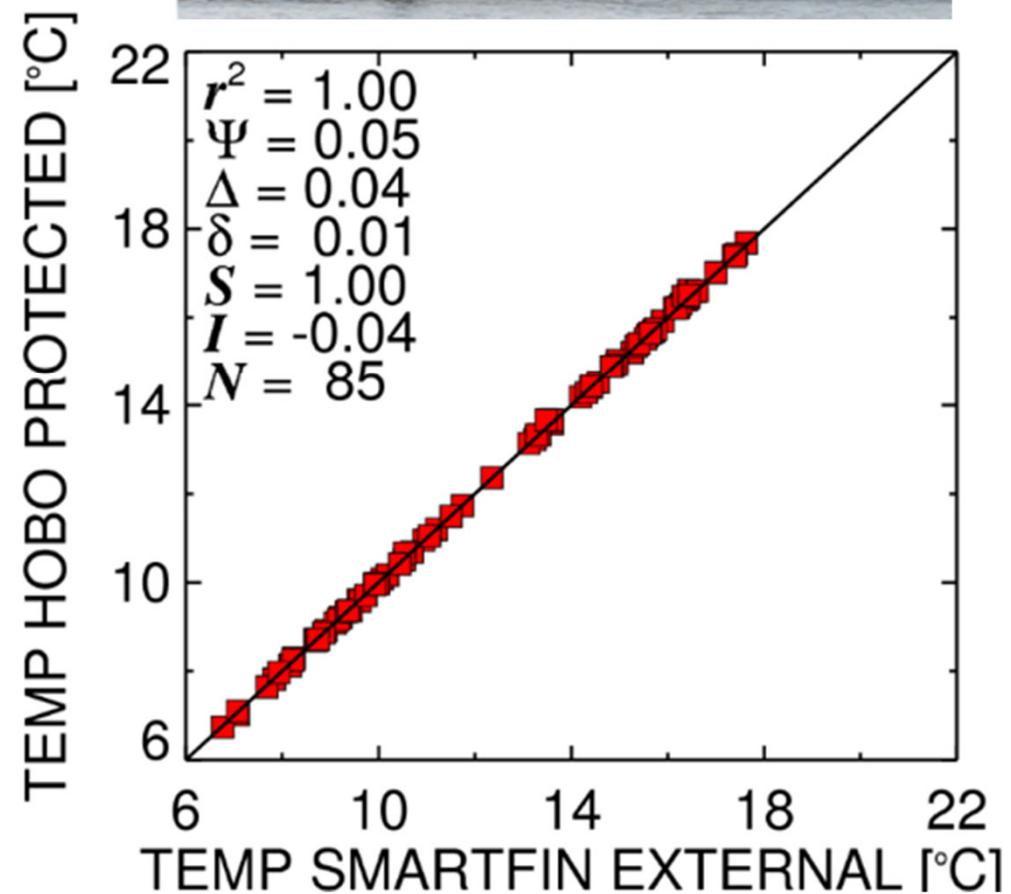
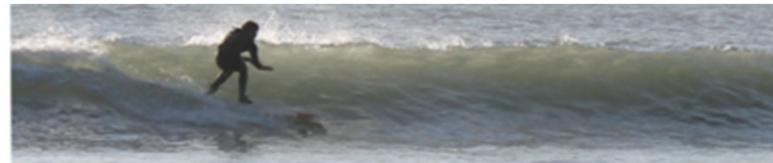


Brewin et al. (2015) PloS One



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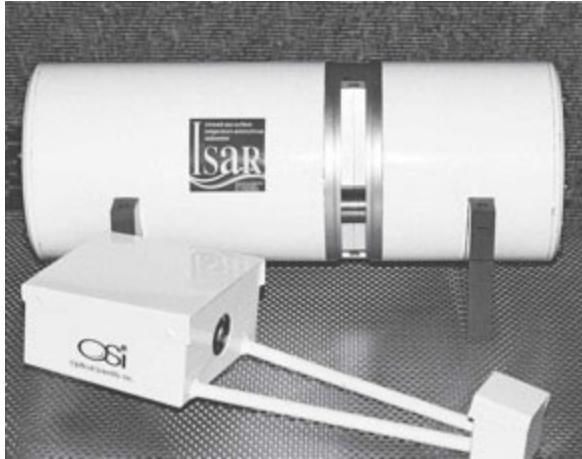
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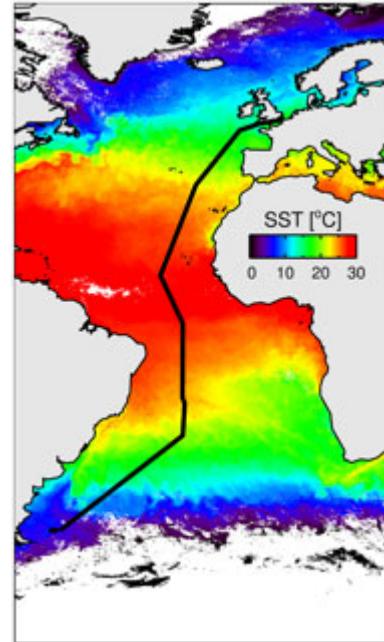
Brewin et al. (In Prep)

Evaluating the surfing sensors

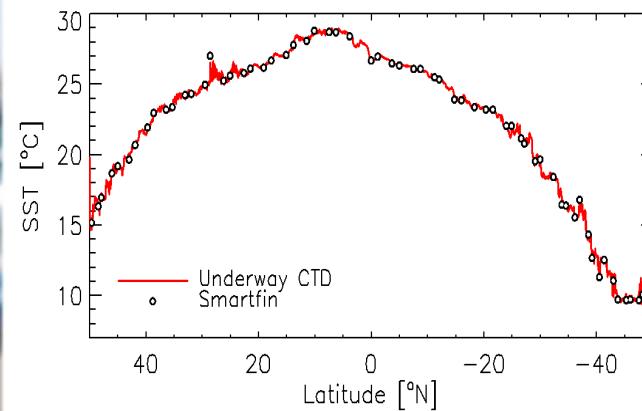
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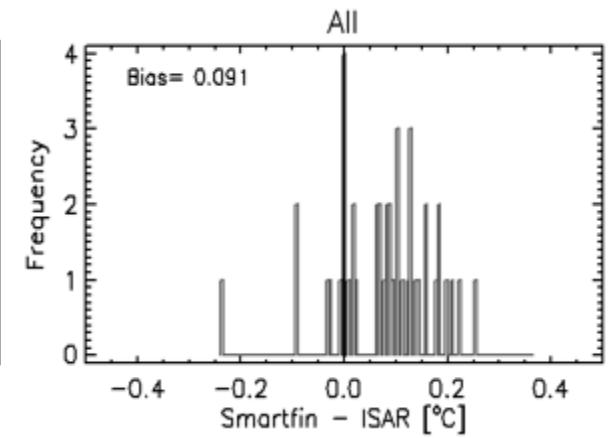
Donlon et al. (2018) JAOT



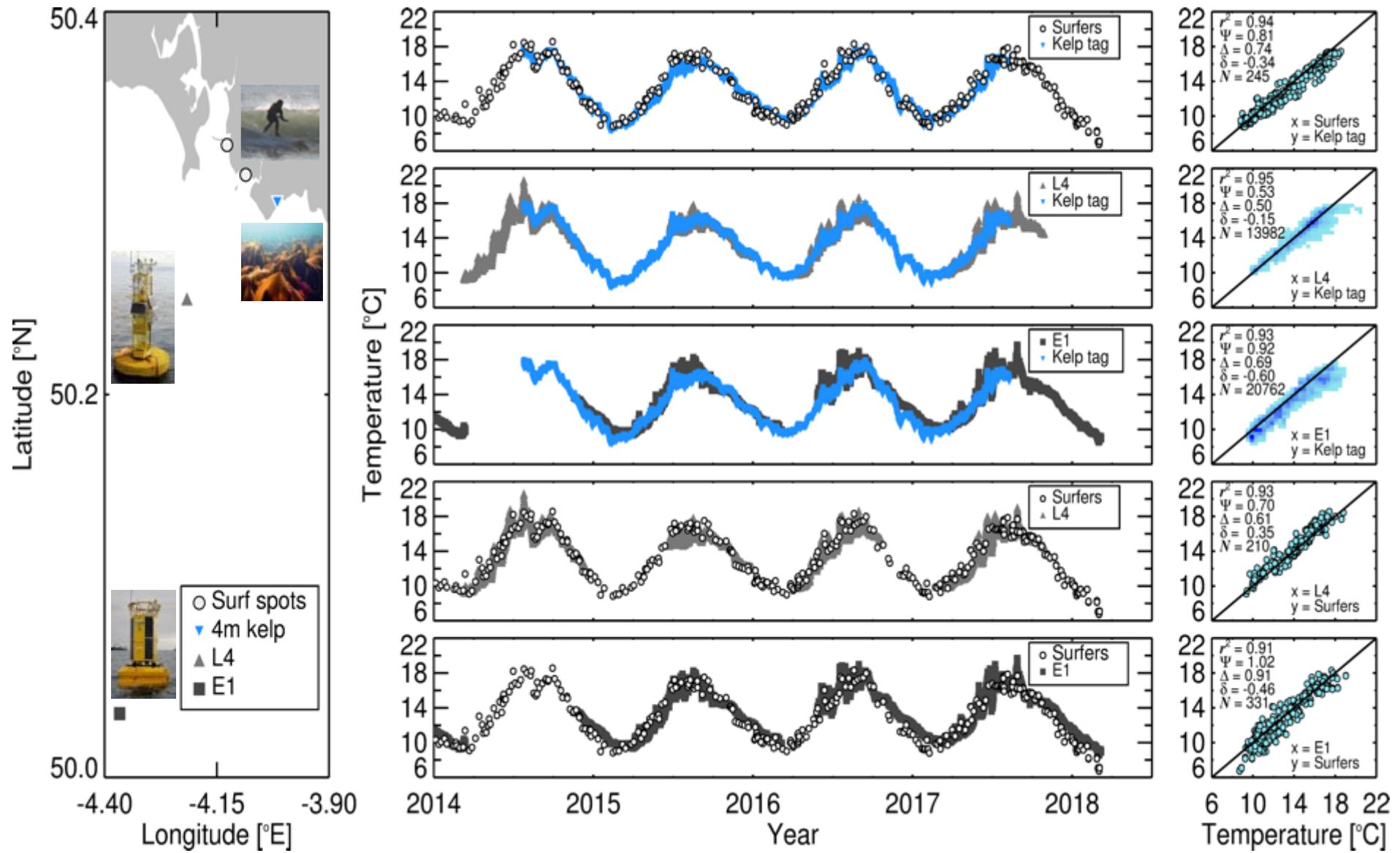
<https://smartfin.org/>



Brewin et al. (In Prep)



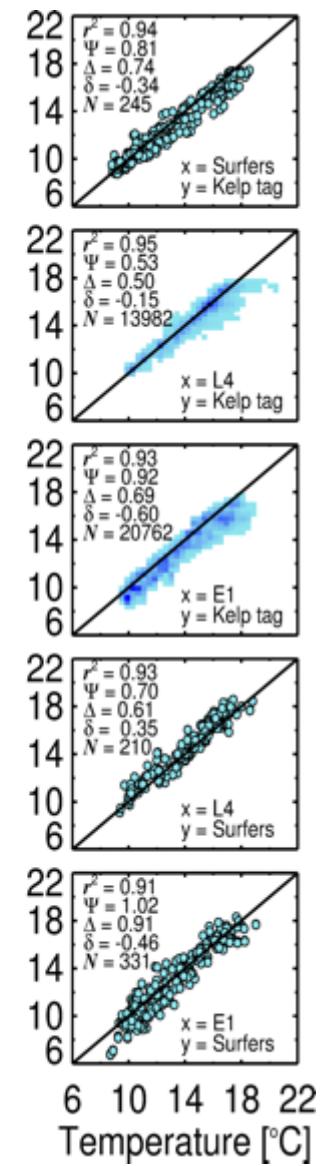
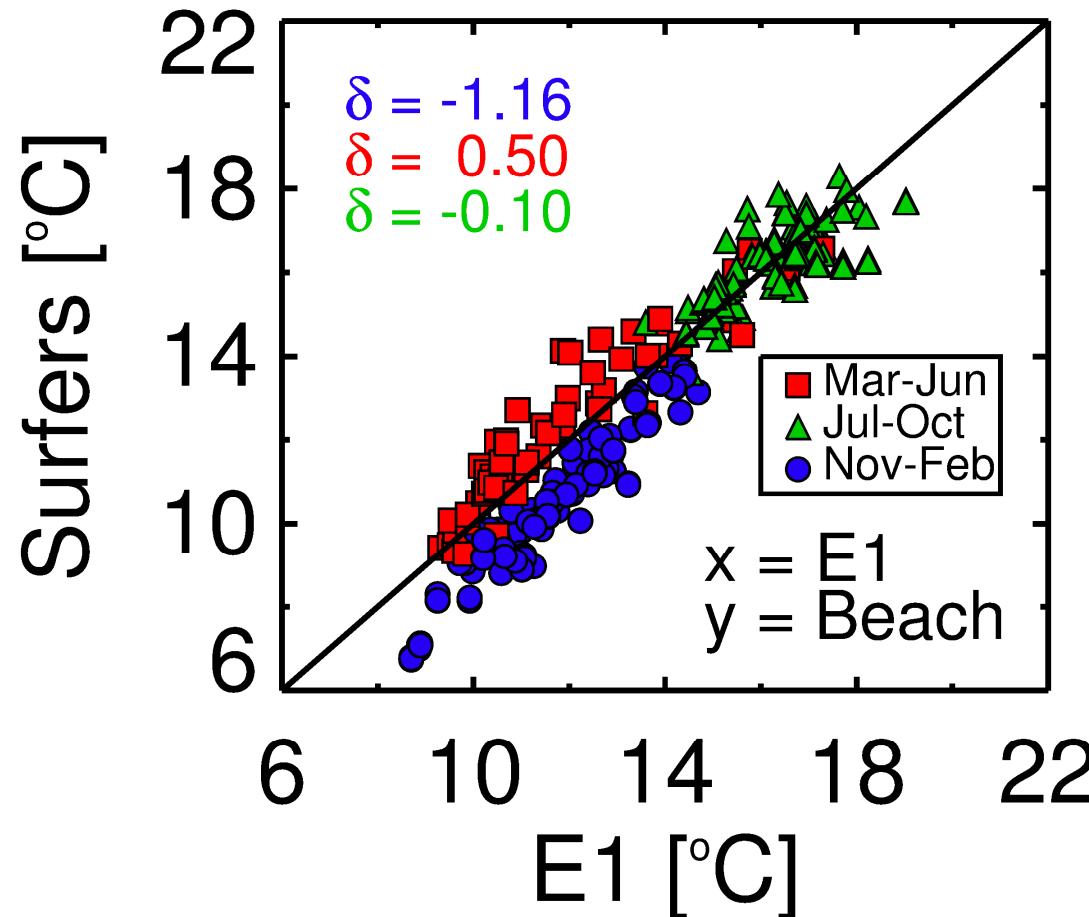
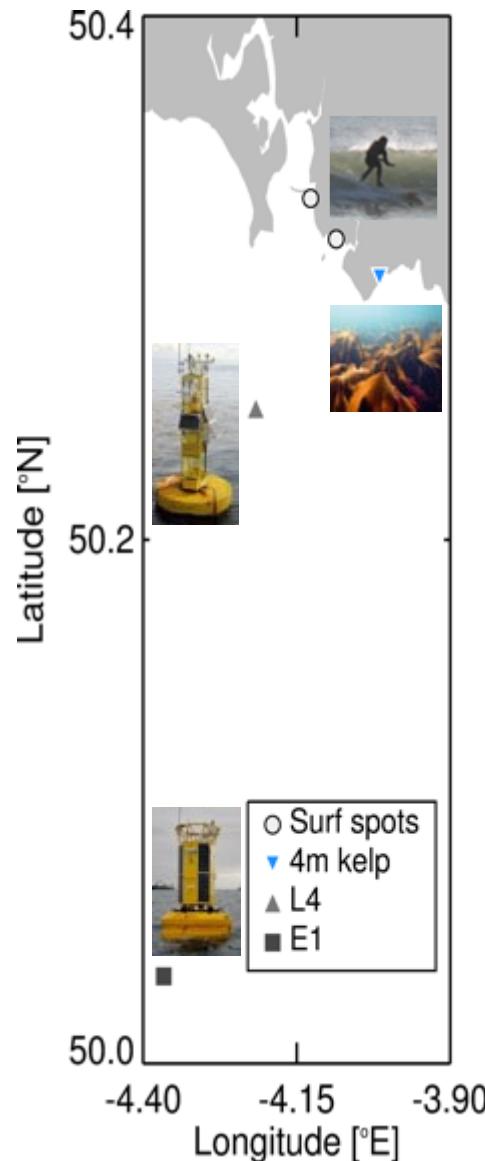
Surfing data comparison with other *in situ* data



Brewin et al. (2017) *Estuar. Coast. Shelf Sci.*

Brewin et al. (2018) *Remote Sensing*

Surfing data comparison with other *in situ* data

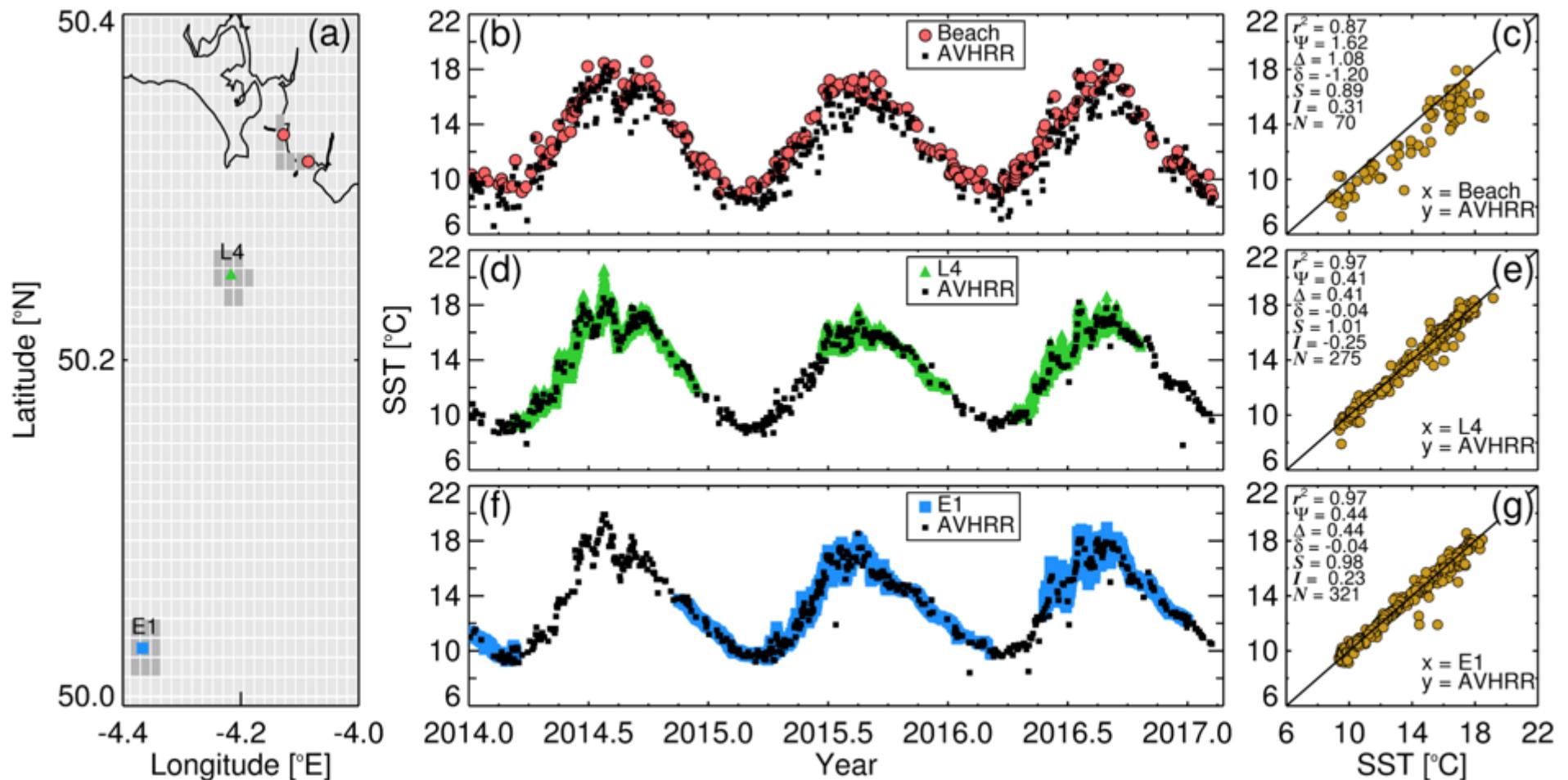


Brewin et al. (2017) *Estuar. Coast. Shelf Sci.*

Brewin et al. (2018) *Remote Sensing*



LOWER SPATIAL HIGH TEMPORAL RESOLUTION SATELLITE (AVHRR)



Brewin et al. (2017) *Estuar. Coast. Shelf Sci.*

Brewin et al. (2018) *Remote Sensing*

Press coverage

Surfers: The Secret Weapon in Monitoring Coastline Health
Collecting sea-surface temperature data while hanging ten.

takepart

NEWS ENVIRONMENT FOOD CULTURE WORLD BUSINESS TAKE ACTION

Oceanographer Aims to Turn Millions of Surfers Into Marine Scientists

PHYS.ORG Nanotechnology Physics Earth Astronomy & Space Technology Chemistry

f t e-mail

Home > Earth > Environment > July 9, 2015

ONE MINUTE INTERVIEW

Surfers on a mission

It is tricky to get coastal data, so Bob Brewin wants to recruit a volunteer surfer armada to help.

Why use surfers? Why not attach sensors to boats?
The techniques are easily transferable to other recreational watercraft. The focus on surfers is really to get observations of the near-shore environment. It is difficult to get a small drifter into 3-4 feet (0.9-1.2 metres) of surf.

What monitoring equipment do you use?
We have been attaching a small temperature logger at the mid-point of a surfboard's length and putting a GPS device in a small waterproof waist bag for that surfer to wear.

You went surfing 85 times wearing this kit last year. What did you find?
By comparing the temperature data collected by the kit with a very accurate buoy about

PROFILE
Bob Brewin is a satellite oceanographer at

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THE Herald

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Plymouth surfers used in innovative study climate change

By Plymouth Herald | Posted: July 08, 2015



STEAM
REGISTER



Surfing for science



July 9, 2015

Scientists plan to use surfers to monitor the coastal environment

Surfers enlisted to help monitor ocean

Dr BOB BREWIN Lead scientist and keen surfer

RESEARCHERS WANT TO ENGAGE AN ARMADA OF SURFER SCIENTISTS

Surfers wired up to study the waves

By Western Morning News | Posted: July 12, 2015



LATEST NEWS



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SCIENCE ENVIRONMENT

SCIENCE JULY 30 2015 7:04 PM ET

Surfing for Science: Sport Could Help Keep Tabs on Ocean Temperatures

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Kat Flann

Scientists put a 'smartfin' on my surfboard. Is it the next wave in ocean monitoring?

Sea Kayakers help environmental data collection in the aquatic environment

Dra. Bob Brewin, Lise da Mota and Tom Jackson are marine scientists based at Plymouth Marine Laboratory in the UK. They specialize in satellite remote-sensing of the oceans and marine ecosystem modelling. They are all science assessors.

management is challenged by increased sampling of key environmental parameters, partly due to resource relating to in-situ data collection (e.g. boat hire, the cost of instrumentation and data analysis).

Thank-you for listening
For further information or interest please
contact me at

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