Animal Borne Ocean Sensors.
AniBOS – Animals as Essential Ocean Observers

CLIVAR-GOOS Workshop: From global to coastal: Cultivating new solutions and partnerships for an enhanced Ocean Observing System in a decade of accelerating change

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Briefly

Endorsed: GOOS - OCG 2020, UNDOS 2021

Our Vision: To enhance understanding and describe our changing oceans through the eyes of marine animals

Our Mission: Collect and make freely available oceanographic measurements from the most inaccessible regions of the global seas to understand our Changing Oceans
Workshop Aims

Meet societal and scientific demand for climate information, forecasting, and prediction, the ocean observing community

Set priorities for expanding ocean observing systems

Develop integrated, cost-effective means to collect & maintain long-term ocean observations

Provide the science i.e. the power, for coastal communities to prepare and respond to changes in ocean structure & productivity

From global to coastal: Cultivating new solutions and partnerships for an enhanced Ocean Observing System in a decade of accelerating change
The How
Deployment chronology & the sensors used: > 470 deployments (2004-2022)
Filling Physical & Biological Observational Gaps in Eastern Antarctica
Measurement of biogeochemical variable

Fluorescence

Biological activity in time and space
Chla profiles from light attenuation data

Biomass estimation: Overall error < 5%
Measurement of biogeochemical variables

Dissolved Oxygen

Optode Aandera & Oxygen Optode 4330F

* But, calibration and measurement stability issues over time!
Measurement of biogeochemical variables

Dissolved Oxygen

Pyro FD-OEM-O2 Oxygen sensor

The results are promising – deployments still active
< 25% of Antarctic (& World) bathymetry is mapped
Measuring Prey Fields

Sonar & Behaviour
... but most people live in tropics & sub-tropics

Turtles carrying CTDs can provide essential observations in coastal areas where most people live & improve weather & climate forecasting e.g. JCOPE2M
Towards an enhanced Ocean Observing System

Animals measure many of the oceans’ attributes that are needed for sustained ocean observing systems
Towards an enhanced Ocean Observing System

Integrating complementary Observing Systems – Animals, Floats, Autonomous vehicles, Ships, Moorings, Satellites etc. Provides the essential science to empower coastal communities.
Thank-you & Questions

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