Update on Deep Ocean EOVs: Biogeochemistry

Felix Janssen (felix.janssen@awi.de) Alfred Wegener Institute, Bremerhaven, Germany



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DOOS BGC EOV update

Identify & specify deep-ocean biogeochemistry EOVs needed to address scientific and societal needs







Current list of GOOS & DOOS BGC EOVs

EOV

Inorganic C / carbonate system

¹³C inorganic carbon

Inorganic macro nutrients

Dissolved oxygen

Dissolved organic matter

Particulate (organic) matter

Nitrous oxide

Transient tracers

Respiration rates

Seafloor labile organic matter

Seafloor methane efflux

Ocean Color

DOOS and GOOS DOOS only GOOS only

	Multidiscipling		Physics											Biogoechem												Biology and Ecology																	
	approach to EOVs	Sea state	Ocean surface stress	Sea ice	Sea surface height	Sea surface temperature	Subsurface temperature	Surface currents	Subsurface currents		sea surface salinity	Subsurface salinity	Ocean surface heat flux	Ocean Bottom Pressure	Geothermal Fluxes	Ocean Turbulence	Oxygen	Nutrients	Inorganic carbon	Transient tracers	Particulate matter	Nitrous oxide	Stable carbon isotopes	Dissolved organic carbon	Ocean colour (under development)	Seafloor labile organic matter	Seafloor respiration	seajioor jiula aria gas ejjiuxes Littor/micronlacticc	בוננכול ווווכו טטומטנורט הא	Phytoplankton biomass and diversity	Zooplankton biomass and diversity	Fish abundance and distribution	Turtles, birds, mammals abund. & distrib.	Live coral	Seagrass cover	Macroalgal canopy	Mangrove cover	Microbe biomass and diversity (emerging)	Benthic invertebrates abund. & distrib.*	Fauna boay size, specific biomass, aensity Bioacouction	Seafloor soonge hahitat cover	Connectivity of species	
1	Deep-ocean's role in Earth's energy imbalance and heat & freshwater budget																																										
2	Connection of climate variations to the global overturning circulation incl. ecological impacts																																										
3	Response of pelagic ecology to multiple climate change stressors and industrial activities																																										
4	Climate change effects on the function of the solubility and biological carbon pumps, deep ocean food supply, and carbon sequestering																																										
5	Drivers of seafloor heat, nutrients, tracers, and oxygen fluxes and different carbon pools and connection to larger scale circulation.																																										
6	Natural and anthropogenic change effects on functions of animals and microbes in the deep sea and the seafloor.																																										

DOOS BGC EOV revision

Tasks

- Identify missing BGC EOVs, draft spec sheets
- Revise representation of deep-ocean specificities in GOOS EOV spec. sheets (e.g., phenomena, scales, observation networks)
- Feedback to GOOS BGC panel & issue DOOS EOVs
- Dissemination of outcomes (e.g., DOOS SIG, OceanObs '19)

Status

- First DOOS spec sheets drafted
- Deep ocean experts gathered in DOOS BEERE EOV task team
 'Guiding experts'
 Preparing and the (EOV): Seafloor labile particulated (Thomas.soltwedel@bwitask team)
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 'Consulting experised of the euphotic zone is
 'Consulting experised of the euphotic zone is
 - Revising

And Doos for ence and exported out of the euphotic zone is eventually supplied to the seafloor and representer to sustain the experience to sustain the ence to sustai Iocalizea seafloor ecosystems – the sole food source to sustain **Notices** taxonomic and functional diversity, and food web structure of benthic biota. Characteristics of benthic communities and functions of seafloor hindeochemical functions ity, and Jood web structure of pentnic plota. Undracteristics of pentnic communities an initial have strong implications of seafloor biogeochemical functions with organic material have strong implications to sustain future primary productivity of the strong initial have strong in the sustainable of the sustainable o nic modernic nove subory implications of sequor progeocitemical jancions in a term of a subtraction of nutrients to sustain future primary productivity. In a subtraction of nutrients to sustain future primary productivity term of the term of the subtractive the organic matter availability at the seafloor links the input term of urface seafloor productivity and export fluxes) to the long--lized in the water column to an and bathypelagic

Current list of GOOS & DOOS BGC EOVs

EOV	DOOS experts
Inorganic C / carbonate system	Christopher L. Sabine, Peter Brown
¹³ C inorganic carbon	Christopher L. Sabine, Peter Brown
Inorganic macro nutrients	Sinhue Torres Valdes
Dissolved oxygen	Clare Reimers, Rick Wanninkhof, Sinhue Torres Valdes
Dissolved organic matter	Thorsten Dittmar
Particulate (organic) matter	Ian Salter
Nitrous oxide	Hermann W. Bange
Transient tracers	Marie-Jose Messias, Peter Brown, Toste Tanhua
Respiration rates	Clare Reimers, Frank Wenzhöfer,
Seafloor labile organic matter	Henry Ruhl, Thomas Soltwedel
Seafloor methane efflux	Matthias Haeckel
Ocean Color	

Thank you!

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