BBNJ Side event, 2018-09-06 Jean-Olivier Irisson (and many others) Laboratoire d'Océanographie de Villefranche (LOV)



# Monitoring plankton in the open ocean with quantitative imaging

From images to data



# Most life in the ocean is small plankton

#### 1L sea water

10,000,000 bacteria 100,000 unicellular 1000 multicellular







(III)



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ZOOPLANKTON

k/

R AWKTON







(II)



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ZOOPLANKTON

k/





2 AWKTON





# Why care about plankton?

(IB)



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ZOOPLANKTON

of AWKTON



CARBON



# INDICATOR













#### Advantages

Repeatable

Collaborative

Individual level data

#### Limitations

Relatively low taxonomic resolution

Punctual sampling in time and space

# **Plankton and carbon sequestration**

Guidi et al, 2016, Nature Guidi et al, 2015, GBC



## **Plankton and fisheries**

Beaugrand et al, 2003, Nature Beaugrand et al, 2016, Phil Trans R Soc B

temperature anomalies

(dark grey)





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## How to collect data: scientific cruises



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# How to collect data: citizen science







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#### How to collect data: autonomous robots



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#### How to collect da





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For your safety DO NOT OPEN this instrument. If found, please contact the International Argo

email: aic@jcommops.org http://argo.jcommops.org Or contact you local Coast Guard or Fisheries Agency



# How to process and share data

http://ecotaxa.obs-vlfr.fr

Collaborative web application and database

Open source

60,000,000 images

~400 users worldwide

To be linked with the Ocean Biogeographic Information System (OBIS) of UNESCO



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#### **Take home messages**

1.Plankton is *essential* to the functioning of open ocean ecosystems, for oxygen production, carbon sequestration, and food production

2.Imaging can provide *quantitative* information on *individual* organisms, at high *throughput* 

3.Imaging instruments are *diverse* and their data can be *shared* on an open platform, allowing *collaboration* and contribution from all

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