The JPI Oceans Action S4GES workshop

[Patrick Roose, RBINS, Belgium]

A joint EU-JPI Oceans MSFD oceanographic cruise in 2021?

The vision

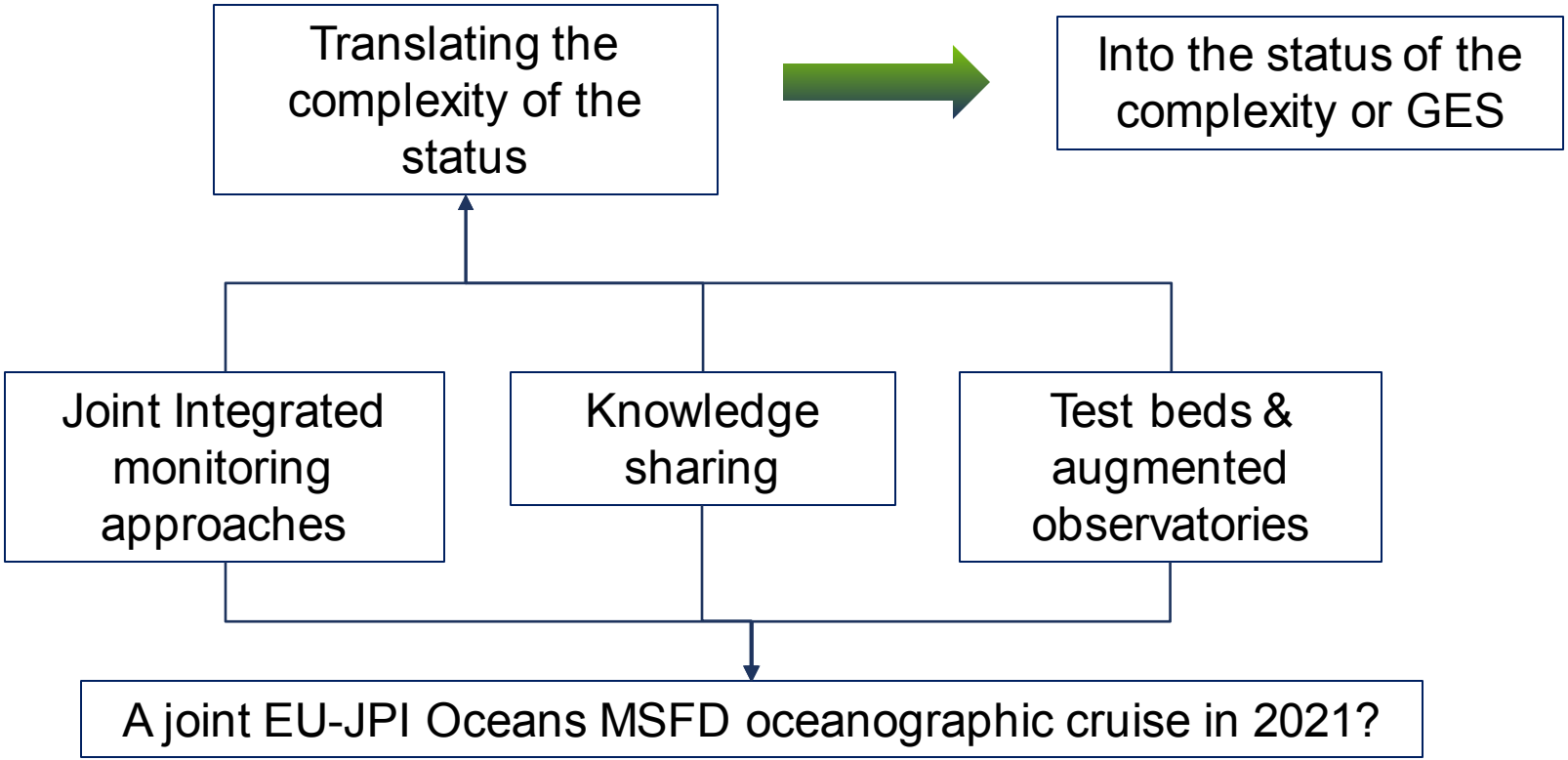
From large scale overarching patterns and observations

To in depth analysis of deviations and trends

Translating the complexity of the status

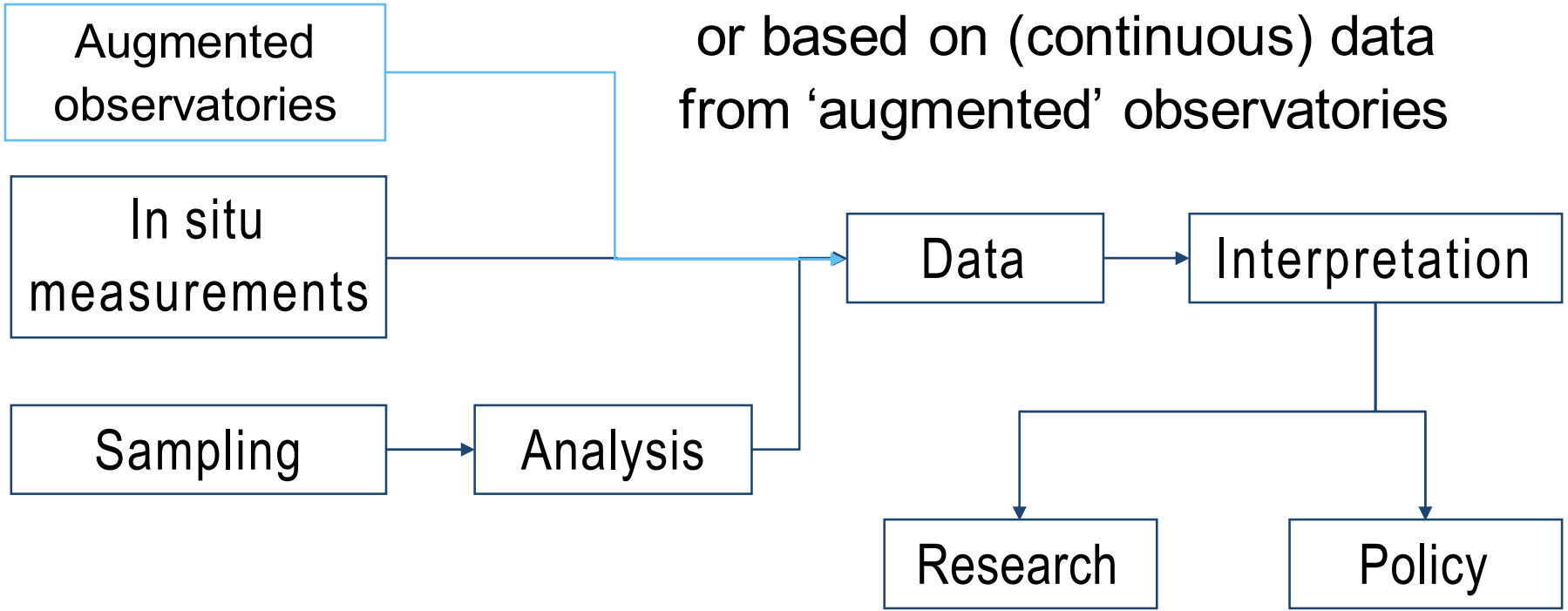
Into the status of the complexity or GES

The vision

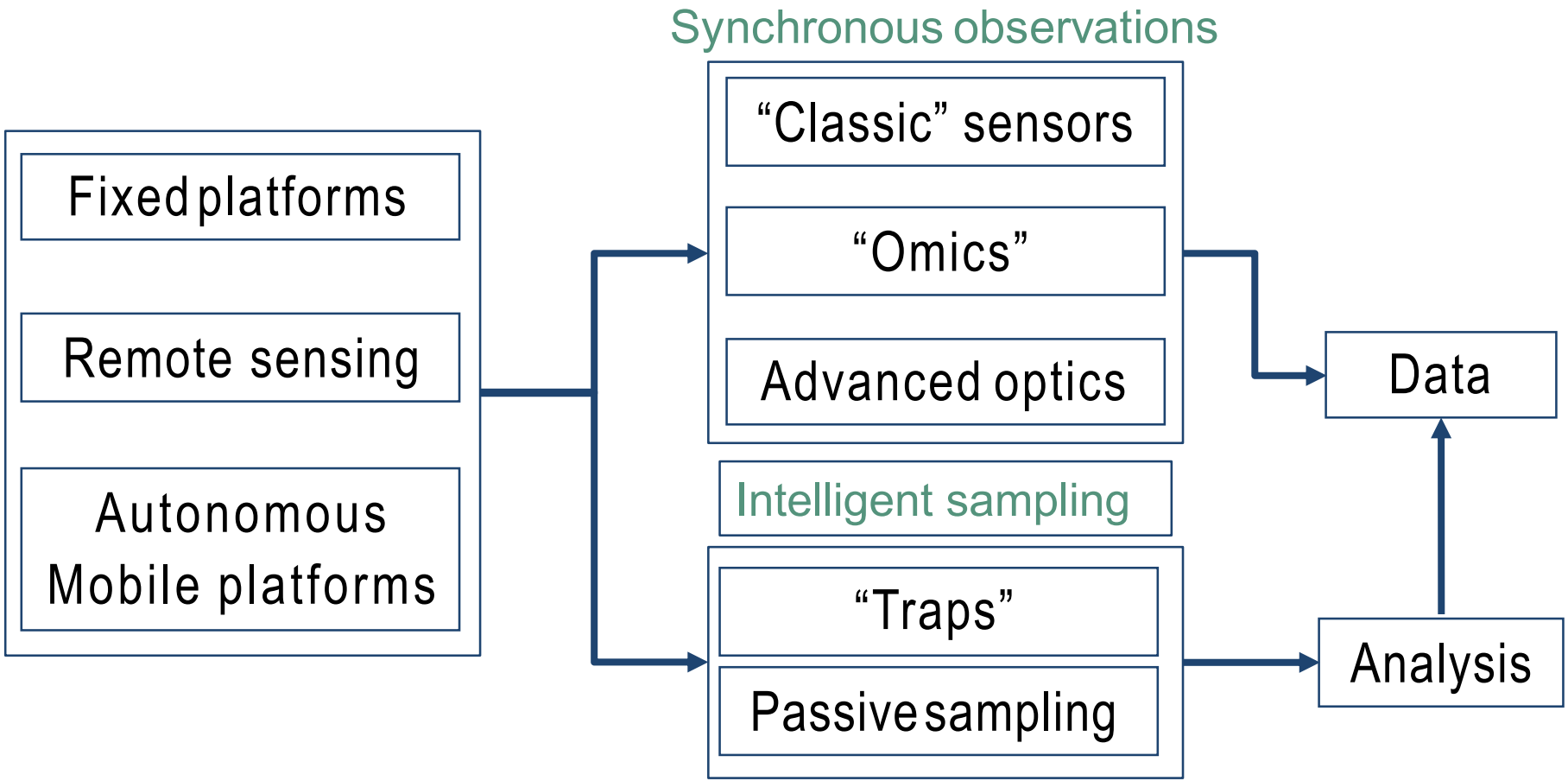

Translating the complexity of the status
Into the status of the complexity or GES
Joint Integrated monitoring approaches
Knowledge sharing
Test beds & augmented observatories
A joint EU-JPI Oceans MSFD oceanographic cruise in 2021?

What are we aiming for?

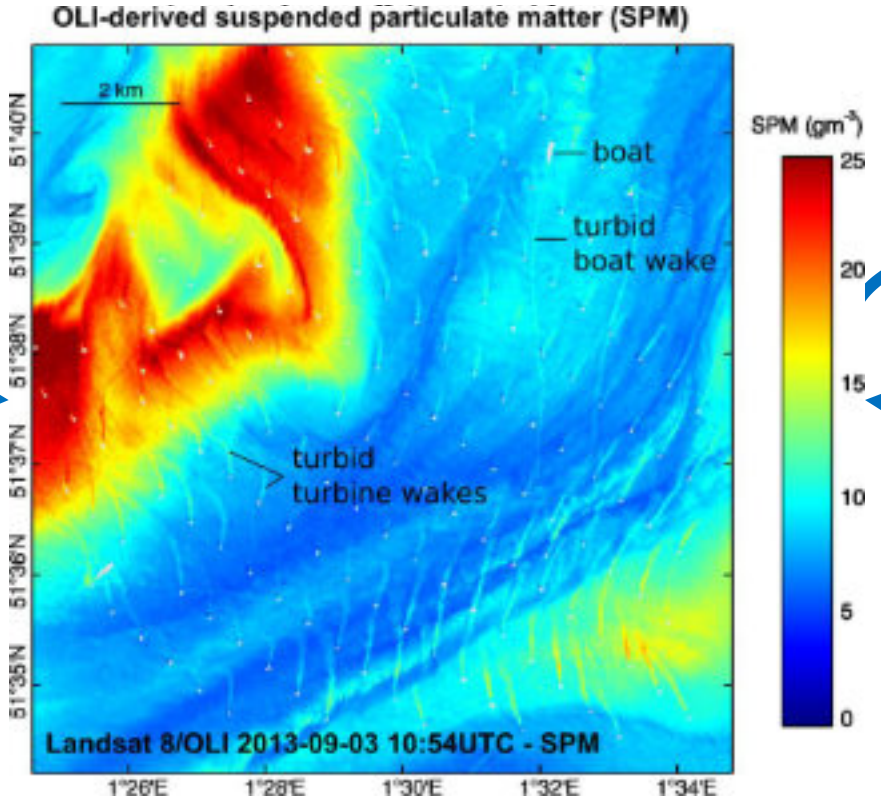
In situ observations combined with or based on (continuous) data from 'augmented' observatories



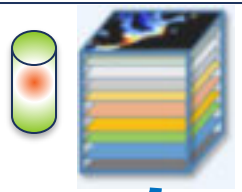
Augmented observatories



What are we aiming for: an example.



Big Data
Processing via algorithm



Vanhellemont, Q., Ruddick, K., (2014). "Turbid wakes associated with offshore wind turbines observed with Landsat 8", Remote Sensing of the Environment

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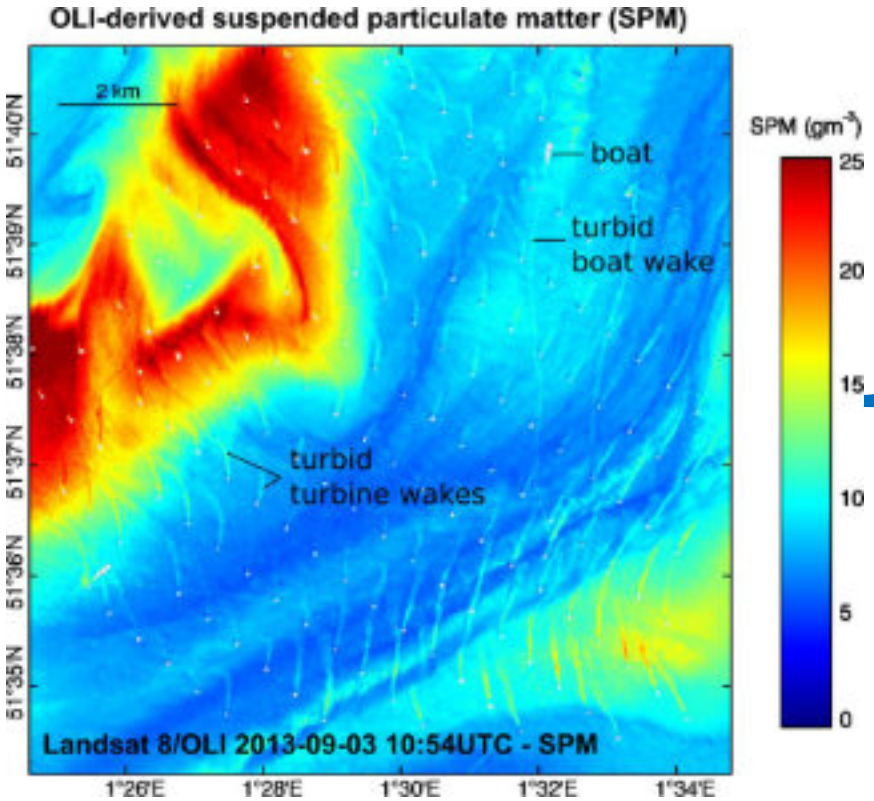

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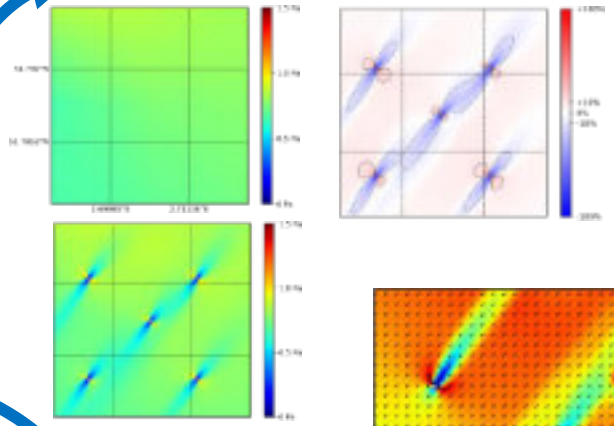
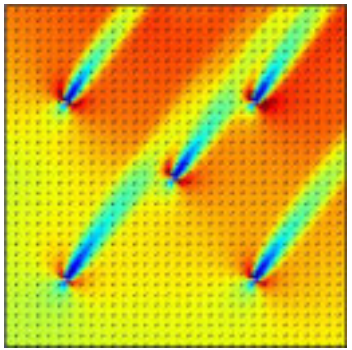
$$\langle \overrightarrow{\tau_b} \rangle = \frac{1}{t_2 - t_1} \int_{t_1}^{t_2} \overrightarrow{\tau_b}(x, y, t)\, dt$$

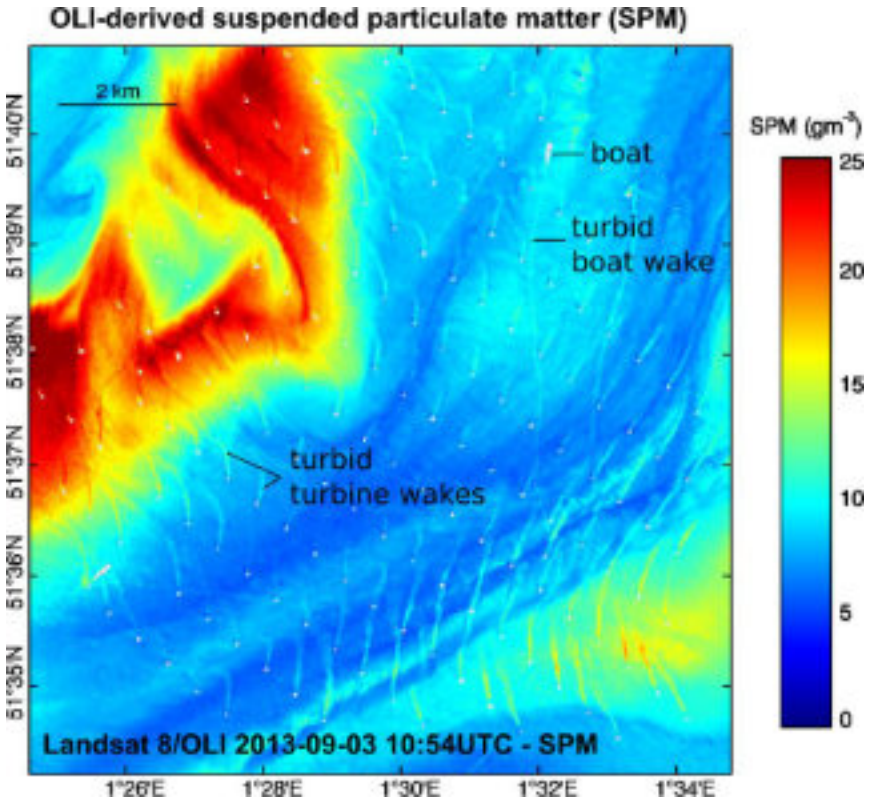


Ground truthing by sampling



A high resolution implementation of the COHERENS model to study the impact of the windmills pile on hydrodynamic

What are we aiming for: an example.



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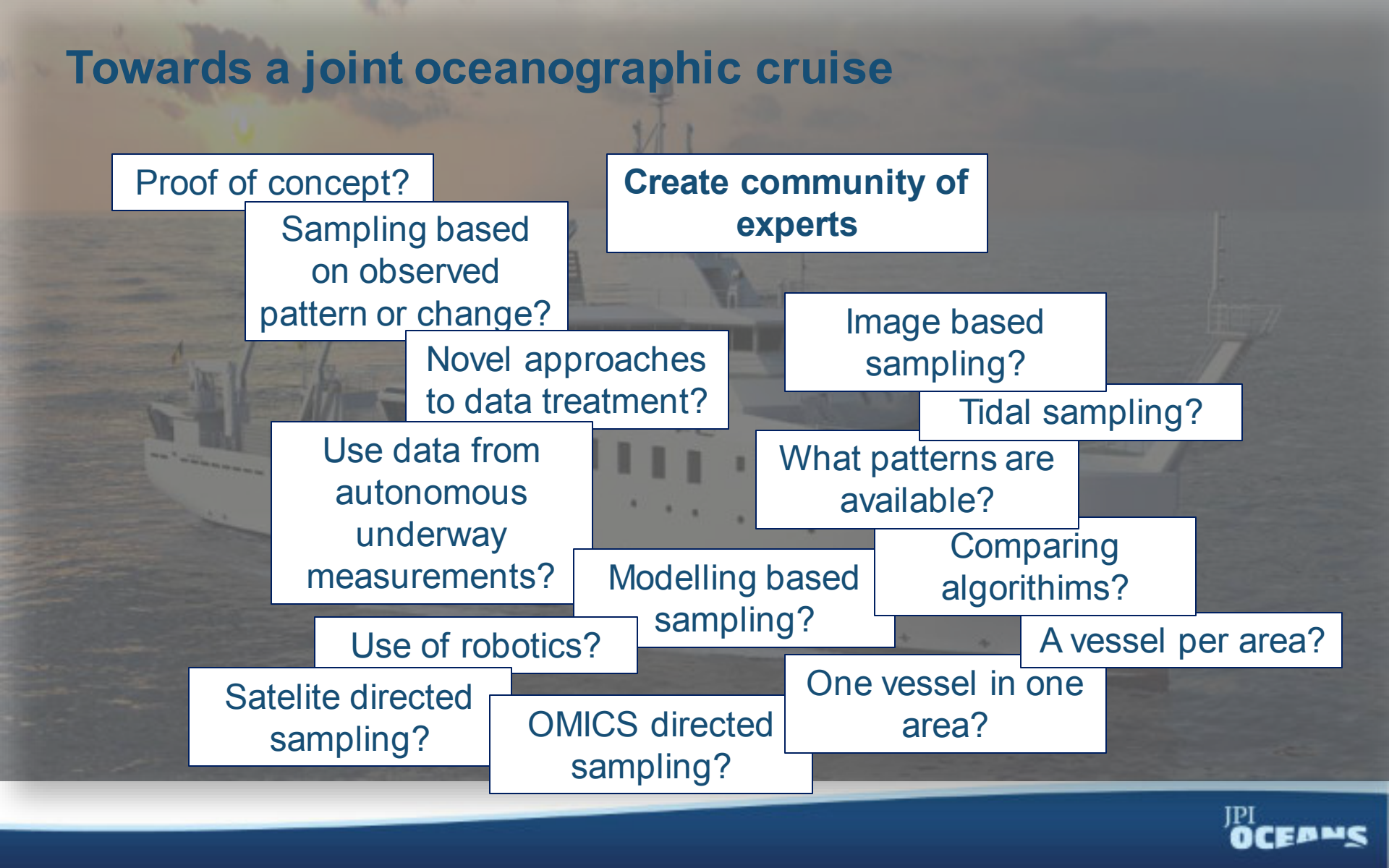
Impacts of turbid turbine plumes has been comprehensively reported in the Belgian MSFD assessments for Descriptor 7

Impact estimated at 0,066 km² / windmill pile

Belgische Staat, 2018. Actualisatie van de initiële beoordeling voor de Belgische mariene wateren. Kaderrichtlijn Mariene Strategie – Art 8 lid 1a & 1b. BMM, Federale Overheidsdienst Volksgezondheid, Veiligheid van de Voedselketen en Leefmilieu, Brussel, België, 243 pp.

Towards a joint oceanographic cruise



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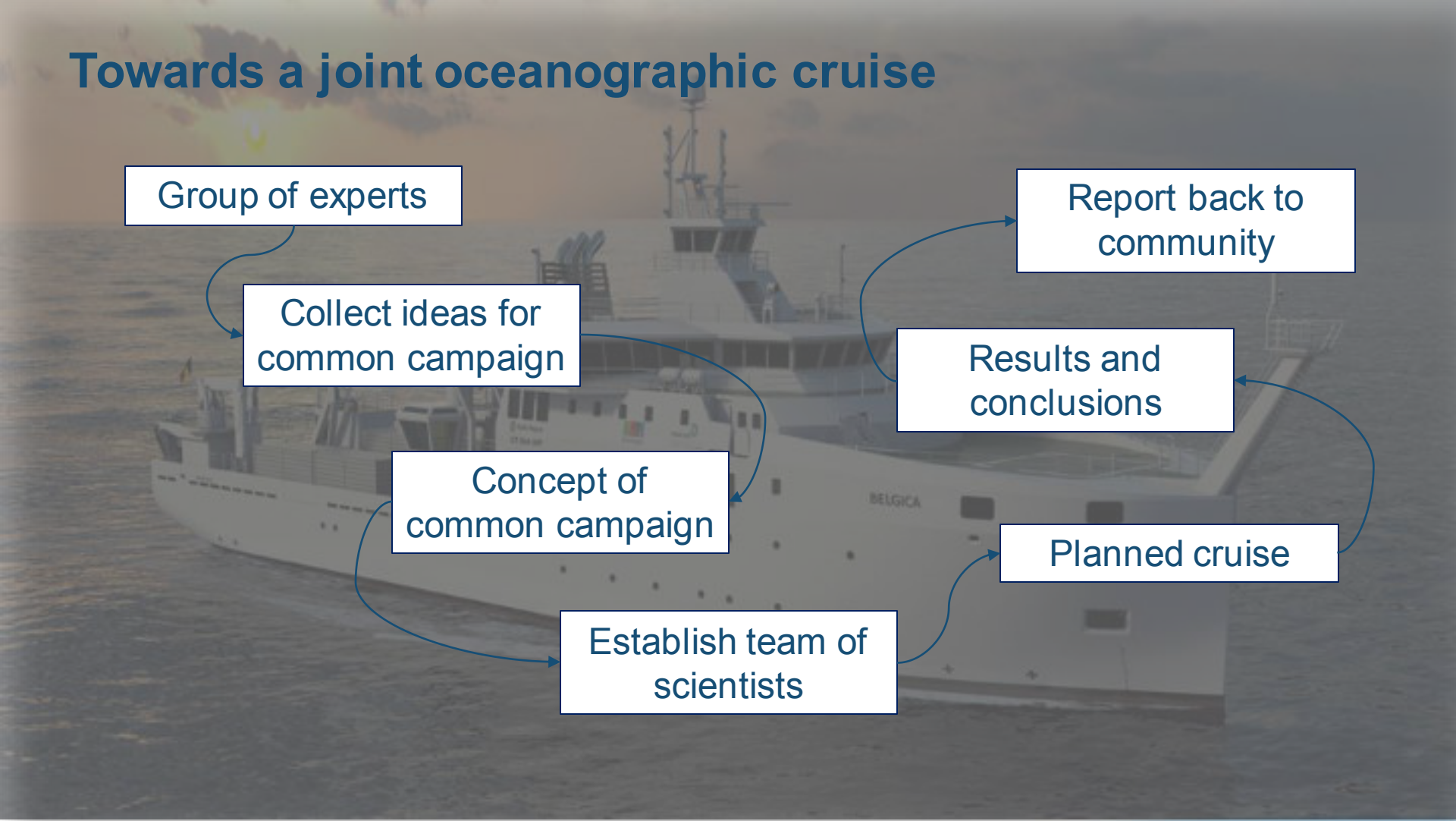
Towards a joint oceanographic cruise



To conclude

- Concept of proof: demonstrate what could work!
- Realistic, achievable, concrete, practical…
- Harmonise approcaches, methods, concepts…
- Important role of omics and data interpretation!
- Start of new approach to MSFD GES!
- See you at the next workshop!

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THANK YOU

WRAP-UP AND…SOME FINAL REMARKS

Mario Sprovieri
IAS-CNR, Italy

From a science-policy exchange of views…

«Please, we don't need philosophy…we need concrete and solid infos in order to implement, set-up and support the GES assessment of MSFD»

…and that's exactly what we are trying to do…this first workshop provided an inspiring **multidisciplinary scene** on which we may build to refine the 'definition' of GES to help in improving our assessment, as well as, targets …now our responsibility is to **distillate information, manage the learnt lessons and metabolise them in the context of the GES assessment**

- Very fruitful exercise to **share our knowledge** and **shaping new ideas** on how science is dealing with similar problems either in general and in other 'environments', and how it could **support a solid assessment of GES**, in its intrinsic and complex dimension

TAKE HOME MESSAGE (1)

The **GES is a 'complex affair'** and, even more, **MSFD,** deeply including socio-economic and political forcing, calls for a really multi- and interdisciplinary science job

A **clear emerging evidence**: it is crucial to 'expose' the MSFD community to an even wider spectrum of disciplines and scientific expertise to suitably capture the challenge of a comprehensive and convincing GES definition and assessment

The **GES remains the Holy Grail of the MSFD** and calls for multi- and interdisciplinary investigations and priority scientific efforts. The MSFD community needs to be actually and effectively open to the complexity of the investigated system

TAKE HOME MESSAGE (2)

…**there is also the problem of the colours…red or green?**

- sort of hyper-simplification of the system to support decisions. But to discriminate colours and then decide using thresholds (just beyond the metaphor) requires specific and dedicated reflection in the framework of a complex system where the **'mixture of colours'** dominate We have seen that many other scientific communities work around such a kind of similar problem and developed original/specific and robust approaches. And also the point of a healthy system is quite similar in other disciplines. **We must metabolize concepts and ideas, but we cannot escape the responsibility to 'define the colour'!**

…we also learnt that **data are not sufficient to estimate the evolution of the system in the future**.

- mainly from a theoretical point of view. **We need to identify the essential equations and models to properly manage numbers in the various contexts**. Semi-quantitative approaches, in robust model context, could offer a good way to capture the core of variability of the system with a good accuracy and robustness (although without a hyper-precision)

…and we discussed a bit around the **problem of the 'reference point' for the system functioning**

- anthropic impact significantly changed things and directly define the background of variable with pristine values is a chimera. We must elaborate on that point and **provide solid indications about the functioning of the marine ecosystem** in order to identify reliable trajectories of evolution in the near future

NEXT TRAJECTORIES AND STEPS OF THE S4GES JOINT ACTION

- Preparation of the **proceedings of the workshop** and circulation of the document within mid-/end of January 2021
  - about 1 page wrap-up of each presentation (important statements) and a robust reference list

- Organization of a meeting with the Group of Experts of S4GES and few additional experts to start a **discussion about science and logistics for the joint oceanographic cruise**
  - provisional date for the meeting: February 2021

- Launching of a Workshop dedicated to the specific issues/opportunities of **'augmented observatories for MSFD'** and the **'joint oceanographic cruise'**
  - provisional date: either June or September 2021

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THANK YOU

Mario Sprovieri