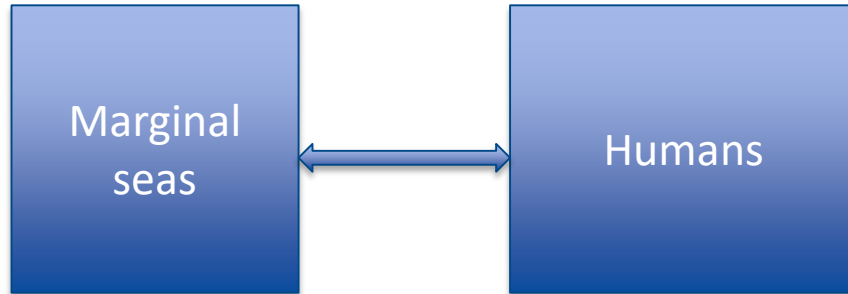


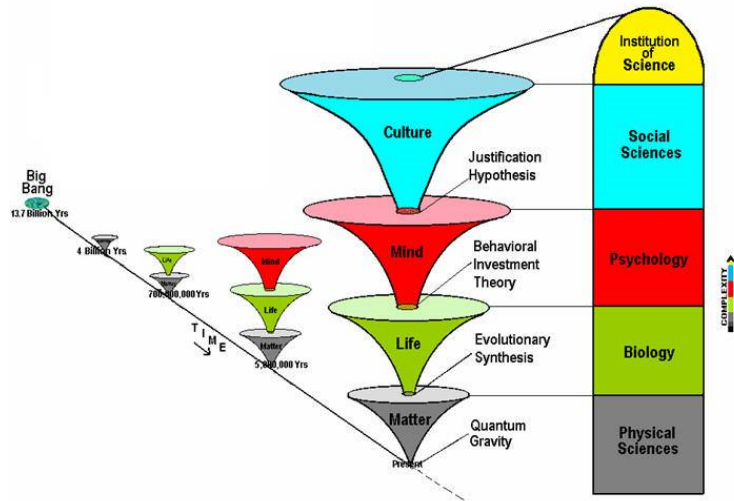
How to develop marginal sea system understanding connecting natural and human sciences?



Humans are an integral component of the marginal sea system. Large differences in time and space scales, culture and tradition.

Time perspective for Marginal Seas and Humans

Increasing body of knowledge and specialization



The tree of knowledge system by Gregg Henriques

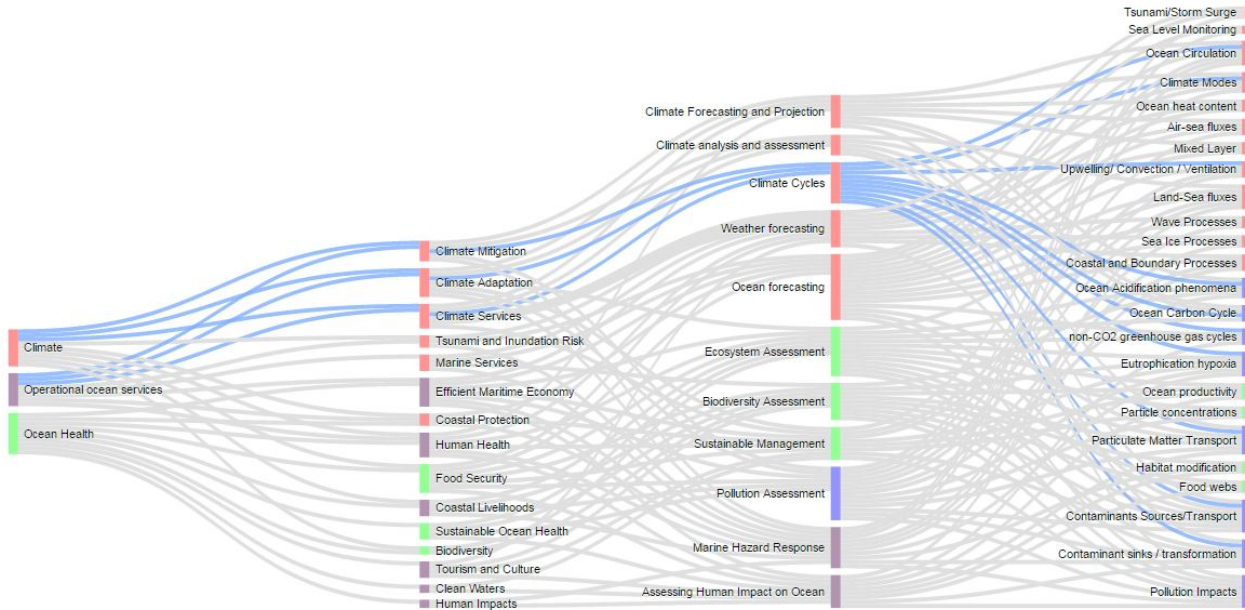


From Oxford Research Encyclopedias

Perceptions of the sea
from an unlimited
resource to a limit
resource in danger

Global Ocean Observation System (GOOS) strategic mapping tool

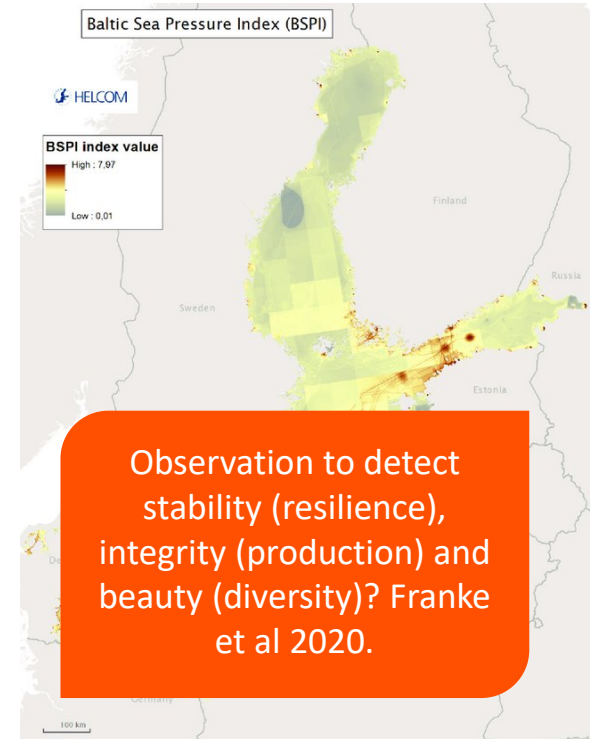
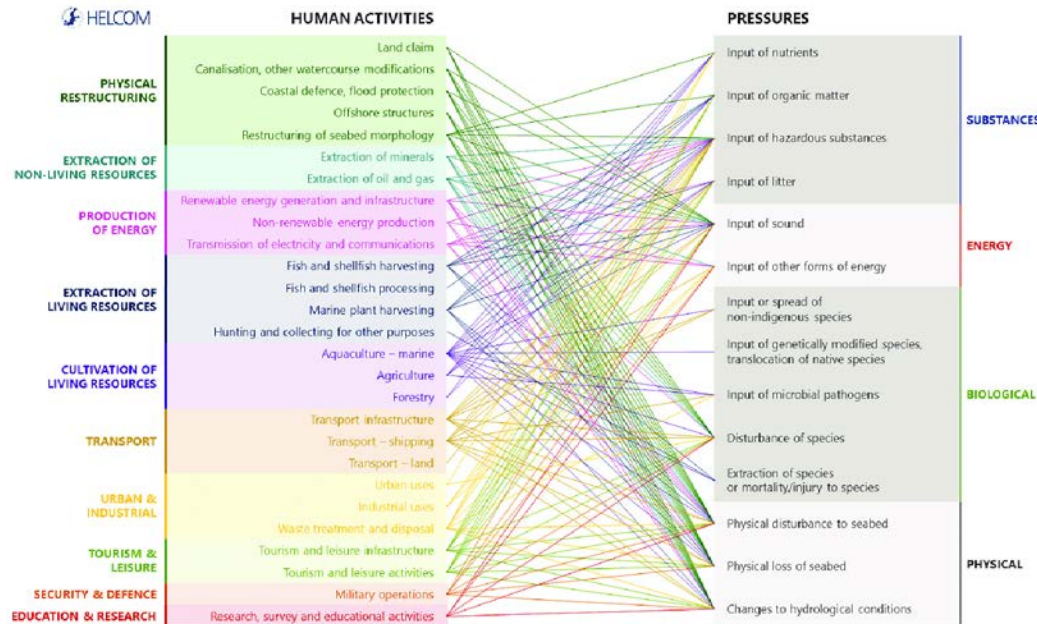
What kind of observations are needed?



The strong specialization in science gives no direction for ocean health.

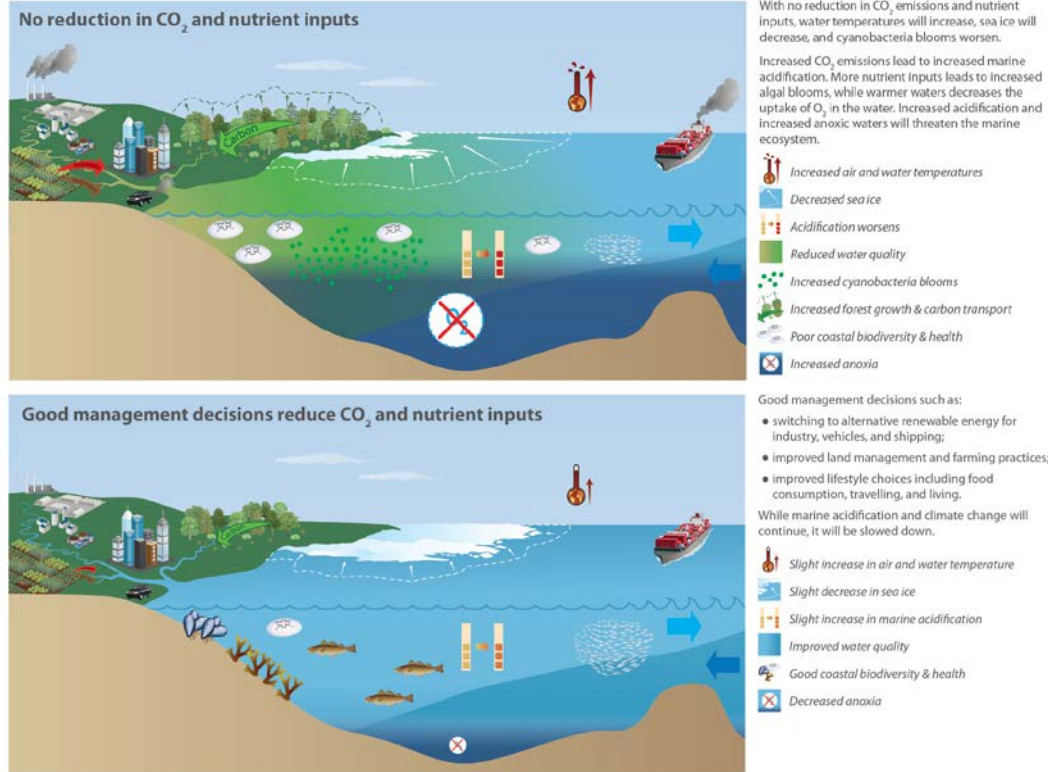
Human activities and environmental pressure are complex

What kind of behaviour changes are needed to improve marine health?





Future developments outlined by scientists



Science has much to learn from the arts when communicating findings

The BACC II Author Team (2015).
Symbols from <https://ian.umces.edu/>

Future developments outlined in the arts

Samuel Taylor Coleridge (1798)
The Rime of the Ancient Mariner:
Is about the how meaningless killing of an
albatross and what it brings in punishment,
death and isolation.

...

*The albatross follows on
The mariner kills the bird of good omen
His shipmates cry against what he's done
But when the fog clears, they justify him
And make themselves part of the crime*

...



Science and human science are two kinds of knowledge with different perspectives for a common pursuit of truth. Together they describes facts and values.

Progress but how?

More facts are needed but not enough for change



- Shame
- Isolation
- Dystopi
- Fear
- Alienation
- Chaos
- Envy
- Illness
- ..



- Inspiration
- Vision
- Courage
- Curiosity
- Harmony
- Hope
- Health
- Simplicity
- Cooperation
- ..

Letting people know the environmental impact of their own behaviours has had little effect on changing behaviours.
Letting people know what others around them do has been shown to be more effective (Jachimowicz et al, 2018).



Processes fostering progress or deterioration

How can health in the society and in marginal seas change?



Processes for progress¹⁾

- Goal 1: No poverty
- Goal 2: Zero hunger
- Goal 3: Good health and well-being
- Goal 4: Quality education
- Goal 5: Gender equality
- Goal 6: Clean water and sanitation
- Goal 7: Affordable and clean energy
- Goal 8: Decent work and economic growth
- Goal 9: Industry, innovation and infrastructure
- Goal 10: Reduced inequality
- Goal 11: Sustainable cities and communities
- Goal 12: Responsible consumption and production
- Goal 13: Climate action
- Goal 14: Life below water
- Goal 15: Life on land
- Goal 16: Peace and justice strong institutions
- Goal 17: Partnerships to achieve the goals

Humans

Physical and mental
health

Processes for deterioration

- Aimless 1: Poverty
- Aimless 2: Starving
- Aimless 3: Illness and distress
- Aimless 4: Bad education
- Aimless 5: Gender discrimination
- Aimless 6: Dirty water and unsanitary
- Aimless 7: Expensive fossil and nuclear energy
- Aimless 8: Improper work and recession
- Aimless 9: Decline in industry, innovation and infrastructure
- Aimless 10: Increased inequality
- Aimless 11: Fragile cities and communities
- Aimless 12: Over consumption and production
- Aimless 13: No climate action
- Aimless 14: Failing managements of water
- Aimless 15: Failing managements of land
- Aimless 16: War and fragmentation of institutions
- Aimless 17: Increased antagonism and alienation

1) United Nations Sustainable Development Goals

A healthy marginal sea is only possible when humans and the sea are in harmony, and that's depends on how we interact.

A Roadmap for United Nations Decade of Ocean Sciences for Sustainable Development.....(Claudet et al 2020)

Strategies recommended to includes:

1. Stronger science integration (goes slow)
2. Ocean-observation systems (suitable data to support good science)
3. Improved science-policy interfaces (science diplomacy and communication)
4. New partnerships supported by:
5. A new ocean-climate finance system
6. Improved ocean literacy and education (to modify social norms and behaviours)

Ocean literacy is defined as an understanding of the ocean's influence on you, and your influence on the ocean (UNESCO Literacy Portal)

Food for thoughts

Alencar et al (2020). Circles of Coastal Sustainability (CCS)

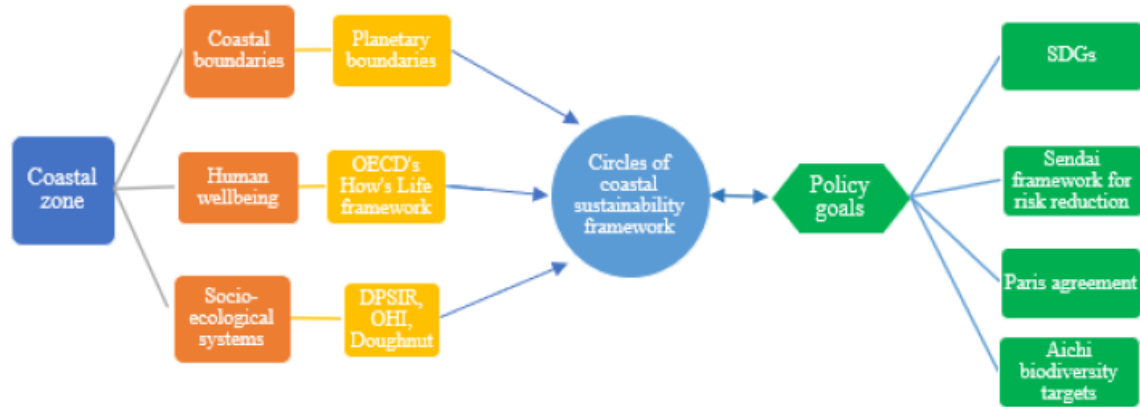


Figure 1. Framework organization summary. The framework is represented in the center; on the left side is the transdisciplinary content that it intends to include in the assessment, as well as the frameworks used in its creation, and on the right side is the policy goal that it is based on.

CCS brings together Environment and Ecology, Social and Culture, Economics, Governance and Policy.



Some conclusions

- A strong need to change human's relation toward the ocean and the marginal seas.
- Science and human science are two kinds of knowledge with different perspectives for a common pursuit of truth.
- In marginal sea system science humans play an important role and arts remind us about human values and support creativity.
- Connecting science and the arts can increase awareness of the state of the sea and support behavioural change.
- Transdisciplinary require training in broad thinking and communication.
- Need for natural science to open the human box adding values to facts.

Thanks for listening!

Claudet, J., Bopp, L., Cheung, W.W.L., et al., (2020). A roadmap for using the UN Decade of Ocean Science for sustainable development in support of science, policy, and action., *One Earth* 2, Jan 24, 2020, 1-9.

De Alencar, N,M,P, Tissier, M,L, Paterson S,K., and A. Newton (2020). Circles of Coastal Sustainability: A Framework for Coastal Managements. *Sustainability* 2020, 12, 4886; doi:10.3390/su12124886

Franke., A., Blenckner, T., Duarte, C. M., et al., (2020). Operationalizing Ocean Health: Towards integrated research on ocean health and recovery to achieve ocean sustainability. *One Earth*, 2, June 19, 2020, 1-9.

Omstedt, A. (2020). *A Philosophic View of the Ocean and Humanity*. Springer Nature, ISBN 978-3-030-36679-7, <https://doi.org/10.1007/978-3-030-36680-3>.

