

A Day in the Life of an Ecosystem



Learn to **See with the Sea!**

Ecosystem learning for field support:
A tool for organizational practices

What is an ecosystem?

Ecosystems in the natural world: A community of diverse and interdependent living organisms in conjunction with the physical environment. Despite fluctuations in populations and disturbances in their environment, ecosystems tend towards ecological stability, or equilibrium.

Ecosystems through a human lens: Also known as “socio-ecological systems”, where diverse and interconnected actors are intricately tied by cultural practices, identities, intentions, roles, beliefs, values, and available resources.

This tool helps you learn to see the ecosystem you care for through the lens of the Sea.



By exploring marine ecosystems, it broadens your perspective, reveals signs of (un)health, and supports you as a field supporter to understand and act together for a healthier ecosystem.

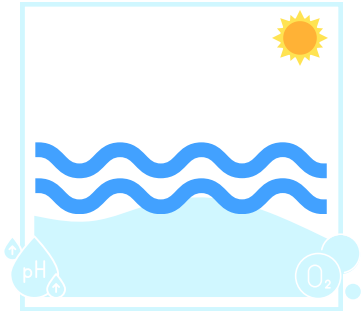
Credits: "A Day in the Life of an Ecosystem: Learn to See with The Sea" is a tool developed by Farah Makki & Naomi Martin in the framework of the program "Culture in the Civic Space in the MENA region: Learning Journey for Field Supporters" implemented by International Alumni Center gGmbH (iac Berlin) and supported by the Ford Foundation. Drawing on "Ecosystem Cards" for inspiration, the tool has been developed and tested in the program's kick-off event. This work is licensed under the Creative Commons (CC BY-SA 4.0).



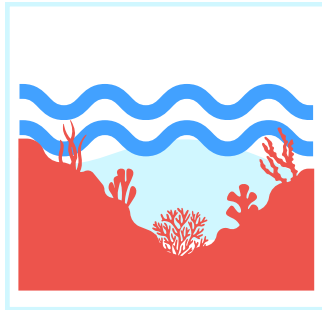
ISBN 978-3-9827637-1-2

Learn to See with the Sea!

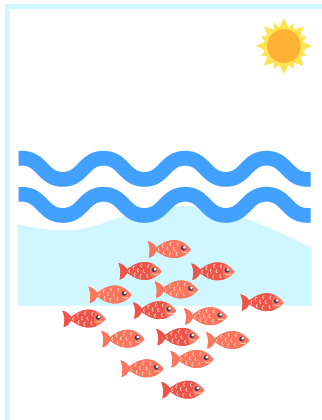
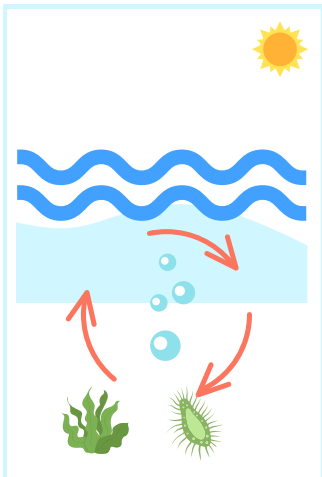
Dive into the water through these visual cards to explore ecosystem dynamics. At the back of every card, you will find questions to explore the ecosystems you are a part of through “marine” eyes.



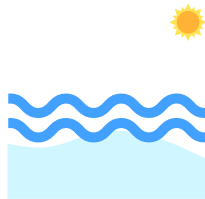
**Water Conditions,
Habitats**



Resources, Biodiversity



The cards will take through exercises of



Understanding



Sensemaking

*Inspiring your
(learning) journey!*



Envisioning

How to use this tool?

Ecosystem Journal

pp. 6-50

Each card holds a question, or a set of questions, to guide your reflection, whether you're journaling on your own or exploring ideas in conversation with your team.

*Complementary materials on
"Unexpected interactions" pp. 59-69*



Learning Journey & Experimentation Cards

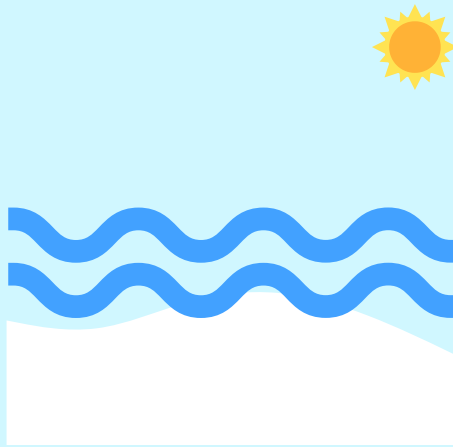
pp. 51-58

After you've moved through the three phases of "understanding", "sensemaking" and "envisioning", you can turn to the learning journey and experimentation cards to go deeper and shape your next steps.

Facilitation Tips

pp. 52-53

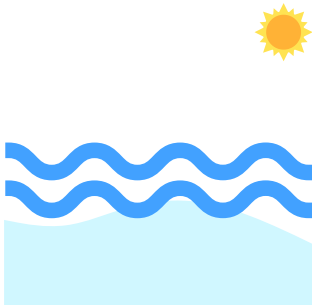
We have prepared some facilitation tips to help you make it all flow smoothly.



Understanding

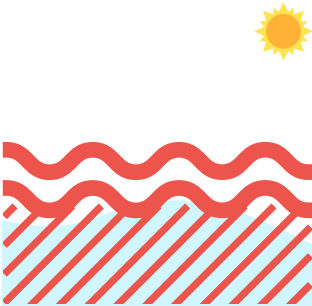
Balance

Water is essential for life, and the balance between key elements determines whether life is flourishing, struggling or somewhere in between. Explore the different states of balance in marine environments and how they affect life:



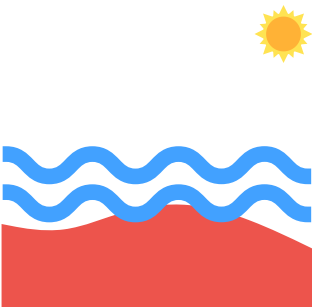
In balance

Optimal conditions for life to flourish.



So-so

The balance becomes disturbed, with some life forms negatively affected.



Out of balance

Harsh conditions, making it a struggle to survive.

Balance

You might be wondering: What supports balance in water? We'll explore this question and uncover answers in the next cards.

For now, return to the ecosystem you are a part of:

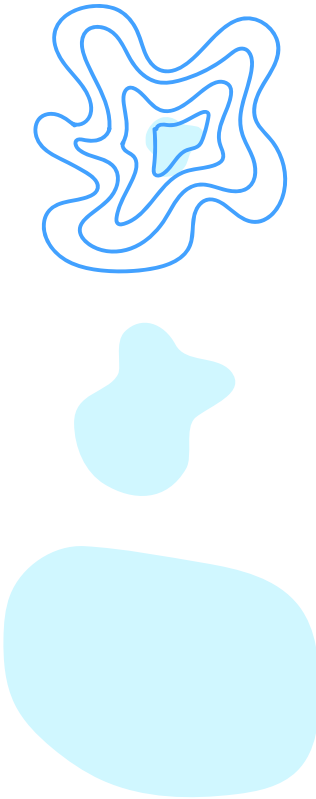
- How would you describe its current state?
- Does it feel like things are flourishing, struggling, or somewhere in between?

In balance

So-so

Out of balance

Positionality & Boundaries

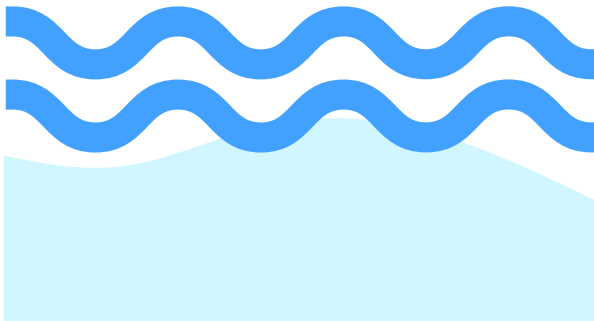


Water ecosystems have different characteristics depending on whether we are looking at seas, rivers, or oceans. In all cases, their geographic location and natural boundaries can greatly affect the balance of factors that determine which life forms can flourish. For example, the Dead Sea's unique location and boundaries lead to high salinity levels, limiting its ability to support marine life.

Positionality & Boundaries

- Name the ecosystem you are a part of (and care for).
- What is at the core of the ecosystem?
- Where are the boundaries?

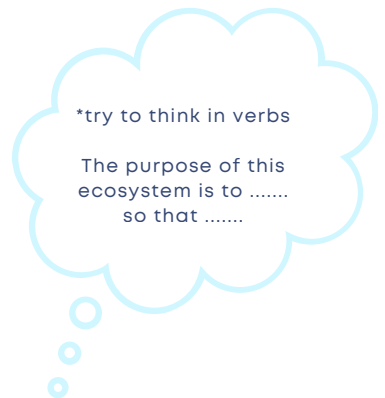
Purpose



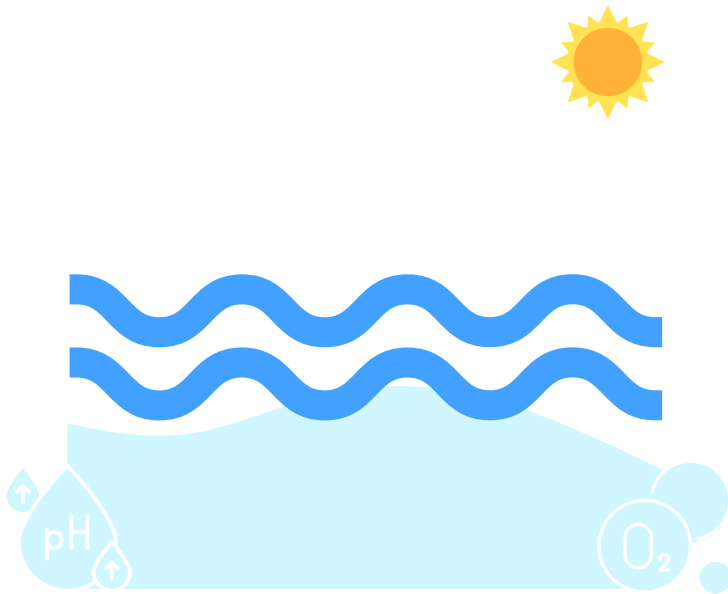
The purpose of the marine ecosystem is to sustain life (both in the water and beyond) by maintaining the health and resilience of the water environment. This includes supporting diverse marine life, regulating the climate, and providing resources such as food and oxygen. A healthy marine ecosystem helps ensure that the many different species that rely on it can thrive and live in ecological balance.

Purpose

- What is the purpose* of the ecosystem you are a part of?
- Whom does it serve?
- Whom does it not serve?



Conditions for life



Conditions for life depend on several key aspects of water chemistry:

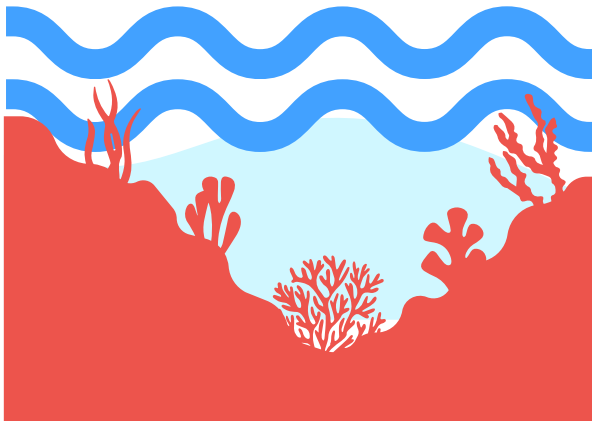
- **Salinity:** The salt content of the water determines which organisms can survive. Some species are adapted to freshwater, while others thrive in salty environments.
- **Dissolved Oxygen:** Aquatic animals and plants need enough dissolved oxygen in the water to breathe.
- **pH Levels:** The acidity of the water affects chemical reactions and biological processes. Most aquatic organisms require a stable pH level to remain healthy.

Sensing the water(s) you are swimming in

- How does the “water” around you feel? Is it dense or light, salty or fresh, stable or unstable? Is it easy or difficult to breathe?
- What is the pace of life? Does the water feel calm, turbulent, or somewhere in between?
- How do you sense others in this ecosystem? How do they move through the water?

Conditions for life

Habitat(s)



Marine ecosystems are also shaped by physical factors like temperature, light, tides, currents, and the type of sea floor (substrate). Temperature affects how species grow and where they live. Light helps plants make food through photosynthesis. Tides and currents move nutrients and species around. The sea floor's substrate (whether it is sandy, rocky, or muddy) provides different habitats for marine species, giving them places to live, eat, and reproduce.



*Let's see what provides
habitat(s), swim with me!*

Habitats & Infrastructure

You will find marine life in a variety of habitats, each tailored to the species it supports. Natural infrastructure—like coral reefs and mangroves—provides shelter and places for reproduction, helping certain species flourish.

Seaweed



Clusters of seaweed not only provide shelter for certain species but also produce nutrients essential to the marine food web.

Coral reefs



Biodiverse underwater structures formed by coral polyps that provide habitat for a myriad of marine species.

Mangroves



Coastal forests that stabilize shorelines, provide habitat, and act as nurseries.

Deep Sea

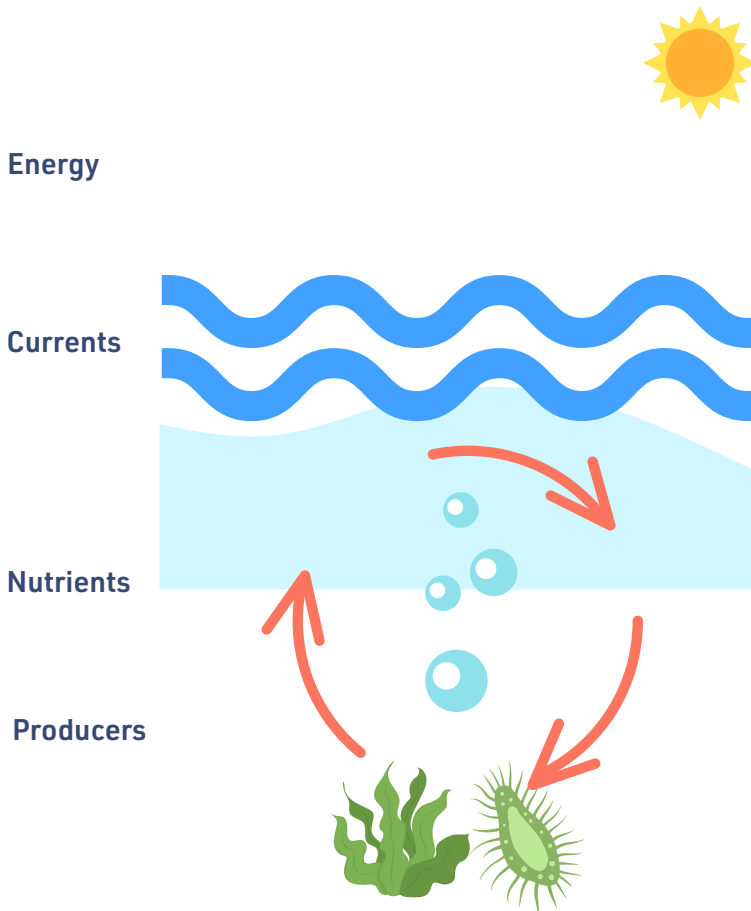


The abyssal and hadal zones are home to specialized organisms adapted to high pressure, low light, and cold temperatures.

Habitats & Infrastructure

- What habitats and infrastructure exist in the ecosystem you are a part of?
- How well do these support the actors and communities needing them?
- Where are habitats and infrastructure lacking?

Resources for life

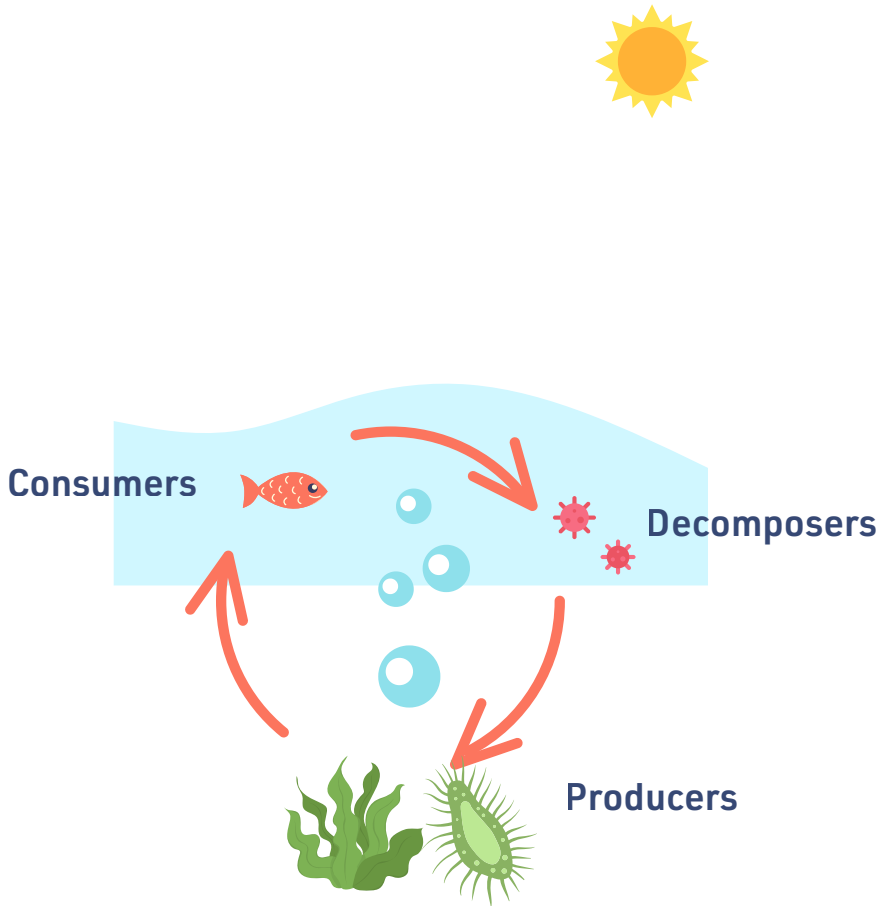


Marine ecosystems rely on essential resources like sunlight for energy, currents to distribute nutrients, and primary producers to sustain life. Key nutrients, such as nitrogen, phosphorus, and silicon, support the growth of these producers, forming the foundation of the food chain and ensuring the ecosystem's vitality.

*Let's learn about the
relation between
resources and cycles*



Cycles for life



Ecosystems are sustained by continuous cycles of energy, nutrients, and resources. Producers (such as plants and algae) create energy from sunlight, consumers (such as marine species) rely on these producers for food, and decomposers (microorganisms) break down waste and dead matter, returning nutrients to the system. When in balance, this closed loop keeps resources flowing and supports life.

Resources & Cycles

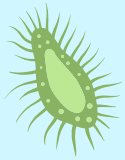
Coming back to the ecosystem you care for:

- What tangible and intangible resources are currently in use in the ecosystem?
- Where do these resources come from? Are they generated internally or sourced externally?
- How well do resources flow and regenerate within your ecosystem? Are they accessible to everyone who needs them?
- What resources or flows are missing that could help your ecosystem thrive?

Actors & Roles

biodiversity

Actors in the marine ecosystem influence resources & cycles. They play different roles such as:



Phytoplankton



Seaweed

Producers

Producers are able to make their own food. Just like producers on land, producers in the marine environment convert energy from the sun into food through photosynthesis.

Decomposers

Bacteria are microscopic organisms that break down dead organic matter and, in doing so, release nutrients back into the ecosystem. They help support all levels of the food web, including consumers, by decomposing their waste and dead tissue.

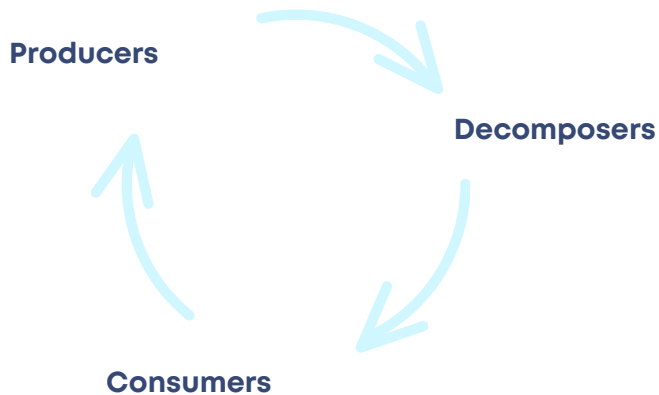
Consumers

Consumers are unable to make their own food, relying on either consuming other organisms or absorbing dissolved organic material. These include a wide range of marine species, from fish and mammals to starfish and cockles.



Biodiversity of Actors

Do these actors trigger any associations with the actors in the ecosystem you are trying to understand?



Biodiversity of Roles



Light in the
dark



Nutrients
recycling



Oxygen
balance



Species health



Habitat
restoration



Shelter & source of
nutrients and energy

Many species, besides being decomposers, producers, or consumers, have additional roles that play a unique part in sustaining life. Some provide light in dark environments, while others provide shelter, restore habitats, or balance oxygen levels in the water. There are even some species that support the health of others, ensuring the entire ecosystem thrives.

This biodiversity of supportive roles is key to a thriving ecosystem.

Biodiversity of Roles

Do these actors trigger any associations with the ecosystem you are trying to understand?



Nutrients recycling

Bacteria support all levels of the food web by decomposing waste and dead tissue, thereby releasing nutrients back into the ecosystem.



Bring light in the deep dark sea

In the deep sea, where sunlight doesn't penetrate, some species use bioluminescence for communication, mating, and camouflage.



Restore habitat

Sea otters help protect kelp forests and the species living there by eating and, thereby, controlling the number of sea urchins, which would otherwise eat too much kelp.



Shelter, source of nutrients & energy

Clusters of seaweed not only provide shelter for certain species but also produce nutrients essential to the marine food web.



Balance oxygen in the water

Cockles clean the water, which helps prevent an overgrowth of some producers like phytoplankton, which can deplete oxygen and harm fish.



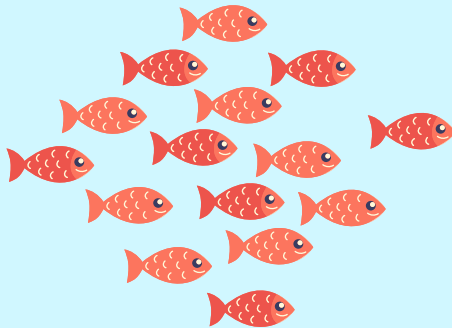
Contribute to other species health

Certain fish species, like cleaner wrasses, set up "cleaning stations" where larger fish (clients) come to have parasites and dead skin removed.

Actor(s) & Roles for life



*Inspired by the marine species?
Ready to think about actors and roles in
the ecosystem you're swimming in?*



Let's explore...

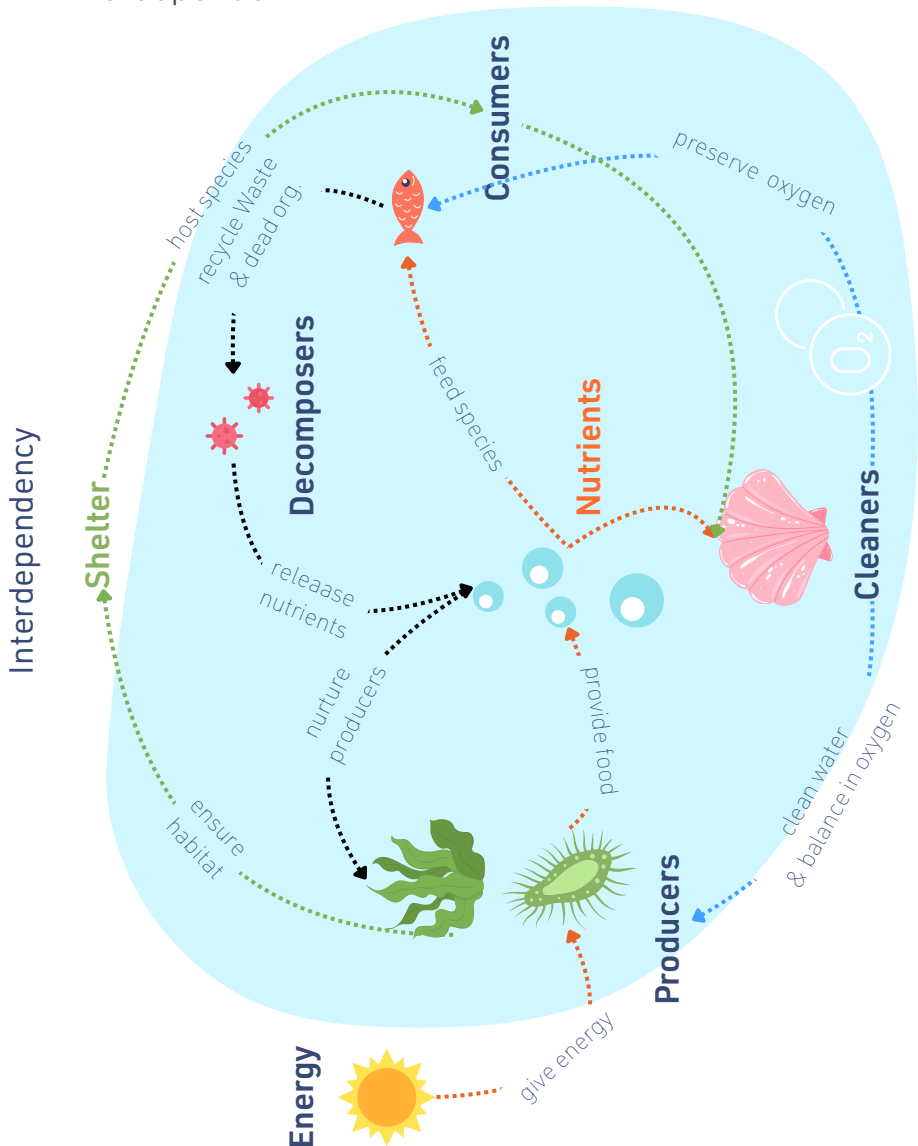
Actor(s) & Roles

Following your insights from the marine ecosystem:

- Who are the key actors and what roles do they play in the ecosystem you are a part of?
- How effectively are these roles being fulfilled?
- Are there any actors or roles missing in the ecosystem?
- How would you define your role(s)?

Connections & Relations

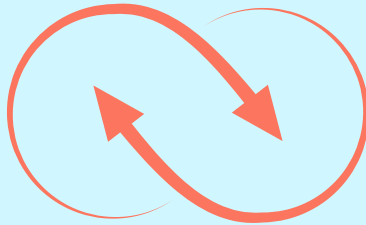
In the marine ecosystem, species interact in complex ways to fulfill their own needs and maintain balance. Actors, roles, and ecosystem functions are interdependent.



**Where can interactions
affect balance?**



Connections & Relationships



How species interact affects the ecosystem's balance in different ways:

- **Food Webs:** Species have specific roles, from producers to consumers, that together form a network of interactions that sustain life.
- **Symbiosis:** Mutualistic relationships show how cooperation benefits all involved. For example, cleaner fish remove parasites from larger fish, providing the cleaner fish with food and improving the health of the larger fish.
- **Nutrient Recycling:** Essential nutrients are recycled through various processes, helping maintain the ecosystem's health and productivity.
- **Adaptation:** Species adapt to environmental changes, reflecting the evolving nature of ecosystems. For example, some coral species are adapting to rising sea temperatures by forming symbiotic relationships with heat-tolerant algae. This helps them to survive in warmer waters and continue to provide shelter.

Connections & Relationships

- What connections currently exist between actors in the ecosystem?
- How would you describe the relationships between actors? What types of relationships exist for what purposes? What qualities do they have?
- How does power show up?
- What connections and relationships are missing?

Rules & Norms



Formal regulations and informal practices by humans also shape the marine ecosystem. Rules include legal protections such as fishing quotas, marine protected areas, and pollution controls. Informal norms include practices, community stewardship, and cultural traditions that promote responsible behavior.

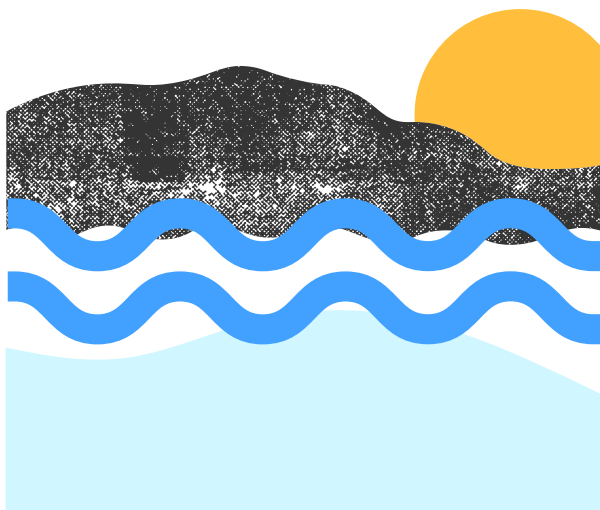
Rules & Norms

Just like in a marine ecosystem, the ecosystems we are a part of also have their own rules and norms (both explicit and implicit) that influence how the ecosystem develops over time.

Looking at the ecosystem you are a part of:

- What rules and norms affect how it functions?
- What are the core principles governing interactions and dynamics?
- How much influence do different actors have over the rules, norms, and principles that affect them?

Wider Context



Wider Context

The wider context around an ecosystem can influence its internal dynamics, either supporting or disrupting balance in:

- Water conditions
- Food webs
- Resource cycles
- Symbiotic relationships
- Habitats and infrastructure

Understanding and trying to work with these factors, even if they are not easy to influence, can help maintain the balance and health of marine ecosystems.



Wider Context

Factors of imbalance

Removing key species can collapse food webs, leading to the decline of other species and disrupting the balance in the ecosystem.

Overfishing



Toxic introductions

Contaminants can damage habitats and/or interfere with the flow of nutrients, affecting food webs and the overall health of the ecosystem.

Invasive species

Non-native species can outcompete or prey on native species, altering food web dynamics.

Wider Context

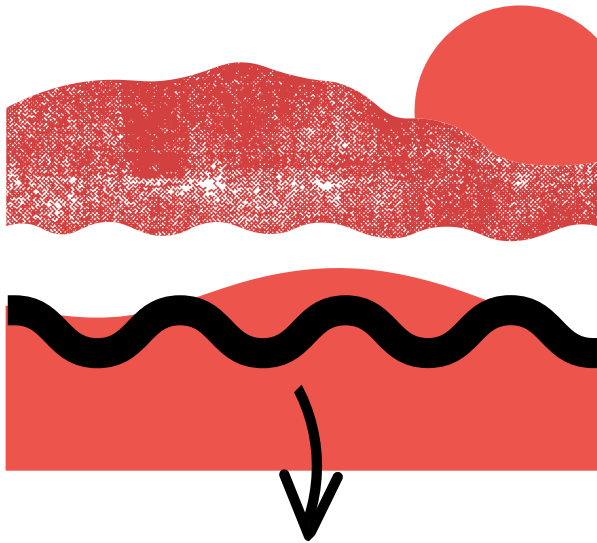
Factors of imbalance

Looking at factors that disrupt balance in the marine ecosystem, does it trigger any associations with the ecosystem you are trying to understand?



Wider Context

An example from the Dead Sea

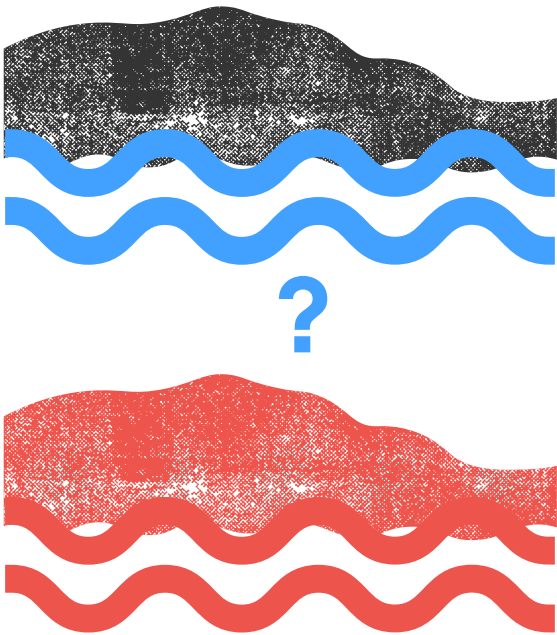


Climate Change: Rapid temperature changes can alter water quality and hinder species' ability to adapt, affecting how the ecosystem functions and which species are able to survive. The Dead Sea, for example, is shrinking by 1 meter each year, increasing its water salinity and density.

*Does it trigger any associations with the ecosystem
you are trying to understand?*

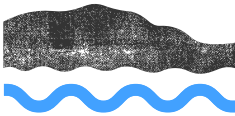


Wider Context

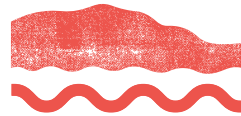


Wider Context

- *What external factors* affect or are likely to affect balance within the ecosystem? And how?*
(social, political, economic, environmental, technological)



More
Supportive factors



Less
Supportive factors



What bright spots do you see that point to more promising approaches?

Deep Sea

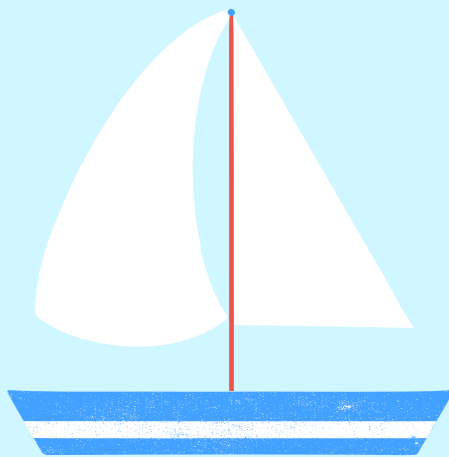
Values & Core Beliefs



Deep Sea Values & Core Beliefs

The values and core beliefs we hold about ourselves, others, and the world around us are deeply embedded in our ecosystems. Exploring the deep sea can help us uncover these underlying attitudes and behaviors that influence the ecosystem.

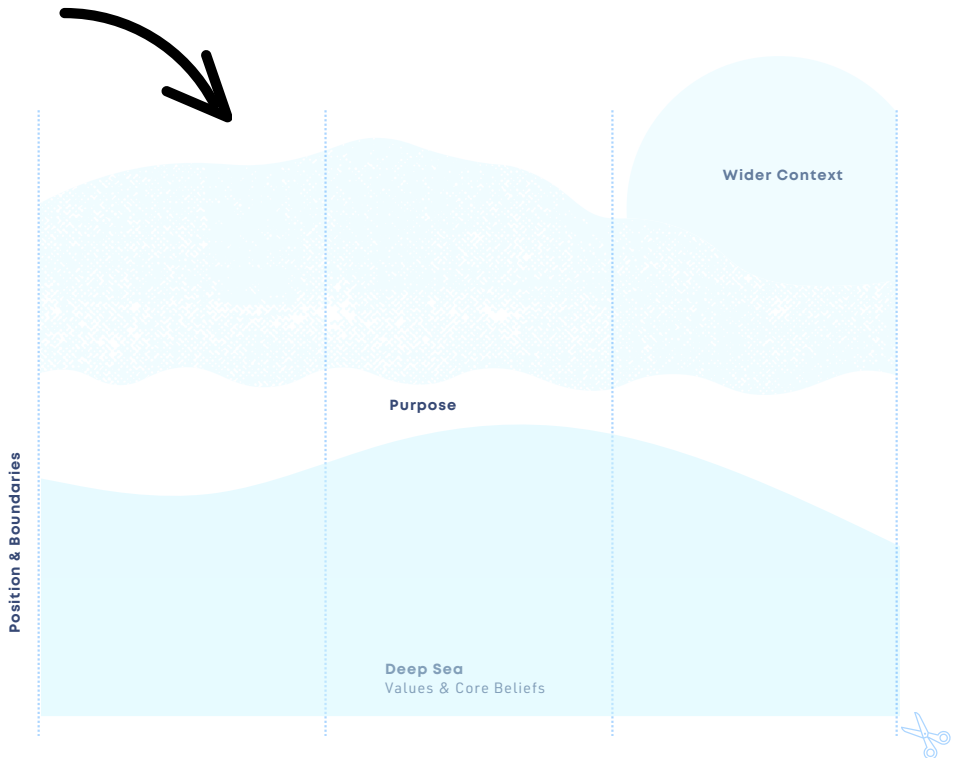
- What prevailing narratives exist in the ecosystem?
- What core beliefs and values lie beneath these narratives?
- What deeper truths and needs exist beneath the stories, values, and beliefs that shape the ecosystem?



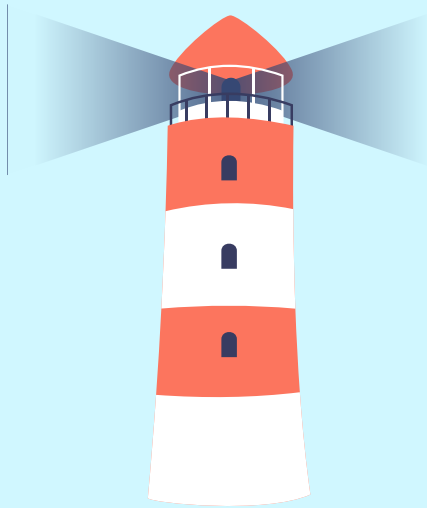
Sensemaking

Sensemaking

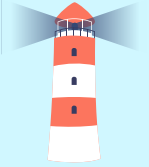
A larger version of this canvas is available to document your observations and share them with your peers and team.



- What are you learning about the current state of the ecosystem? What patterns or themes are emerging?
- How do you understand your current role(s) and position within the ecosystem?
- Where do you sense the urgency or potential for change?



Envisioning

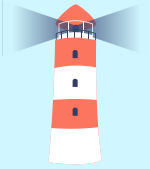


Envisioning Ecosystem



Larger canvases are available to support you in envisioning a healthier ecosystem and exploring actors and roles.

- What would a healthier ecosystem look like? What desired futures do you imagine?
- What would be the purpose at the core of the ecosystem? And what values would lie beneath?
- What would need to change to support this vision?



Envisioning Roles

Envisioning “Actors & Roles” (FUTURES)

Which roles are vital for a healthier ecosystem?
What new actors or roles might emerge?
Which roles might become less important or less supportive?

What role(s) could you play?

What interactions would be key?
What kind of relationships would need to be nurtured?
What forms of collaboration might support the ecosystem’s health?
How can you contribute?

Biodiversity of actors & roles

Use the water column to think creatively about the future ecosystem and you

Unexpected Interactions

The incredible adaptability and complexity of marine ecosystems show how species evolve and interact in unique ways to survive and thrive in their environments. Here are some examples to trigger your imagination about:

- Mutualistic Relationships
- Symbiotic Housing
- Bioluminescence
- Unique Reproductive Strategies
- Complex Social Structures, Alliances
- Unusual Feeding Behaviors
- Ecosystem Engineers
- Resilience to Extreme Conditions

Curious about more biological strategies?
You can go deeper at asknature.org

Light in the dark

Nutrients recycling

Shelter

Hosting infrastructures

Habitat restoration

Species health

Producers of nutrients and energy

Consumers

Oxygen balance

Use the bigger canvas to reflect on actors & roles and gain inspiration from the “Unexpected Interactions Cards”.

Which roles are vital for a healthier ecosystem?

- What new actors or roles might emerge?
- Which roles might become less important or less supportive?
- What role(s) could you play?

What interactions would be key?

- What kind of relationships would need to be nurtured?
- What forms of collaboration might support the ecosystem’s health? How can you contribute?

“A Day in the Life of an Ecosystem: Learn to See with The Sea” is a tool developed by F.Makki & N.Martin for “Culture in the Civic Space in the MENA region: Learning Journey for Field Supporters”. iac Berlin



Exploring Future Role(s): Organization

As you get ready to return to your team, what initial ideas and open questions would you like to bring back and test with them?

Developing Role Hypotheses*

- What potential role(s) could your organization play?
- How might these roles contribute to a healthier ecosystem?



*Try to turn your ideas into hypotheses (if then)

Distinguish between your spheres of interest & influence.

Select up to 3 “Unexpected Interaction Cards” that resonate with these potential role(s).

Learning Questions & Experimentation

- From your ecosystem observations and role hypotheses: what learning questions could guide you over the next two years?
- How can experimentation help you explore these learning questions?

Setting Intentions

- Of all your hypotheses, what would you like to focus on and test in the next year?

Learning Journey & Experimentation

The following cards are intended to capture current understanding, learning questions, and ideas for future experimentation plans you might consider. Understanding the ecosystems we are a part of is a nonlinear and cyclical process. The more we listen, the more we learn, the more our ideas and questions evolve.

We invite you to take time as a team in a workshop setting to revisit your ecosystem understanding with fresh (marine) eyes. Use the process to integrate insights, feedback, and fresh perspectives from the rest of the team.

5 steps will guide the flow of your conversations:

- **Step 1: The current state (Now)**
- **Step 2: Visions for a Healthier Ecosystem**
- **Step 3: Exploring Future Role(s)**
- **Step 4: Learning Questions & Experimentation**
- **Step 5: Intentions & Experimental Plans**

At each step, you will find reflection questions and some facilitation tips to guide your conversations.

Once you have reflected on each step, take a moment to capture your insights.

Facilitation Tips

Setting the frame

Try to give yourselves enough time to reflect and exchange around the journal as a team. We recommend taking a day, either in one go or split into sessions over several days.

Use the journal to take first notes, alone or with your team, and use the following cards to dive in, invite feedback, and perspectives. This loop will help to deepen your collective understanding of the ecosystem. You can find more facilitation tips about how and where the material may be useful in the card “Sharing Stories”.

Deepening your collective understanding does not necessarily mean convergence; surfacing diverse perspectives is also very valuable.

Check your observations and hypotheses with other actors in your ecosystem.

Facilitation Tips

Sharing stories, sparking conversation & feedback loops within your team

Step 1: Current State (Now)	Use the “A Day in the Life of an Ecosystem” Journal and the Sensemaking Canva to share an overview of your current understanding, along with the patterns and themes emerging.
Step 2: Vision for a Healthier Ecosystem (Desired Futures)	Share the "Envisioning" canvas on Ecosystem and Roles, and “Unexpected Interaction Cards” to spark imagination and creative thinking about the future state of the ecosystem and role-playing opportunities.
Step 3: Exploring Future Role(s)	Present the “hypotheses” that emerged. Invite your team to select up to 3 “Unexpected Interaction Cards” that resonate and discuss how these examples reflect your organization's potential role(s) in a healthier ecosystem. Use the questions around your spheres of interest and influence to converge on potential areas of role-playing.
Step 4: Learning Questions & Experimentation	Recall your role-playing intentions. Invite each team member to share up to 3 learning questions. Together, cluster them according to the level (individual, organization, and ecosystem) and theme. Consider voting to identify learning hotspots.
Step 5: Intentions & Experimental Plans	Build on your learnings to inform new experimentation plans and break them down into actions to test within a year and beyond.

Step 1

The current state (Now)



- **The Current State of the Ecosystem**
 - How would you describe the current state of the ecosystem you are a part of?
 - What is the current purpose of the ecosystem?
 - What actors, roles, and resources are present? How do they interact?
 - Where do you sense the urgency or potential for change?
- **Your Current Role(s)**
 - How do you understand your current role(s) and position within the ecosystem?
 - Reflecting on your current role: To what extent does it feel like a good fit? Where is there room to grow or shift?

Step 2

Visions for a Healthier Ecosystem (Futures)



1. What might a healthier ecosystem look like?

- What desired futures do you imagine?
- What would be the purpose at the core of the ecosystem?
And what values would lie beneath?
- What would need to change to support this vision?

2. Which roles are vital for a healthier ecosystem?

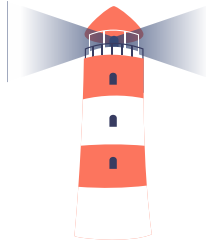
- What new actors or roles might emerge?
- Which roles might become less important or less supportive?

3. What interactions would be key?

- What kind of relationships would need to be nurtured?
- What forms of collaboration might support the ecosystem's health?

Step 3

Exploring Future Role(s)



Developing Role Hypotheses

- What potential role(s) could your organization play?
- How might these roles contribute to a healthier ecosystem?
- Try to turn your ideas into hypotheses (if then)

In your reflections, consider what is within your sphere of interest and influence:

- **Sphere of Interest:** What are you passionate about working towards, even if it is beyond your sphere of influence? What areas of the ecosystem are you most interested in?
- **Sphere of Influence:** Where does your organization have real influence and agency? What resources or networks can you leverage to contribute to the ecosystem's health?

Step 4

Learning Questions & Experimentation



Learning Questions

- From your ecosystem observations and role hypotheses, what learning questions can guide you over the next 2 years? (Try to narrow these down to 3 key questions.)
- How can experimentation help you explore these learning questions?

How will you integrate learning into your experimentation?

- Individual Level: How can individuals develop the skills and knowledge needed to navigate their role and support the ecosystem?
- Organizational Level: What does your organization need to learn or unlearn as you step into these role(s)? What learning practices would support you? Who will care for the learning processes internally within your organization? What resources, skills, or partnerships are key?
- Ecosystem Level: How can this learning journey support both your organization and the overall well-being of the ecosystem? How can you learn with and from others? Who else from the ecosystem can you invite to your learning exchanges?

Step 5

Intentions & Experimental Plans



Setting Intentions

Of all your hypotheses, what would you like to focus on in the next year?

Designing your experimentation plan

Over the next year, what experiment(s) do you plan to conduct to test your role hypotheses?

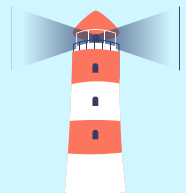
Describe your initial action plan, timeline, and ideas for how you would like to approach your experimentation & learning.

Unexpected Interactions

The incredible adaptability and complexity of marine ecosystems show how species evolve and interact in unique ways to survive and thrive in their environments. Here are some examples to trigger your imagination about:

Mutualistic Relationships
Symbiotic Housing
Bioluminescence
Unique Reproductive Strategies
Complex Social Structures: Alliances
Unusual Feeding Behaviors
Ecosystem Engineers
Resilience to Extreme Conditions

*Curious about more biological strategies?
You can go deeper at asknature.org*



Mutualistic Relationships

Cleaning Stations



Certain fish species, like cleaner wrasses, set up "cleaning stations" where larger fish (clients) come to have parasites and dead skin removed. This mutualistic relationship benefits both the cleaners, who get a meal, and the clients, who get cleaned.

Reference: <http://www.seb-lab.org/research/cooperation-cleaner-wrasse/>

Unexpected Interactions

Symbiotic Housing Mutualism



Some hermit crabs carry sea anemones on their shells, gaining protection from the anemones' stinging cells while offering mobility and food scraps in return. As hermit crabs grow, their shells become too tight, forcing them to quickly find larger ones or risk being left exposed and vulnerable. When they move to a new shell, they bring the anemones along. Hermit crabs engage in a social behavior called “synchronous vacancy chains,” where they exchange shells. This system efficiently distributes limited, reusable resources within the community, creating a multiplier effect: the introduction of one new shell benefits not just a single crab, but many others in the community.

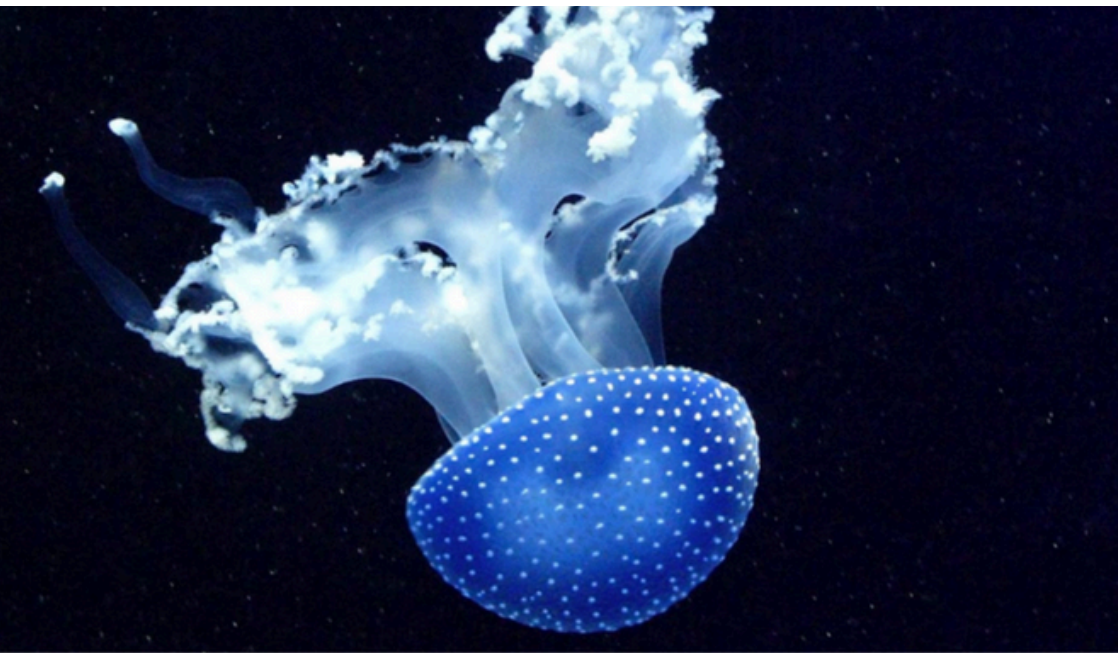
References:

Amazing video: <https://www.youtube.com/> (type image title)
<https://link.springer.com/article/10.1007/s13199-024-00991-7>
<https://asknature.org/strategy/social-networking-aids-housing-search/>

Unexpected Interactions

Bioluminescence

Light-emitting Organisms



Defense Mechanisms: Many marine organisms, like certain species of jellyfish, squid, and fish, use bioluminescence to confuse predators or attract prey. The light can startle predators or create a "burglar alarm" effect, attracting even larger predators that might eat the attacker.

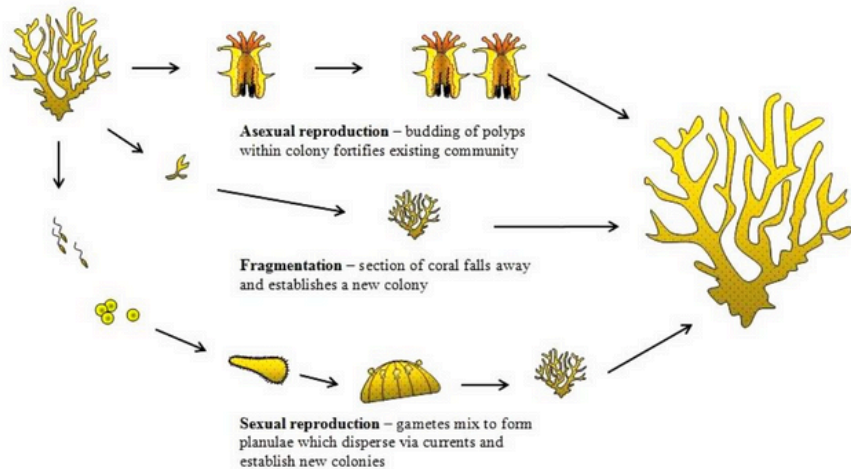
Deep-Sea Communication: In the deep sea, where sunlight doesn't penetrate, some species use bioluminescence for communication, mating, and camouflage.

Reference: <https://www.nhm.ac.uk/discover/what-is-bioluminescence.html>

Unexpected Interactions

Unique Reproductive Strategies

Coral spawning



Many coral species release their eggs and sperm into the water simultaneously in a synchronized spawning event. This often occurs after a full moon and ensures that a higher number of gametes meet for fertilization.

Reference: <https://engineeringfordiscovery.org/how-do-corals-reproduce/>

Unexpected Interactions

Complex Social Structures

Dolphin Alliances



Bottlenose dolphins form complex social structures and alliances. Males often form coalitions to cooperatively court females or defend against rivals, and these alliances can last for years. Bottlenose dolphins develop lifelong friendships early on that will benefit them through shared information, cooperation, and other means. In both males and females, dolphins choose their friends carefully, spending more time with these individuals and strengthening these bonds throughout their lives.

References:

<https://asknature.org/strategy/juvenile-dolphins-choose-friends-to-help-through-life/>

<https://www.theguardian.com/environment/2022/aug/29/male-dolphins-form-lifelong-bonds-that-help-them-find-mates-research-finds>

Unexpected Interactions

Unusual Feeding Behaviors

Bubble-Net Feeding of Whales



Cooperative Hunting: Humpback whales use a technique called bubble-net feeding, where they create a circle of bubbles to trap and concentrate schools of fish. They then swim upward through the "net" with their mouths open to capture large quantities of prey.

Reference: <https://marinesanctuary.org/blog/bubble-net-feeding-what-is-it/>

Unexpected Interactions

Ecosystem Engineers

Sea Otters and Kelp Forests



Sea otters are important for keeping kelp forests healthy. They eat sea urchins, which would otherwise eat too much kelp. This helps protect the kelp forest and the many species that live there. Kelp is a big, brown plant that grows underwater and gives food and shelter to many sea species.

Reference: <https://sanctuaries.noaa.gov/visit/ecosystems/kelpdesc.html>

Unexpected Interactions

Ecosystem Engineers

Mudskippers and Mangroves



A few dozen species of mudskippers live in mangrove and tidal-zone ecosystems around the world, including on Kuwait's coast, where it took veteran National Geographic photographer Thomas P. Peschak "many hours of lying motionless in the mud to photograph the courtship rituals" of the fish.

Mudskippers are amphibious fish that live in mangrove ecosystems and contribute to the health of their habitats by burrowing and creating small pools that can help young mangrove plants grow.

Incredible video:

<https://www.nationalgeographic.com/magazine/article/mudskipper-builds-ideal-nest-for-his-offspring>

Unexpected Interactions

Resilience to Extreme Conditions

Hydrothermal Vent Communities



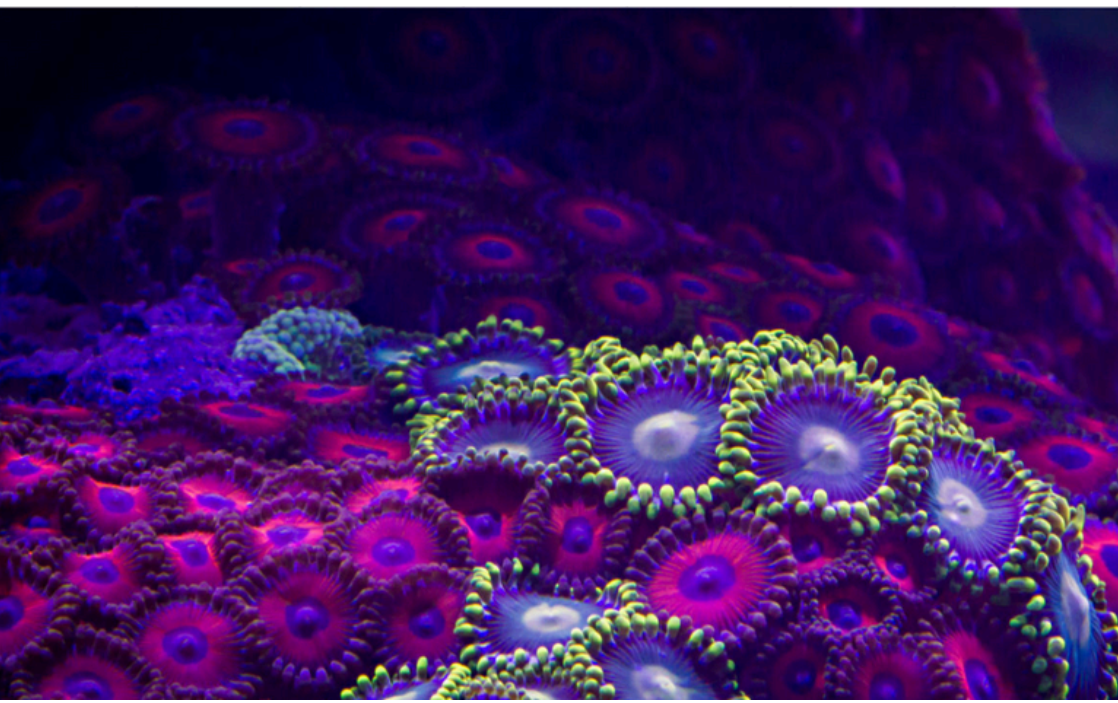
Extreme Adaptations: Organisms living around hydrothermal vents, like tube worms and giant clams, thrive in extreme conditions with high pressure, temperature, and toxicity. These species rely on chemosynthesis, where bacteria convert chemicals from the vents into energy, rather than photosynthesis.

Great video: <https://education.nationalgeographic.org/resource/deep-sea-hydrothermal-vents/>

Unexpected Interactions

Resilience to Extreme Conditions

Coral Acclimatization



Heat-Resistant Corals: Some coral species are showing signs of adapting to warmer temperatures. Researchers are studying these corals to understand their mechanisms of resilience to potentially support the recovery of more vulnerable coral species.

Reference: <https://www.barrierreef.org/news/explainers/understanding-heat-tolerance-in-corals-great-barrier-reef>

Unexpected Interactions

Bio

Farah Makki

Farah joined iac Berlin in 2024 to design and facilitate formats for the Culture in the Civic Space learning journey in the MENA region. She brings her “Mediation Culture” approach, connecting science, society, and policy to foster meaningful, locally informed change.

With over a decade of experience in participatory urban planning, policy-oriented research, and public engagement, Farah has collaborated with foundations, NGOs, and universities across the Euro-Med region, including the Polytechnic of Milan, where she has been leading action-research projects since 2021. Her work focuses on culture-led transitions, transformative learning, cross-sector partnerships, and facilitating impactful funding frameworks.

Naomi Martin

Naomi Martin has been working as a Learning Facilitator at iac Berlin since June 2023. In this role, she also designs and facilitates formats for the Culture in the Civic Space learning journey in the MENA region.

With a diverse background in facilitation and program management, her previous roles include serving as a Facilitator for an independent initiative and as Programme Manager for Actors of Urban Change at MitOst e.V. She has also contributed to organizations such as the Sharing Perspectives Foundation, SINGA Deutschland, and NGO EduAction, where her work focused on community management, global program coordination, and workshop facilitation.

Creators

Developed by

A Day in the Life of an Ecosystem: Learn to See with The Sea" is a tool developed by Farah Makki & Naomi Martin in the framework of the program "Culture in the Civic Space in the MENA region: Learning Journey for Field Supporters", implemented by the International Alumni Center gGmbH (iac Berlin) and supported by the Ford Foundation. Drawing on Ecosystem Cards for inspiration, the tool was designed and tested in the program's kick-off event in October 2024 and published in 2025.

Learn more:

<https://field-supporters.net>

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ISBN 978-3-9827637-1-2