OCEAN FUTURE LAB

HOW DO WE WANT TO LIVE WITH THE OCEANS?

Foto: Anke Neumeister/Deutsches Meeresmuseum

Participatory Science Communication Project Kicked off in the German Science Year 2022 - Participate!

An Initiative of the Federal Ministry of Education and Research

Science Year 2022 Participate!


Foto: Anke Neumeister

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Imprint

We thank all teams of the partner organizations
for their endless efforts and amazing collaboration.

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BACKGROUND

THE PROJECT IDEA

The sustainable use of the coasts, seas and oceans is a big challenge that affects us all. Only together can people across sectors work out convincing answers to significant questions, exchanging their solution ideas for desirable futures. The Ocean Future Lab (OFL) is a transdisciplinary place to aggregate knowledge and develop creative impulses and positive visions. These guiding questions are central:

"How do we want to co-exist with the oceans? How can we live sustainably with the coasts, seas and oceans to save our source of life and secure desirable futures on our "blue planet"?"

The project offers multi-stakeholders and citizens the opportunity to include their perspectives and to formulate their ideas and impulses. The close cooperation between citizens, artists, innovators, scientists as well as cultural and scientific institutions fosters imagination and design possibilities while identifying potential for action. Future visions and clear images of future scenarios arise from the questions and ideas that interested citizens put together based on facts from scientific research. Artists then take over the visual design of these future probes to open a dialogue with a broader audience.

In 2022, the Ocean Future Lab was carried out through an open call to creatives, a hackathons and science slam as well as a series of co-creation workshops in online and face-to-face formats. Partners of this joint collaboration are the German Alliance for Marine Research, the Institute for Art and Innovation Berlin (IFAI), the German Oceanographic Museum in Stralsund (DMM), the German Maritime Museum in Bremerhaven (DSM), the Futurium Museum in Berlin, the Berlin International University as well as the FIlm University Babelsberg.

The project was supported by the German Ministry for Research and Education as part of the Science Year Project - Participate!

OUR GOALS

The aim is to create a knowledge-based awareness of the importance of healthy oceans and marine ecosystems for the provision of people's livelihoods and to establish a connection to one's own responsibility, design solutions and sustainable action - understanding that the interrelationships are complex, global and mostly cannot be solved at the level of individuals. Through co-creative Ocean Future Labs, citizens learn how to develop and contribute their own visions and options for the future. This is intended to strengthen civic engagement as well as participation in shaping the future in a fruitful exchange between science and society.

OUR APPROACH

WHY ART?

The Ocean Future Lab format is designed as a place for the co-creative, interdisciplinary design of future scenarios for oceans and people; as a platform for civil participation, to address social transformations in the exchange between science and society and to evoke them through art. In the Ocean Future Lab, art is used as a trigger. Art makes thought and vision processes visible and physically tangible. Art can inspire, give food for thought, act as a catalyst for ideas and innovations and lead to new perspectives and solutions. The Ocean Future Lab thus follows the concepts of "Ocean Literacy" and "Futures Literacy" of UNESCO and aims at the ability of people to imagine different futures and at the same time to consider their responsible design.

FUTURE PROTOTYPING

First, the topics to be prioritized in the workshops were specified. Out of the planned 3 topic complexes (coasts, high and deep sea as well as oceans as common property), the partners agreed on 5 topic complexes, which the scientists considered to be better suited for communicating the challenges for the seas. In the online workshops, the participants could therefore choose from the following topics: use, responsibility, place of power, sea citizens, handling.

THE FIELDS OF ACTION

The specific topics for the Ocean Future Lab are based on the questions and ideas from citizens that are collected by the partnering organizations in the initial phase of the project. The call is open to all interested parties to apply with creative questions and ideas on marine topics, using different media, i.e. pictures or video clips. By public voting as well as by a jury the best submissions are selected for an online exhibition. The questions in turn flow into the project. The focus is on three main topics, which are designed and processed according to the questions and ideas submitted:

Coasts and coastal seas are habitats that are used in a variety of ways and experienced directly by people. Under this topic, conservation concepts, conflicts of use and discourses about the concreate sustainable actions meet individual claims and values. Offshore wind farms, fisheries and aquaculture, natural spaces for recreation, protected areas for endangered animal and plant species compete for the limited space in the ocean.

High seas and deep seas are living environments, and for most unreachable distant but fascinating, shaping living conditions on earth. Here, too, it shows that human actions and economies make clear. Here, too, it is evident that human actions and economies have a clear influence on the oceans - particularly striking in the almost ubiquitous plastic waste and the massive noise pollution in the sea.

The oceans are considered as global commons and of paramount importance for securing the livelihoods of mankind. Can such concepts lead to effective protection and sustainable use? In international maritime law, the deep sea floor and its resources are defined as "the common heritage of mankind". The UNESCO World Heritage sites, such as the Wadden Sea of the North Sea, give a status to a natural environment that should be preserved for future generations.

TARGET GROUPS & STAKEHOLDERS

The participatory project involves actors from society, science and art in the Ocean Future Labs. The collaboration is intensive and aimed at using individual critical thinking and creativity for the common goal. In addition, the participants act as multipliers. The results of their joint work are disseminated via the digital and direct communication channels of the project partners.

During the mobilization phase, **citizens** were asked specifically about their topics and wishes regarding the focus of the Ocean Future Lab. They were motivated via an open call to get creatively involved with their own pictures or video clips.

Young scientists were invited via the member institutions of the German Alliance for Marine Research (DAM), such as the marine science youth organization ICYMARE.

Artists secure the basis for the cultural mediation success of the project. They got onboarded via the open call and the network of the Institute for Art and Innovation (IFAI) with over 5.000 creative people as well as via the Film University Babelsberg.

Innovators from the sustainability sector were also involved via the IFAI and the DAM networks as well as via the social media channels..

TIMELINE

First Phase - Mobilization Phase: February 2022 to April 2022

Citizens were involved in cooperation with the German Science Year's communication campaign. The German Alliance for Marine Research and its 23 member institutions together with the institution "Wissenschaft im Dialog" (Science in Dialogue) participated in the "Ideas Run" as well as in the format "Science Controversial".

Furthermore, an Open Call was organized, inviting all interested parties to contribute creative submissions (images, video clips) as well as impulses and ideas on marine topics, which were selected by a jury for an accompanying online exhibition. The questions and ideas collected were incorporated into the thematic design of the planned online and face-to-face workshops.

Second Phase - Interaction Phase: May 2022 to December 2022

Ocean Future Labs events:

In summer 2022, the Ocean Future Lab was held as online workshops and as face-to-face events at museums (DMM, DSM, Futurium) and at the Berlin International University.

In September 2022, a 72hrs Hackathon took place, in which the ideas of selected teams were improved and accelerated with the support of mentors.

In December 2022, the results were published as an impulse for the political arena and to the general public.

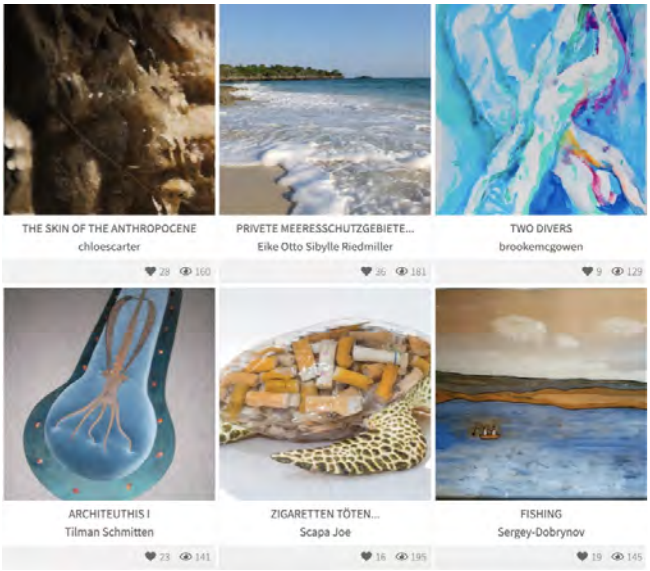
ORGANIZED EVENTS

15.02.2022 - 30.04.2022	**Open Call** on www.universal-sea.org (Ger/Eng) How do we want to live with the oceans?
01.05.2022 - 08.05.2022	**Online Gallery -** Submissions published on www.universal-sea.org - New Website on www.oceanfuturelab.de (Ger)
02.05.2022 – 08.05.2022	**Public Voting -** The Public Voting invited all interested people to vote for their favorites. The two most voted ones got a wild card to enter the Hackathon directly. **Jury Selection -** The Open Call Jury selected the 5 most promising ideas to participate in the Hackathon.
24.05.2022	**Online Workshop** Transdisciplinary co-creation of future scenarios
31.05.2022	**Workshop at OZEANEUM, German Oceanographic Museum, Stralsund (DMM) -** Transdisciplinary co-creation of future scenarios with focus on the Living Museum in 2050
09.06.2022	**Online Workshop** Transdisciplinary co-creation of future scenarios
25.06.2022	**Workshop at the German Maritime Museum, Bremerhaven (DSM) -** Transdisciplinary co-creation of future scenarios with focus on the innovative city at the sea
07.07.2022	**Online Workshop** Transdisciplinary co-creation of future scenarios
26.08.2022	**Workshop at FUTURIUM museum, Berlin** Testing of Future Box "Oceans"
21.09.2022 – 23.09.2022	**Online Hackathon and Science Slam** The Hackathon offered the 7 finalists the opportunity to further develop their project ideas with participants as well as mentors and experts. The Science Slam presented short scientific talks on relevant topics.
23.09.2022	**Final Jury Session -** At the end of the Hackathon event, an expert jury selected the 3 final winners (Ocean Future Ambassadors) of the Ocean Future Lab.
15.10.2022	**Workshop at BERLIN INTERNATIONAL UNIVERSITY** Transdisciplinary co-creation of future scenarios
22.10.2022	**Official Award Ceremony at the Entrepreneurship Summit** The 3 winners received their awards and presented their solutions publicly at the Entrepreneurship Summit in Berlin.
03.11.2022	**Online Workshop** Transdisciplinary co-creation of future scenarios
10.11.2022	**Presentation of the Participation Campaign** "Future by the Sea", Bremerhaven
23.11.2022	**Science Year 2022 Closing Event** **Federal Ministry of Education and Research, Berlin** Project presentation by all partners involved
24.11.2022 15.12.2022 12.01.2023	**Open Lab Evenings, Workshops with Future Box "Oceans", FUTURIUM Museum, Berlin**

PARTICIPATORY FORMATS

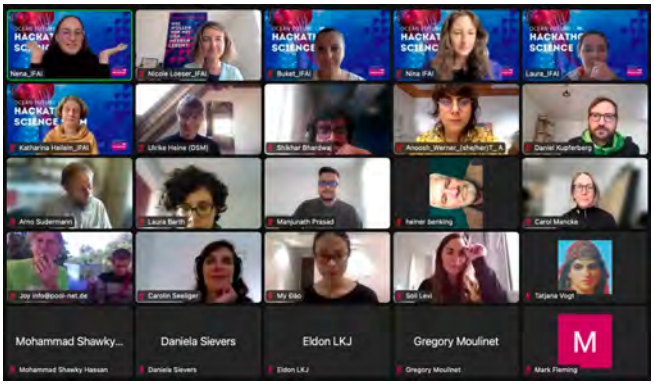
The project invites citizens, especially young people (as the next generation), to develop future scenarios and visions together in a transdisciplinary network of artists, innovators, and (young) scientists in a knowledge-based and co-creative way. These different groups are seen as target groups and stakeholders at the same time, able to share their knowledge with each other, develop their own ideas and formulate concepts in the Ocean Future Lab. In total, **20 narratives** emerged from the 8 workshops (4 online workshops and 4 face-to-face workshops) based on the future prototyping method. The collaboration was found to be extremely productive and inspiring. The ideas, i.e. future scenarios and options for action, from the online workshops were coded and evaluated and compiled into a concrete impulse paper. Professional artists commissioned by IFAI then transformed the ideas into visuals in various media opening a way how these visions for the future - for living with the oceans - can reach the collective consciousness. An exchange with the partner organizations (including departments such as museum curation, museum education, public relations), the artists, and workshop participants is planned for 2023 to explore possibilities, including for exhibitions and a broader dialogue, based on the visualizations.

OPEN CALL



The call received 20 submissions from about 40 participants living and working in Germany. These were of high quality and submitted by scientists, artists and activists. The public voting to identify the 2 wildcard winners had 3222 hits. An Open Call Jury, consisting of representatives of the partner organizations, selected another 5 teams to the Hackathon (to accelerate their ideas).

ONLINE-WORKSHOPS



Due to the interference of the Russia-Ukraine conflict, a total of 208 participants took part in the 3 online workshops and the hackathon, which was lower than expected.

The composition of the online workshop groups was heterogeneous and consisted on average of: 35% artists, 45% scientists, 20% citizens.

The participants learned about the workshop in the following ways: 45% by personal Invitation and recommendation, 30% press and 25% social media.

The four online workshops and the workshop at Berlin International University were conducted by experienced facilitators from the Institute for Art and Innovation (IFAI). They are interdisciplinary and brought together interested citizens with scientists, artists and innovators. The process: First of all, the respective topic is introduced in a descriptive way. Innovative approaches to the protection and sustainable use of the oceans are presented as examples. By means of a clearly structured, action-oriented, co-creative process based on the methods of future prototyping, world building, concept art and scenography, ideas, future scenarios and proposed solutions are developed. On the one hand, measures are derived by regnosis. On the other hand, future scenarios are designed and visualized with artistic means. In this way, mechanisms of action and consequences can be played out in an exemplary manner. The utopian becomes visually concrete and imaginable..

HACKATHON

During the online hackathon, interested citizens worked together with young scientists, creative minds and innovators. The main focus was to synthesize the results of the workshops into usable solutions. This format is intended to contribute to further civic engagement in the context of the International Decade of Marine Research for Sustainable Development 2021 to 2030.

SCIENCE SLAM

Besides 10 mentors supporting the teams in their acceleration, the OFL invited cross-sectoral 5 experts to share their insights, scientific facts and inspiration on sustainability, the ocean, climate change and water pollution with the online audiences.

FACE-TO-FACE EVENTS

Three **face-to-face workshops** were held in each of the participating museums. The basic concept was similar to that of the online workshops: interested citizens work co-creatively with participants from science, innovation and art on a respective topic.

Dr. Ulrike Heine, DSM

At the face-to-face workshops, 160 participants met for the future-prototyping. On average, 20% artists, 40% scientists and 40% citizens took part. The participants learned about the workshop in the following way: by 80% personal Invitation and recommendation, 10% press and 10% social media.

At the Ocean Future Lab workshop in Bremerhaven, the participants expressed the wish to continue the discussion on the future of Bremerhaven as a coastal and port city on a larger scale and more visibly. Representatives of various stakeholder groups came to the kick-off event on November 10, 2022.

The banner and the map application were presented to the Bremerhaven public. Numerous institutions and social groups have signaled interest in **mapping different future topics in subprojects.** A further and age-diverse audience was addressed via an extensive social media campaign.

Dr. Ute Wilhelmsen (DAM), Futurium

The **Open Lab evenings** organized in cooperation with the Futurium, using the Future Box "Oceans" developed at the OFL as workshop material, proved to be extremely successful with regard to the target group of young people and citizens. The feedback so far shows a great interest in the use of the Future Box in the school context and the implemented workshops in the Futurium also met with great interest. The series will be continued in the coming year. The first workshop at Futurium in Berlin took place on August 25, 2022 with a total of 17 participants. Moderated by Dr. Christian Engelbrecht, education officer at Futurium, a prototype of the Future Box “Oceans” was used, which was then discussed in detail and optimized based on the feedback. This was followed by two more test runs, each with smaller groups. In this way, the Future Box "Oceans" could be finalized in a participatory and demand-oriented manner.

The Open Lab evenings were started in November 2022 and will be continued in 2023. In this series of workshops with the Future Box "Oceans", participants exchange ideas under the motto: "Living with the oceans, but how?". They then develop creative impulses and future perspectives together. At the end, the participants have the opportunity to submit their "demand on ocean policy" as a short statement. The German Alliance for Marine Research (DAM) collects these impulses from the various workshops and brings them into the dialogue with politics, society and industry. All dates and evaluations will be communicated via the OFL website, among others: www.oceanfuturelab.de/zukunftsbox-meere (Ger).

FACTS, FIGURES AND DATA (OUTPUTS)

Number of Partners

4 **Consortium Partners**
DAM, DMM, DSM and IFAI

3 **Collaborative Partners**
Futurium Berlin, Filmuniversität Babelsberg, Berlin International University

Number of OFL Events

7 **Online Events**
Open Call incl. Public Voting, Hackathon, Science Slam, 4 Online Workshops

9 **Face-to-Face Events**
4 face-to-face workshops and 3 Open Lab evenings in 2022, plus presentation/talk/award ceremony at the Entrepreneurship Summit Berlin and kick-off event for the participation campaign "Future by the Sea", Bremerhaven

26 **Online Partner Meetings**
to coordinate activities with regard to successful project implementation

Number of Participants and Visitors

Total number of workshop participants **400**

Total number of visitors **6.963**

Total reach of social media and websites **424.700**

www.universal-sea.org - Open Call, Online Gallery, Hackathon
www.oceanfuturelab.de - Platform

MEDIA COVERAGE AND CAMPAIGNING

26 press articles (15.2.22 - 31.12.22) covered the Ocean Future Lab so far. Please see list on: universal-sea.org

As planned, the citizens were already specifically asked about their topics and wishes during the mobilization phase. This was prompted by **postcard campaigns** as well as the **question run** of the German Science Year 2022 by the Federal Ministry of Education and Research at the participating museums DSM and DMM.

Through the partner networks, mailing lists and public announcements, also through numerous internet portals as well as the social media channels of the partners, civil society was invited to participate in the Open Call and to contribute creatively with their own ideas (based on a picture or video clip including a short text). Public voting helped to increase participation and identify the 2 wildcard winner teams.

The accompanying press work for the Ocean Future Lab was carried out jointly by the four project partners. Joint press releases were issued, i.e. at the start of the project as well as before the hackathon and sent out via the press distribution lists of the collaborative partners. In addition, various events were accompanied by the press. The target groups were addressed and the events were advertised via personal mailing lists, newsletters, social media channels, and other communication measures of the respective implementing institutions. The continuous address regarding workshop invitations as well as the hackathon/ science slam was carried out via the communication channels of the participating institutions with their respective networks as well as via partially sponsored advertising via social media and classic media (press announcements for the events). IFAI realized the OFL rollup, which was used for the first time at the workshop in Bremerhaven.

The Ocean Future Lab was introduced several times at events, where participants were invited to the OFL workshops. IFAI presented it at the SXSW Festival in Austin/USA, the Institute for Advanced Sustainability Studies, the Carbonale Festival, the Circular Futures Festival, and the Filmmuseum Potsdam, among others. DAM presented the Ocean Future Lab at the Forum Science Communication in Hannover with a lecture. Together with Wissenschaft im Dialog (WiD) and the DSM, the event of "Science Controversial" was initiated, which took place in the Ozeaneum in Stralsund to accompany the face-to-face-workshop. According to Michael Siegel of WiD, who is responsible for the initiative, the event of this dialogue series showed the highest number of visitors to date.

Based on the existing infrastructure of the DAM, **the website of the Ocean Future Lab** www.oceanfuturelab.de was conceived, designed, technically and content-wise implemented and editorially supervised during the course of the project. This platform is used to announce workshops and events, share project information, present project results and network participants. The website primarily serves as a hub for information, and the generally accessible presentation of project results and products is also realized on the OFL website.

QUALITATIVE EVALUATION (OUTCOMES)

How do we want to live with the oceans? During the **16 events organized by the OFL**, citizens were able to focus on this question together with experts from the arts, science and innovation to raise awareness of current challenges and develop their vision of positive futures for coasts, seas and oceans.

Civic engagement in dialogue with marine science is a focus of the International Decade of Marine Research for Sustainable Development 2021 to 2030, and the Ocean Future Lab is open to all interested parties. Together, ideas for tomorrow's world are discussed and negotiated, and possible scenarios for the year 2050 are developed.

The co-created future scenarios formed the foundation for **20 narratives**, serving as templates for **6 artistic visualizations**. These express values and desires that the participants associate with the ocean. Conclusively, the Ocean Future Lab aims to discuss an impulse paper for further participatory formats on the topic of sustainability in dealing with coasts, seas and oceans.

EVALUATION / PARTICIPANT FEEDBACK

In order to investigate the awareness as well as the action capacity of the participants in workshops for sustainable management of coasts, seas and oceans, surveys were conducted via Typeform, which IFAI used as a research tool. Looking at and co-creating narratives together, negotiating positive future scenarios, and sharing knowledge and focusing on action in the present were found to be constructive and inspiring by participants.

EVALUATION ONLINE WORKSHOPS – NARRATIVES' ANALYSIS

Each online workshop started with an introduction by the facilitators (IFAI), who provided background information on the partner organizations, the German Science Year, the marine topics and the workshop method. Afterwards, small groups of max. 5 participants were formed, whereby a heterogeneous composition was ensured in order to guarantee a transdisciplinary exchange. In a workspace designed by IFAI (MIRO), the participants could first get to know each other.

Afterwards, they informed themselves in an archive of existing innovations in the maritime sector (researched by IFAI) as well as about the 5 topics, which were prepared by the scientists (DAM). In a 4-hour workshop process based on elements of Futures Literacy, Design Thinking, World Building and Regnosis, the participants developed narratives for desirable futures for living with the oceans.

Selection of Topics

Usage 7 x

Handling 6 x

Responsibility 4 x

Sea Citizen 2 x

Place of Regeneration 1 x

Envisioned Objectives for the Future Scenarios

- Humankind takes responsibility for the protection of the oceans, e.g. tax/ voluntary levy for marine protection
- Everyone should contribute to livable futures on our blue planet through sustainable behavior
- Development of circular societies and regenerative cultures
- Enabling responsible action towards the next generations
- Establishing floating communities on mobile modules so that people can learn to live in different communities and work structures.
- Inter- and transdisciplinary Ocean Tech Campus based on open source research.
- Maritime farms, so called "Green Oceans" - agricultural cooperative between marine animals/sea plants and humans.
- Building symbiotic interspecies families that are collaborative, self-organized and agile.
- Self-sufficiency in coexistence with all species as the new norm
- Restoring biodiversity
- Developing collaborative multi stakeholder platforms as a model for cities and communities to accelerate knowledge transfer and transdisciplinary knowledge generation, including water pollution control, CO2 emissions reduction through seagrass beds, algae research for food and electricity production.

Envisioned Solutions

a) Art-science projects to present knowledge that is difficult to communicate as well as make emotional connections for other species.

b) Energy production from the oceans (tidal energy, energy from algae).

c) Maritime agriculture (incl. aquaculture, seagrass fields, algae cultivation)-multiple choice.

d) Mobile inter- and transdisciplinary research stations to develop problems directly in the field.

e) Implementation of a resource-based regenerative economy (Circular and Regenerative Economy).

f) Software-based knowledge platforms for value-based, life-long and life-oriented learning.

g) Open Labs as platforms for transparent data analysis and collection to identify solution ideas and create innovations (e.g. algae fields for decarbonization)

h) Algae as a plastic substitute - use in medicine, building materials, and superfoods. Alkaline algae culture counteracts ocean acidification.

i) Meetups for people in the city and digital crowdfunding for ocean conservation projects.

j) Bubblefish technology for communication with animals, e.g. between humans and whales.

k) Community building for knowledge creation and faster familiarization on floating work and living units.

l) Research projects for revival of dying species, coral restoration and all techniques for reforestation of the marine plant and animal kingdom.

m) Sensor development and Citizen Science for floating modules to adapt to standing and flowing waters.

n) Ongoing transdisciplinary knowledge transfer on research status and exchange on methods and practices.

o) Distribution of algae-based food products

p) Local use of algal current

Advised Implementation Measures

ECONOMIC

• Increased transformation towards Circular Economy (CE) approaches, e.g. aquaponics.

• Transfer of CE knowledge to maritime economy.

• Use of sustainable building materials for ships, research stations, etc.

• Better funding structure landscape of open science projects.

• End subsidies for fossil fuel companies.

SCIENTIFIC/ CULTURAL

• Establish transdisciplinary research projects for e.g. floating modules or algae research to establish collaborations between architects, engineers, marine scientists, artists and designers (e.g. artist-in-residency programs).

• Knowledge transfer regarding approaches to co-existence with non-human species.

• Establish training programs for interested people for more Citizen Science.

• Establish an interdisciplinary water museum, so that all knowledge and innovations around the topic can be communicated

• Knowledge transfer and processing of indigenous knowledge from ethnic groups already living on floating modules.

• Foundation of a Eurovision Song Contest based on the imitation of whale songs

INNOVATIVE

• Support for the development of digital platforms that enable citizens to point out polluting companies - a Wikileaks for polluter companies.

• Installation of hydro, wind and solar energy production facilities on the water.

• Research and development initiative on floating habitat/ formation of "living corridors" in transdisciplinary projects.

LEGAL

• Restriction of fossil raw material extraction from the oceans

• Legal approval of Tiny Houses or floating dwelling units and research laboratories.

SURVEY ON COMPETENCE ACQUISITION AND PARTICIPANT FEEDBACK ON WORKSHOP METHOD

Following the co-creative group work, the groups presented the scenarios to each other. A pre- and post-workshop survey was developed by IFAI and initiated by the workshop facilitators (via Typeform).

Participants survey before online workshops (average)

The participants were asked about their competence on marine topics on a scale of 1-10. 55% of the participants stated that they had rather little competence (scale 1-5/10), 25% were in the medium range (6-7/10) and 20% in the high range (8-9/10). Their assessment of the relevance of marine issues were **1)** Economic area **2)** Community factor **3)** Sea as a factor of longing **4)** Habitat **5)** Climate factor respectively. Deriving from this - sea is not sufficiently assessed as a climate factor. 80% of the participants were determined their own creativity as medium before the workshop, and 60% were not aware of co-creation methods.

The participants were also asked open-ended questions with free choice of words:

Q1 What matters most when it comes to marine issues?

- Animal and plant protection or marine protection
- Human health and healthy ocean
- Increase social/public understanding of marine issues

Q2 What worries you the most about oceans?

- Perceiving future fears of younger generations, e.g., that oceans will tip over
- Littering
- Exploitation of the deep sea
- No action to protect the oceans
- How can co-living with the ocean succeed?
- Stop biodiversity loss

Q3 What are your expectations of the workshop?

•Learning and ideas •Learning about future prototyping •Curiosity •Input •Networking •Exchange of ideas •Inspiration •Knowledge growth and exchange •Learning to look positively into the future

Participants survey after online workshops (average)

After the workshop, 55% of the participants stated that their understanding of the importance of the oceans changed. 75% said they enjoyed the workshop and all participants stated that the workshop inspired them to pursue the topic further. What they liked most about the workshop was introduction to workshop topic/ method, workshop structure and inspiration and group work respectively. 95% of the participants found the steering towards positive future scenarios to be good. 75% of the participants felt that the creativity of the group was high and all of the participants said that their expectations of the workshop were met.

Q1 What do you take away for yourself after the workshop?

- Initiate pilot projects
- Getting to know other ways of looking at things
- New knowledge about the state of the oceans
- Use type of engagement for artistic project work with students
- Initiate citizen science projects
- Bring in personal active engagement
- Further engagement with algae research

Q2 What did you think of the co-creation?

- Good mixture of participants
- Group dynamics was partly medium-difficult
- Group work was great experience
- Ideas were great
- Got a lot of knowledge
- Diversity was great
- Got to know many perspectives
- Inspiring, very substantial, very productive

Q3 What did you particularly like about it?

"The online board was well designed"
"Looking at topics from other angles opens up possibilities for new ideas"
"Awe, love, and connection"
"More interdisciplinary and transdisciplinary exchanges and other funding structures encourage innovation and collaboration"
"Future prototyping needs to be applied to other subject areas"

EVALUATION OF FACE-TO-FACE-WORKSHOPS

The face-to-face workshops each had a location-based focus. In Bremerhaven, the focus was on the city by the sea in 2050. In Stralsund, the focus was on the maritime museum of the future. The participants of the workshop in Berlin tested the new Future Box “Oceans”, which also deals with various future scenarios and stimulates discussion. In addition, a fourth workshop was offered at Berlin International University as part of the “Sustainable Systems for the Future” conference with international students, which used the same method and focus as the online workshops.

On Tuesday, May 31, 2022, the German Oceanographic Museum in Stralsund offered co-creation and dialogue around the controversial topic "How do we want to live with the oceans?". After a guided tour by curator Dr. Dorit Liebers-Helbig, four groups of interested citizens and experts from the fields of science, innovation and art jointly developed positive future scenarios with regard to mediation and cooperation with science.

DMM, Stralsund

In the concluding short presentations, the groups and their moderators presented narratives, values and co-created scenes. This was followed by an event from the series "Science Controversial", which was opened by dancers from the Stralsund-based PerformDance association. At the following fishbowl panel, moderated by Fritz Habekuß (journalist at Die ZEIT magazine), Ann-Katrin Schröder from the art project TAINTEDoceanLOVE, Heike Vesper, biologist and WWF head of department for marine protection, and Prof. Dr. Burkard Baschek, director of the German Oceanographic Museum, discussed under the original-sized 1:1 giants of the seas, a model of whales hanging in the room.

On Saturday, June 25, 2022, the German Maritime Museum in Bremerhaven invited visitors to co-create and engage in dialogue around the multi-faceted question "How do we want to live with the oceans?" The day began with a guided tour of the special exhibitions in the extension building CHANGE NOW, DATEN LAUSCHEN and INTO THE ICE by curator Dr. Ulrike Heine. Afterwards, interested citizens and experts were invited to co-create desirable future scenarios for the port city of Bremerhaven. The groups presented their results in a final short presentation. The Ocean Future Lab aggregates these results as impulses and one narratives was selected to get artistically visualized to inspire a broader public for the topic.

On August 26, 2022, the Ocean Future Lab took place at the Futurium in Berlin. The Futurium is a project initiated by scientific institutions and networks of several companies and foundations as well as the German government in Berlin. It is a house of the future that offers a place for presentation and dialogue on science, research and development. The day began with a guided tour of the exhibitions by Dr. Christian Engelbrecht, education officer of the Futurium. Afterwards, the participants were invited to the Futurium Lab, where he introduced the concept of "Future Boxes", an educational toolbox. This was followed by an impulse from Dr. Ute Wilhelmsen, Head of Transfer at the German Alliance for Marine Research (DAM). The new "Oceans" future box, which offers a variety of perspectives on marine topics and invites people to explore futures in a playful way. The materials are based on methods of futurology, education for sustainable development and design thinking. Workshop participants from the fields of education, innovation, science, politics and business tested the prototype. Improvements and possible areas of application were also discussed.

Participants survey before face-to-face workshops (average)

The participants were asked about their competence on marine topics on a scale of 1-10. 40% of the participants stated that they had rather little competence (scale 1-5/10), 20% were in the medium range (6-7/10) and 40% in the high range (8-9/10). Their assessment of the relevance of marine issues were **1)** Sea as a factor of longing **2)** Economic area **3)** Climate factor **4)** Community factor **5)** Habitat respectively. 70% of the participants determined their creativity as medium before the workshop, and 60% were not aware of co-creation methods.

Q1 What matters most when it comes to marine issues?

- Preserving diversity/stopping biodiversity loss
- Protection of flora and fauna
- Climate factor, global warming
- Sea belongs to the western world
- Origin of life, habitats
- Hope for society-wide commitment to marine protection
- Invisible habitat - seas should remain untouched
- Rehabilitation of ecosystems
- Connectedness with the sea - vital basis should be preserved
- Sustainable management, diversity

Q2 What worries you the most about oceans?

- Exploitation and warming of the sea
- Biodiversity loss
- Littering
- Exploitation of the deep sea
- No action on marine protection
- Sea level rise
- Overfishing and limitless exploitation

Q3 What are your expectations of the workshop?

- Increase and exchange knowledge
- Learn to look positively into the future
- Lead better projects
- Ideas for a better world
- Vision for a sea at eye level
- Networking
- Interdisciplinary exchange
- Inspiration and impulses
- Get to know co-creative processes

Get to know the future prototyping method

Participants survey after face-to-face workshops (average)

After the workshop, 50% of the participants stated that their understanding of the importance of the oceans changed. 75% said they enjoyed the workshop and 90% of the participants stated that the workshop inspired them to pursue the topic further. What they liked most about the workshop was introduction to guidance, introduction to workshop topic/method, workshop structure and inspiration and group work respectively. 95% of the participants found the steering towards positive future scenarios to be good. 75% of the participants felt that the creativity of the group was high and all of the participants said that their expectations of the workshop were met.

Q1 What do you take away for yourself after the workshop?

- Gained knowledge about existing solutions
- Follow up Ocean Science and Art
- Work out visualization of the narrative
- Develop story and animated film (play)
- Bring in more own active engagement in ocean protection
- New methods for science communication and environmental education
- Decision for voluntary internship at the Marine Institute
- Inspiration for interdisciplinary thinking
- Organize exhibitions and events for better marine conservation
- Use more performing arts for marine issues
- Artistic project work with students
- Initiate Citizen Science projects
- Interest in algae research

Q2 What did you think of the co-creation?

- Good and informative atmosphere
- Group composition perfect
- Inspiration
- Learning together
- Productive collaboration
- Goal-oriented communication
- Increase in knowledge
- High diversity of perspectives

Q3 What did you particularly like about it?

"Future prototyping should be used as a method in different disciplines"

"Good mix of input, guidance, stimulation, time for creativity - very balanced mix"

"Very creative, interactive and process oriented"

"The afternoon was amazingly productive and entertaining"

"Exchange with female experts was super"

"The interdisciplinary exchange was great"

"We have time every day to advocate for the only blue planet"

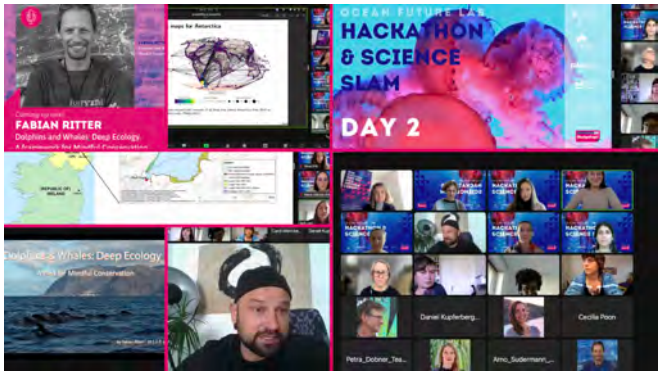
"Oceans are possibly important in the future"

"We need to make it possible for as many people as possible to experience the ocean and its needs and protect it"

EVALUATION OF HACKATHON

This collaborative format for idea development and improvement was organized by the Institute for Art and Innovation. Within a limited time frame, 7 promising teams (selected after the Open Call) were enabled to further think with the public and invited experts, innovative and sustainable solutions....

On Wednesday, September 21, 2022, 133 people gathered, ready to contribute their skills and competencies to accelerate the teams' solution ideas. After a round of introductions of the participants, Nicole Loeser (IFAI Berlin) gave a short introduction to the Ocean Future Lab and the Hackathon and Science Slam program. During the first intro sessions, different ideas and perspectives around saving the oceans were shared. In addition to teamwork, a science slam was offered (i.e., short stimuli for the participants followed by a Q&A round). The first science slammer was Louise Fuglsang from Futurice, a digital transformation consulting agency, who pointed out that one almost has to love the problem to solve it.



On Thursday, September 22, 2022, the participants kicked off a productive day starting at 9 am. An hour later, polar expedition photographer Manolo Ty came on stage with a presentation. His message: people need to be emotionally involved in problems, so work with strong images and stories to create understanding and open hearts and minds. Next, marine biologist Fabian Ritter spoke about "Dolphins and Whales: Deep Ecology." One lesson from this was to work with nature, not against it, and that mammals like whales and dolphins are capable of thinking and feeling just like humans - so more mindful conservation should take place. After the lunch break, geoscientist and physicist Laura Barth provided valuable insights into the daily routine of Antarctic expeditions. Her innovative research approach helps retrieve data to better and more safely reach an icy continent, rather than using common, unreliable weather forecasts. Soli Levi then opened her slam with a poem of her own. Her expertise is in coastal and ocean policy, geographic information system technology, and education. In her doctoral dissertation, she shows how emotions need to be connected to science in order to gain better insights.

On September 23, 2022, the teams continued to work on their ideas and pitches with their new colleagues and mentors. In the afternoon, they finally presented their well thought-out ideas to a six-headed expert jury consisting of Dr. Marko Freese/ Institute for Fishery Ecology, Dr. Neele Meyer/ Klimahaus Bremerhaven, Jörg Altekruse/ Youth4Planet, Nicole Loeser/ IFAI Berlin, Michael Adler/ Agency "tippingpoints" for sustainable communication and Matthias Goerres/ BUND Federal Working Group - Sea and Coast.

In the evening, the public announcement of the winners of the three Ocean Future Ambassadors took place: the teams of **Plapla! The Swimming Whale (PP)** and **Upstream Algae Shopping Spree (UASS)** jointly took second place. The first place went to the team from **Float-Generator (FG)**. All three teams qualified to participate in the Entrepreneurship Summit at the Free University Berlin, where they were able to present their ideas to a wider audience.

Award Ceremony at the Entrepreneurship Summit

Feedback from the three winning teams after participating in the hackathon (survey via Typeform)

UASS : Upstream Algae Shopping Spree
FG: Float Generator
PP: Plapla! The Swimming Whale

Q1 How much did you enjoy the hackathon?

UASS	9/10
FG	8/10
PP	7/10

Q2 What knowledge transfer took place?

UASS	1. Interdisciplinary work, 2. presenting skills in different formats, 3. storytelling.
FG	1. There is a big gap between science and art to address common problems and/or create synergies. 2. The hackathon format is useful for gathering ideas and stimulating interdisciplinary collaborations, but should lead to a follow-up process or be used as a networking/coaching tool within a longer project process. 3. There is a great demand (and potential) from both sides, science & arts, to undertake joint efforts towards common goals.
PP	Acceleration of the interdisciplinary project development was successful.

Q3 Were expectations met?

UASS	YES
FG	YES
PP	YES

Q4 What goals did you achieve?

UASS	We have improved our pitch and branding, and professionalized our concept.
FG	We developed our various non-specific ideas into a realistic implementation concept and got inspiration, feedback and contacts from the scientific community.
PP	The presentation was further developed and new contacts in the scientific community were established.

Q5 What was most important during the hackathon?

UASS	Meeting experts from other disciplines such as marine biologists.
FG	Seeing and feeling the passion, knowledge, and openness of the organizers and mentors to creative visions and innovations.
PP	The exchange with the experts.

Q6 Did the hackathon inspire you?

UASS	YES
FG	YES
PP	YES

Q7 What are the next steps after the hackathon?

UASS	Better material development in cooperation with marine scientists, researchers, chemists; realization of performance art projects in cooperation with art universities.
FG	Development of digital platform and campaign
PP	Realization of ideas (knowledge platform, exhibition series, participation formats)

PROCESSING THE QUESTIONS FROM THE IDEA RUN OF THE GERMAN SCIENCE YEAR 2022 (EXAMPLES)*

WHAT IS THE UNITED NATIONS CONTINENTAL SHELF COMMISSION?

First of all, what is the continental shelf anyway? The answer: the continental shelf extends from the ocean coast to the beginning of the deep sea zone. But why does there need to be a United Nations commission for this region? It is because this term has a special meaning in the International Law of the Sea. This determines the framework with regard to economic interests such as fishing, shipping or the extraction of oil and gas as well as other raw materials.

In principle, states have the right to explore and exploit natural resources on the continental shelf up to 200 nautical miles off their coast. However, continental shelves vary in width depending on geological conditions - that is, even more than 200 nautical miles. In this case, a state can apply before the - here it comes - UN Continental Shelf Commission to be granted sovereign rights regarding natural resources there as well. To do so, it must prove that the area is indeed a natural extension of its land territory. The commission examines the request and then makes a recommendation. Based on this recommendation, the external boundaries of the continental shelf are established in a binding manner. It is therefore officially called the UN Commission on the Limits of the Continental Shelf (CLCS).

More information:

World Ocean Review 1, "Living with the Oceans - A Report on the State of the World's Oceans," 2010, Chapter 10 "The Legal Order of the Oceans,", https://worldoceanreview.com/en/wor-1/law-of-the-sea/a-constitution-for-the-seas/

WHY IS CLIMATE CHANGE CAUSING MORE STORMS?

The findings of the World Climate Report, the first chapter of which was published in the Sixth Assessment Report in August 2021, show that "human-induced climate change is already affecting many weather and climate extremes in all regions of the world. Since the Fifth Assessment Report (AR5), there has been stronger evidence of observed changes in extremes such as heat waves, heavy precipitation, droughts, and tropical cyclones, and particularly of their attribution to human influence." He continued, "Many changes in the climate system are becoming larger in direct relation to increasing global warming. These include increases in the frequency and intensity of heat extremes, marine heat waves, and heavy precipitation, and in some regions, agricultural and environmental droughts; an increase in the proportion of violent tropical cyclones; and declines in Arctic sea ice, snow cover, and permafrost."

Read it here, in the document "Summary for Policymakers: https://www.de-ipcc.de/350.php

According to this, tropical cyclones in particular are becoming more frequent and more severe. This is due to the following: Hurricanes, cyclones and typhoons derive their energy from the temperature of the sea beneath them - the warmer the water, the higher wind speeds the storm can develop. Accordingly, it has greater destructive power when it hits land. Moreover, this phenomenon can occur with heavier rainfall. The more the seawater warms due to climate change, the more evaporation occurs at the ocean surface. The increasingly warmer air contributes to this - it can absorb more moisture. Such higher evaporation rates over the sea increase the intensity of heavy rain events, for example. One example of this was Tropical Storm Imelda, which hit the southeastern U.S. state of Texas in mid-September 2019, causing major flooding due to its exceptionally high rainfall.

More information:

Intergovernmental Panel on Climate Change Sixth Assessment Report, August 2021, Chapter 11: "Weather and Climate Extreme Events in a Changing Climate," download here: https://www.ipcc.ch/report/ar6/wg1/

World Ocean Review 7, "The ocean as a guarantor of life - sustainable use, effective protection," 2021, in Chapter 2 "The ocean in climate change - the fatal consequences of heat," https://worldoceanreview.com/en/wor-7/oceans-under-climate-change/the-fatal-consequences-of-heat/

*More on www.oceanfuturelab.de

HOW IS THE SOUND POLLUTION OF THE OCEANS ASSESSED?

We humans generally assume that it is quiet under water. But this is wrong. There is a natural soundscape that is fed by a wide variety of biological and geological sources - be it the wind in the water, currents on rocks, or whales and seals communicating with each other through sounds. But there are also man-made sounds: ship engines, trawl nets on the seafloor, blasting and pile driving for underwater structures such as offshore plants are just a few of them.

The extent of this exposure is shown, for example, in a meta-analysis published in the renowned scientific journal Science in 2021 (Duarte et al. Science 371 (2021), DOI: 10.1126/science.aba4658), for which around 500 studies were evaluated. It says that the pitches of ocean noise are largely right in the range in which marine animals communicate with each other. One consequence is that they can no longer communicate properly. One example, according to the analysis, is that over the past 50 years, ever-increasing shipping traffic has increased low-frequency noise along major routes by an estimated 32 times.

There are now hardly any places in the sea without "artificial" noise. One exception is the Weddell Sea off Antarctica. Here, researchers from the Alfred Wegener Institute (AWI) set up fixed underwater recorders in 2006. Since then, the scientists have been tracking in a long-term study how natural sounds sound underwater and how humpback whales, for example, communicate and behave (Schall E., Thomisch K., Boebel O., Gerlach G., Spiesecke S., Van Opzeeland I., Royal Society Open Science 7 (2020), https://doi.org/10.1098/rsos.201347).

Sounds underwater are not always the same either. They vary - depending on temperature, salinity or pressure. This is because sounds themselves are pressure waves that compress and decompress molecules in the water. When the water is warmer, the molecules vibrate faster, allowing the sound waves to travel faster. The pressure is higher the deeper you go. To measure this, researchers use, for example, so-called hydrophones, underwater microphones that measure pressure differences.

Artist: Jan Schneider

IMPACT

The inspirational collaborations during the transdisciplinary science communication project in the context of the German Science Year 2022 - Participate! will lead to further approaches in the future. The participation workshops with scientists and artists were found to be very creative, hopeful and action-oriented. In addition to the teaching of the co-creation method for the joint exchange of knowledge on sustainability topics relating to coasts, seas and oceans, as well as future scenario development, the exploration of solution approaches for a positive future design was felt to be particularly enriching. The co-creation approach is particularly suitable for marine issues that are complex and difficult to communicate, as a solution for awareness-raising science communication and transdisciplinary knowledge aggregation.

The co-creative collaboration of the transdisciplinary teams enabled the following changes on the level of knowledge and attitudes of the participants:

- Knowledge aggregation, e.g., generating a vision for cluster of excellence in Rostock on salvage of wartime munitions and ordnance.
- Concrete ideas for solutions
- Knowledge transfer about existing and future innovations, as well as generation of new innovation ideas, which focus on the cooling of the oceans, their purification as well as CO2 reduction and maritime agriculture.
- Positive visions of the future lead to more interest in solution approaches, also with regard to complex challenges, e.g. coexistence with marine animals is aimed for on floating platforms.
- Scientific perspectives have been integrated into societal issues, e.g. the sea serves as a place of desire for socio-political, economic and cultural innovations, including innovative, more unbound lifestyles and interdisciplinary and intergenerational work situations ("sea-citizen")

Changes at the level of behavior and action:

- Interest in realization of art-science projects.
- new educational formats for museum visitors
- openness of museums for participation, e.g. participation campaign

Longer-term impacts on the level of society:

- Merging of science and citizen science
- Sustainable use of marine resources
- Awareness of marine life in society
- Better alignment of social-ecological and economic interests in relation to the oceans
- Achievement of SDG6, SDG12, SDG13. SDG14

The website provides access at any time to the project results, educational and participatory formats that will continue to be used as part of the UN Decade of Marine Research for Sustainable Development. Particularly worth mentioning here are the Future Box "Oceans", which can be used as a toolbox in the school sector. Another service is the presentation of comprehensible overviews of residual marine topics based on scientific facts (www.oceanfuturelab.de/meerwissen), the marine-related questions from the Science Year 2022 and the answers to them (www.oceanfuturelab.de/meer-fragen).

WORKSHOP–METHOD

The methodology of the participatory Ocean Future Lab can be applied to future events and further locations. Already during the term an OFL - workshop in presence for 21 students was requested by the Berlin International University and carried out on October 15, 2022 to present the workshop method and the co-creative development of positive future designs and to test it with international business as well as design and architecture students and alumni.

The Bremerhaven Maritime Museum will also continue to use the workshop participation method, including for a workshop series in conjunction with the crowdmapping app. IFAI has been a consortium partner of an EU Erasmus+ project since October 2022 and will introduce the Future Prototyping method to the other 9 partners of the "Green Education in Media" project (GEM) and use it for co-creation workshops.

"FUTURE BY THE SEA" PARTICIPATION CAMPAIGN

At the Ocean Future Lab workshop in Bremerhaven, the participants wanted to continue the discussion about the future of Bremerhaven as a coastal and port city on a larger scale and more visibly. Together with the DSM's digital curator, Dr. Isabella Hodgson, project leader Dr. Ulrike Heine developed a banner based on the OFL method that was placed in the DSM's outdoor space. There it will guide people to design visions of the future from November 2022 to June 2023. These visions of the future are to be entered in the form of text, images or audio files into a digital map application developed at the DSM for participatory projects (map.dsm.museum).

A postcard enables the analog submission of future narratives. In this case, the DSM takes care of the entry. The scientific objective for the DSM associated with this hybrid participatory campaign is the study of identity formation in port and coastal cities.

A module based on the OFL method and focusing on the future was incorporated into a series of workshops on the aforementioned mapping app, which was implemented with a dive.in grant. The Ocean Future Lab was thus presented in Gdansk (Poland) and Hamburg (Germany), among other places, and future prototyping was tested with a view to life on the coast.

OFL INNOVATION–ARCHIVE

A further development of the innovation archive, which was developed and used by IFAI for the Ocean Future Lab, towards a 3D Lab is being planned.

In a first step, 27 participants were invited to a workshop on November 28, 2022 at the Film University Babelsberg to get to know the Ocean Future Lab innovation archive and to develop ideas for future scenarios in the context of a cooperation with the World Building Institute in Los Angeles.

HACKATHON–FORMAT

IFAI would like to use the experience gained from the hackathon again in an EU project (AT: STYX, application in the Horizon Europe Program). Here, scientific institutions want to gather ideas for the protection and purification of water bodies in Europe and improve them through a mentor principle during a hackathon and bring prototypes to implementation. As an experienced partner, the IFAI will take over the moderation.

FUTURE BOX “OCEANS”

What will our seas of tomorrow look like? Within the framework of the OFL, DAM has developed the Future Box "Oceans" together with the Futurium. It can be used in a playful workshop format to discuss various future scenarios on this question. The materials enable the participants to discuss ideas for sustainable futures for our oceans and to develop creative impulses and visions together. The materials are based on methods of futurology, education for sustainable development and design thinking. They are suitable for students of all school types from grade 7 onwards.

The Future Box "Oceans" contains a total of five different sets of cards as well as methodological instructions for creating future scenarios.

The toolbox was designed for working in teams of 5. One set contains materials for six small groups. In the teams, possible future trends are to be discussed and evaluated.

For example, the question of whether we should build more floating cities in the future to counter rising sea levels. What is desirable and what is not desirable about this scenario?

The material is described and offered for download via the Ocean Future Lab's website: www.oceanfuturelab.de/zukunftsbox-meere.

The first edition of 200 boxes has already been sold out and will be reprinted shortly. Already today, the Future Box "Oceans" has proven to be an extremely sustainable and perspective-useful product of the OFL, which can be widely used especially in schools as well as in exhibition houses such as the Futurium to promote the development of one's own future perspectives for living with the oceans.

NARRATIVES & ARTISTIC VISUALIZATIONS

In the 20 groups that participated in OFL workshops, different future scenarios were developed.

Selected results of the co-creative processes were visualized by invited or participating creatives. Graphic recording, drawings, graphics as well as concept arts, renderings and animations were created. The resulting future images and animation ensure the cultural mediation success of the project. In the long term, the OFL visualizations will enter the collective consciousness in various ways: in exhibitions of the participating museums, in social media presentations, and on the website (www.universal-sea.org), which can be expanded in a modular way for follow-up projects, including in the context of the UN Decade of Oceans.

The 6 visualizations were published as a blog post at www.universal-sea.org and are thus available to interested parties for further discussion. The visualizations were realized by Sebastian Esposito, Jan Schneider, Daniel Kapferberg, Gabriella Goncalles, Katharina Grewe and Chrispy Simon.

In February 2023, the project partners will meet with the workshop participants as well as museum education departments and colleagues from press and public relations together with the artists to explore possibilities for further dialogue formats and exhibition opportunities.

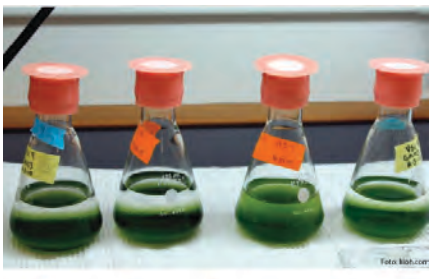
ALGAE

www.ubm-development.com

ecoLogicStudio: Die Alge als neuer Mitarbeiter - ubm magazin.

Das Londoner Urban-Design-Büro ecoLogicStudio will mit Algen nicht nur die Luft säubern, sondern auch architektonische Grenzen verschieben.

Algae Harvesting: Harvesting algae biomass as a future natural resource. By removing abundance growth of algae, nutrients and toxins in the water are reduced, spread of anoxic sediments is prevented, reproduction of fish improves and the tourism industry will also benefit.



naturwissenschaften.ch

Treibstoff aus Algen

Energie produziert aus Mikroalgen als Ersatz für fossile Brennstoffe

AQUACULTURE

de.wikipedia.org

Aquaponik - Wikipedia

Aquaponik ist ein Verfahren, das Aquakultur (Aufzucht von Wassertieren wie Fischen, Krebsen, Schnecken oder Garnelen in Becken) mit Hydroponik (Kultivierung von Nutzpflanzen im Wasser, z. B. Gemüse oder Kräuter) koppelt. Dabei sind nitrifizierende Bakt...

kelp.blue

Kelp Blue - Blue water farming for a sustainable planet

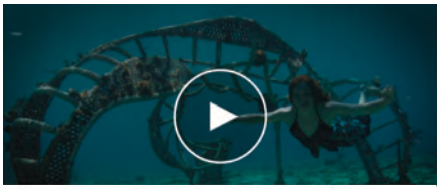
One of the fastest growing organisms on earth It creates habitats for many marine species It's an amazingly efficient carbon sink It can be sustainably and repeatedly harvested for at least 7 years It provides valuable extracts including protein,

www.alpha-aqua.com

Alpha Aqua - The global future of aquaculture - Alpha Aqua

By working with modules at ALPHA, we are taking the extra steps needed to avoid down-time of operation, increase safety by redundancy, allow isolation of production within the same system, and create a system that is prepared for expansion,

BIODIVERSITY



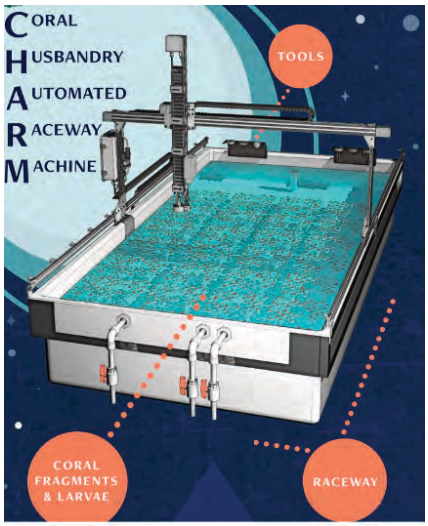
Living Sea Sculpture - Coral Reef Restoration

Art, science, and technology working together for coral reef restoration to rebuild coral habitats, protect coastal areas, and ocean ecosystems. Artistic ways to combat climate change, coral bleaching, and reef die out.

SP www.sharkproject.org

Shark Safe Barrier | SHARKPROJECT

Bei der Entwicklung der SSB wurden wissenschaftliche Erkenntnisse und naturnahe Beobachtungen kombiniert.Der professionelle Haitaucher Maik Rutzen aus Südafrika beobachtete bei seinen Tauchgängen, dass junge Robben vor der Verfolgung durch Weiße Haie in...



CHARM: An innovative coral farming robot, combines scientific research with computer automation to reduce costs, save time, and grow resilient coral colonies at economies of scale.

BLUE BIOTECHNOLOGY

www.scinexx.de

Uran aus dem Meerwasser

Fädige Uranfänger: Forscher haben erstmals Uran direkt aus Meerwasser gewonnen - eine absolute Premiere. Dies gelang mithilfe von absorbierenden

www.umweltinstitut.org

Gerichtsurteil zu Gen-Lachs: Zulassung verstößt gegen Umweltrecht

Die Zulassung von genmanipuliertem Lachs in den USA verstößt gegen Umweltrecht. Dies urteilte ein Gericht in Kalifornien. Dennoch sollen die Turbo-Lachse noch dieses Jahr auf den Tellern der US-Amerikaner:innen landen.

www.biologie-seite.de

Algenreaktor - biologie-seite.de

Als Algenreaktor oder Algenbioreaktor bezeichnet man einen Photobioreaktor zum Kultivieren von Algen, in den Kohlenstoffdioxid eingetragen wird. Die heranwachsenden Algen nutzen das ihnen zur Verfügung gestellte CO 2 und Sonnenlicht, um Photosynthese zu...

BUILDING MATERIALS

www.reuters.com

Kenyan recycles plastic waste into bricks stronger than concrete

Nzambi Matee hurls a brick hard against a school footpath constructed from bricks made of recycled plastic that her factory turns out in the Kenyan capital.

www.goodnewsnetwork.org

Stanford Designer is Making Bricks Out of Fast-Growing Mushrooms That Are Stronger than Concrete

Using mycelium, Bay-area designer Phil Ross creates an 6X6 arch out of mushroom roots turned into bricks, and he wants to build a house next.

Treehugger

www.3dwasp.com

The first 3D printed House with earth | Gaia

The first 3d printed house Gaia by WASP built with local earth and natural materials derived from the waste of rice's production.

FLOATING HOUSES

blog.richardvanhooijdonk.com

Artificial islands could offer a solution for climate migrants and the growing global population - Richard van Hooijdonk Blog

Man-made islands could ease the climate migration crisis One of the biggest artificial islands in the world will be constructed in Hong Kong

www.jetsongreen.com

Underwater Floating House

www.orissapost.com

In this village people live on boats, never come on land

This community in southeast China is home to 7,000 fishermen refusing to conform to modern lives, remaining in their traditional floating homes on the sea. The Tanka people, also called boat people or 'gypsies of the sea' can be traced back to the Tang ...

INNOVATION ARCHIVE

FLOATING STRUCTURES

newatlas.com

Lilypad floating city concept

www.innovatorsmag.com

Floating city to be self-sustainable

The South Korean city of Busan recently signed an historic deal to build the world's first sustainable floating city. Blue tech pioneer and

www.welt.de

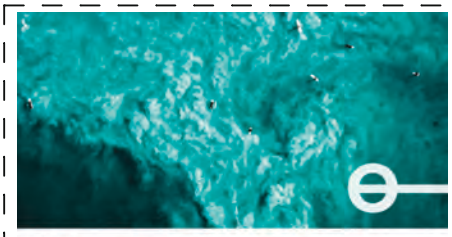
Stadtplanung: Künstliche Inseln für 50.000 Einwohner geplant - WELT

inhabitat.com

Noah's Ark is a Sustainable Floating City for a Post-Apocalyptic World

Aleksandar Joksimovic and Jelena Nikolic are from Serbia and designed Noah's Ark, a sustainable floating city, for the 2012 eVolo Skyscraper Competition. Their hope was to

HUMANITY LAB



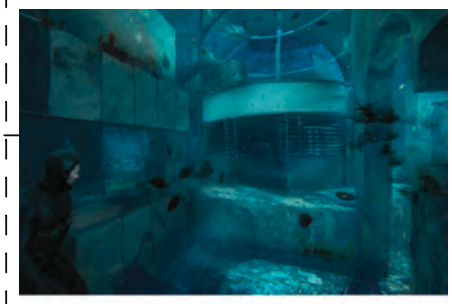
www.royalsociety.org.nz

Arts + Climate Innovation | Tauranga

Mon 20 August 6.00pm Can the arts inspire action on climate change? A timely conversation with climate scientists James Renwick and Craig Stevens with facilitator Sarah Meads and local artists. Presented by Track

de.wikipedia.org

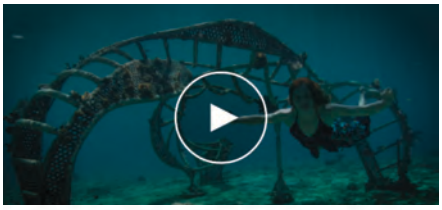
Mein Lehrer, der Krake - Wikipedia



modos.ac.nz

BiodiverCity: Cohabitation between Human and Fish

Architecture needs to have a new era of 'biodiversity' to fix the mistakes people have made to nature.



Living Sea Sculpture - Coral Reef Restoration

Art, science, and technology working together for coral reef restoration to rebuild coral habitats, protect coastal areas, and ocean ecosystems. Artistic ways to combat climate change, coral bleaching, and reef die out.

ORGANIC FISH FARMING

www.biopress.de

Bio-Fisch gehört die Zukunft

Etwa 140 Millionen Tonnen Fisch werden weltweit jährlich produziert. 40 Millionen Tonnen des Bedarfs werden mittlerweile von Farmen gedeckt. Das sind rund ein Drittel der

imbstudent.donau-uni.ac.at

Fairer Lachsgenuss dank Blockchain Blockchain - Mehr als nur Krypto

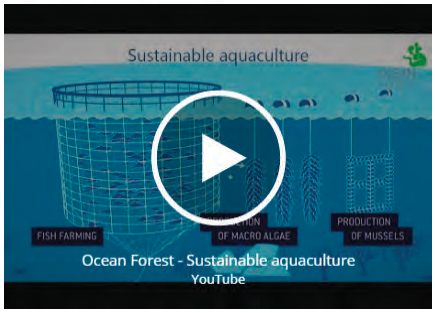
Woher kommt eigentlich der gekaufte Lachs? Fairer Lachsgenuss wird durch Blockchain garantiert und die Produktgüte verifiziert.

RECIRCULATING FARMS COALITION

www.betterfishfarming.org

Sustainable Aquaculture | Better Fish Farming

We can raise fish and grow plants almost anywhere - recirculating farms are environmentally friendly, generate very little waste and don't risk invasive fish and pollutants escaping into nearby waters. This is better fish farming! The list of foods you ...



INNOVATION ARCHIVE

PLASTIC IN SEA

www.clearrivers.eu

Clear Rivers | For a plastic free sea!

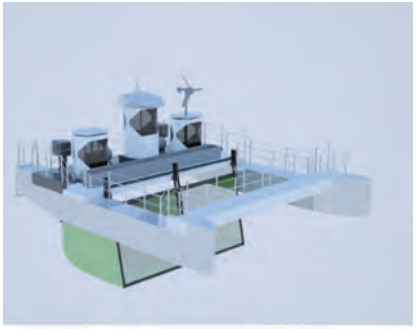
For a plastic-free sea! Preventing plastic from reaching the oceans. Our mission is to preventing plastic from entering the oceans. Through the five pillars of our approach, we can achieve the halt on plastic pollution

plastic-revolution.org

The Great Bubble Barrier - Plastic Revolution

de.euronews.com

Dieser schwimmende "Kontinent" ist autark und reinigt den Ozean



www.forum-csr.net

Die Seekuh - startet durch und säubert die Meere

SOCIETY LAB

www.welt.de

Wie Designer die Zukunft von Schiffen sehen - Bilder & Fotos - WELT

Schwimmende Städte, inspiriert von Seerosen, Kreuzfahrtschiffe im James-Bond-Look, Privatyachten mit Vulkan und Wasserfall an Bord - so könnten die schwimmenden Urlaubspaläste der Zukunft aussehen.

www.derstandard.at

Rückkehr der Mangrovenwälder in Indonesien

Die Zerstörung von Mangroven hat dramatische Folgen für Küstenschutz und Fischerei. Auf der Insel Java in Indonesien testet man eine Methode zur Regeneration der Wälder.

www.seagoinggreen.org

Scuba Projects: Bringing Ocean Conservation Awareness to Local Communities - Sea Going Green

We feature Scuba Projects, an initiative to spread awareness about ocean conservation while engaging the local community in stopping plastic pollution through cleanups.

WATER TRANSPORT

www.ecodesign-beispiele.at

Solarboot

Das Solarboot SunCat 21 von Solar WaterWorld sieht nicht nur elegant aus, es benötigt keinen Sprit und verfügt bei Sonnenschein über eine unbegrenzte Reichweite. Solarschiffe sind Schiffe oder Boote, die mit Sonnenenergie (z.B. Photovoltaik) angetrieben...

de.wikipedia.org

Tûranor PlanetSolar - Wikipedia

Die Tûranor PlanetSolar (Arbeitsname vor der Taufe PlanetSolar) ist ein am 25. Februar 2010 offiziell enthüllter und am 31. März 2010 getaufter Katamaran, der ausschließlich mit Sonnenenergie angetrieben wird. Aus diesem Grund besteht das gesamte Deck a...

www.cbsnews.com

Hydrogen-powered ferry launched to combat climate change

The future of sea travel could be here -- and it just might help save the planet. A hydrogen-powered ferry that produces zero emissions will soon launch in the San Francisco bay. Ben Tracy has the story.

INNOVATION ARCHIVE

DEEP SEA RESEARCH STATION

ONLINE WORKSHOP 1 – GROUP 2

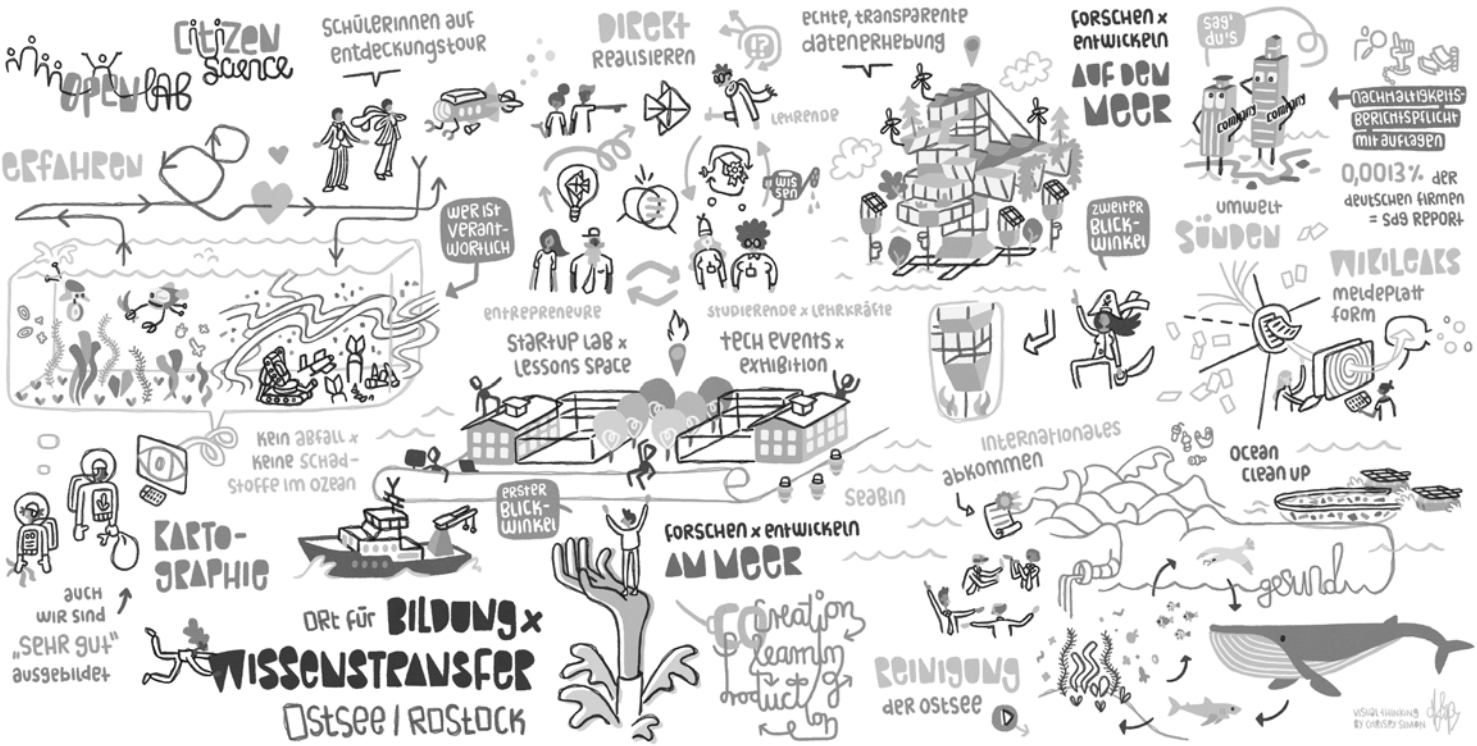
Visualization: Jan Schneider

The topic is Ocean Lovers. In 2050, there will be an island where all visitors can get the statues of being a citizen of the sea. As such they take on the responsibility for protecting the oceans. And when they go home to their residential areas they will dedicate a certain time to awareness raising and also they will spend a certain amount of money towards organizations for ocean protection. The island is based on a circular economy, especially on aquaponic. There Vincent Callebaut, a Belgian architect is meeting with Alexandra Cousteau, the co-founder of Ocean 2050 dedicated to the reforestation of the oceans. Because on the island, a big urban planning project and change project is being developed. Besides the idea to erect cities on great islands in the oceans, they want to solve the issue of ocean warming, and the extinction of plankton. Both experts want to build specific elements to cool the oceans underneath these new islands. To cocreate these solutions many experts from science tech businesses and education are requested to be part of the lab.

OPEN SCIENCE CAMPUS

ONLINE WORKSHOP 2 – GROUP 1

Visualization: Chrispy Simon



The scene is located in the Baltic sea where the city of Rostock is a place for education and experience. In the Baltic Sea, a swimming part of the city is constructed. On this floating platform, there are very well educated trainers that give their experience and expertise to interested people during 2 months training.

The organizer of a campus on the terrestrial site of Rostock is also responsible for the floating platform. It is an ocean tech campus that is established where 16 scientific institutes consisting of 2000 experts working interdisciplinary together. It is a well known EU competency center for marine research. It is based on open source research and doesn't allow research for military purposes. Scientists and entrepreneurs as well as students and pupils are collaborating in different projects. The ocean tech campus is based on citizen science where also grammar schools can be part of research projects.

In an abandoned shipyard many different events and exhibitions are organized to help better co-working and co-learning. In such a way, start-ups can grow into huge agile organizations supported by European partners. In this regard, citizens of the future work closely together with scientists and enable students and researchers knowledge transfer and aggregation. Many open labs are established to allow practical lessons for scholars and students. These open labs are platforms for transparent data analysis and collection and help identify solution ideas and creating innovations e.g. ocean cleanup, Seabin.

There is also a new way of learning pathways which are now developed for the marine environment where students can learn about other species on the shore and in the sea.

In 2050, it is most relevant and urgent to salvage munition and second world war tanks out of the Baltic Sea. There is a new law that the producers of these old and rusty products have to pay for the extraction and recycling. This is how money can get collected for more innovation that is needed to realize these operations. Also the subsidiaries of fossil energy extractions are ended and are given now only to organizations that work in a sustainable way. In the focus of this WWII there is a huge project initiated that wants to clean the Baltic sea. The clean up is media-marketed and is realized in joint efforts of very diverse stakeholders. The highest focus lies in transparency on all existing problems and on clearing joined efforts for finding solutions and financial support. In that regard, a digital platform is created to allow citizens to indicate polluting companies. A kind of Wikileaks for polluters.

MAKRO MIKRO

ONLINE WORKSHOP 2 – GROUP 2

Visualization: Jan Schneider

In the future, there will be maritime farm yards called ‘green oceans’ . The communities live in harmony with the oceans and have established climate friendly businesses. Maritime agriculture is the interface between deep sea and terrestrial territory. It connects the ocean and land.

In 2050 there will be floating algae fields, on one hand to clean the oceans and to support de-acidification. On the other hand, to vaccinate fish with specific enzymes to digest plastic in their bodies. The algae fields serve the reduction of CO2. They are recognized as the bamboo of oceans as they grow very fast. Furthermore, the algae can be used as food for people and animals especially for sustainable maritime agriculture. Algae is known as a plastic substitute and is used in medicine, construction materials and clothing.

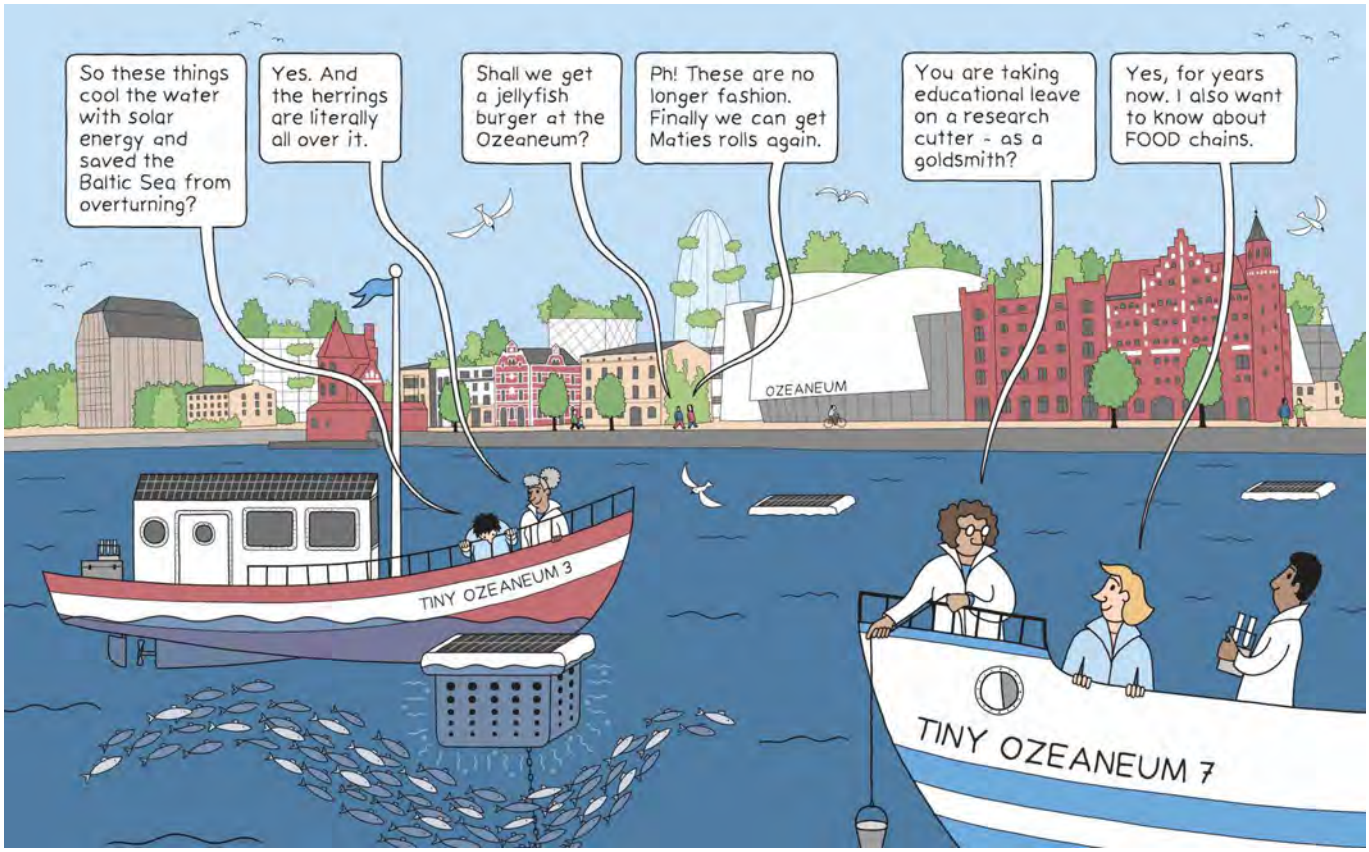
The vision is an agricultural cooperative between fish and humans where algae fields are protected areas to serve the marine species. Lots of new innovations are made in the circular aquaponic field.

Algae artists help to get a better understanding for these new farm yards in the oceans. They show the interdependence between micro cosmos and the macro cosmos.

THE LIVING MUSEUM

FACE–TO–FACE WORKSHOP, STRALSUND – GROUP 1

Visualization: Katharina Grewe



The Living Museum 2050 is localized in Stralsund and revolves around today's Ozeaneum, the maritime museum. In the imagined scene there, twins meet on a late afternoon. They are twelve years old and want to have something to eat after an interactive exhibition visit at the Ozeaneum. In 2050, it is a normality to order jellyfish burgers instead of herring and matie rolls, since there are hardly any fish left in the Baltic Sea. In the early evening, the two teens are invited on a flashlight tour. They meet up with the other participants in front of the aquarium. This museum tour is about finding out how the herring are doing. The museum is researching how to reintroduce herring to the Baltic Sea. With the flashlight, visitors can see where the herring are moving to. They also investigate the question of where the herring can be reintroduced into the Baltic Sea and where they will be most likely to spawn.

The Ozeaneum of the Future cooperates with the former fishermen. Their cutters have been moored in the harbors for a long time and were no longer used. Now, however, in 2050, the fishermen are on the move with their cutters as researchers. Their cutters serve as a research station and at the same time as an improvisation theater stage.

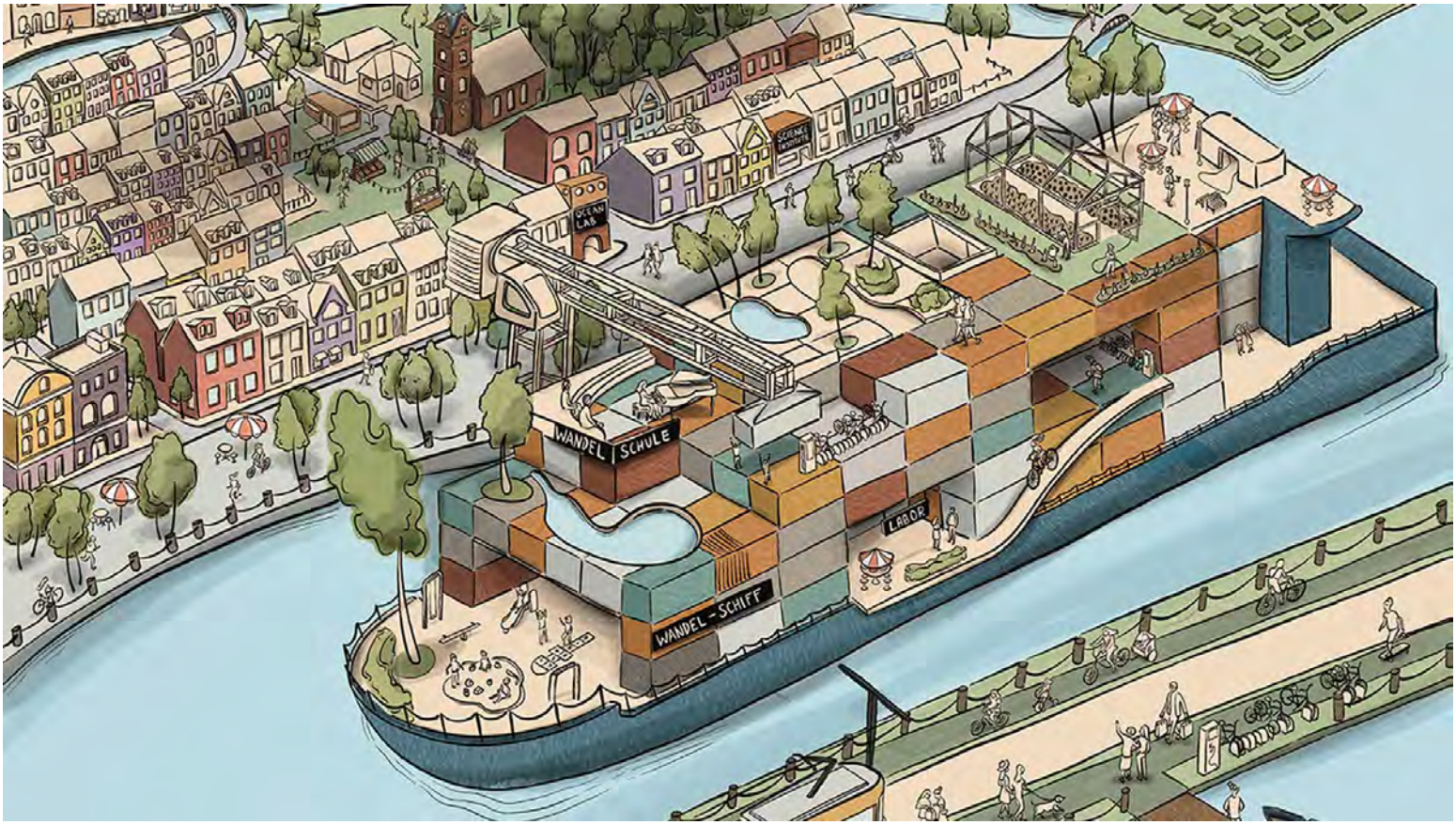
On the one hand, tours take place with interested people who want to learn more about the history of the old fishermen. On the other hand, research trips are organized with scientists who are still trying to restore biodiversity in the Baltic Sea and, of course, to reintroduce the herring. In order to arouse even greater interest in this important research topic, there are large light installations at the reservoir that draw attention to this problem and also allow real-time transmissions from the research cutters to be experienced.

Each research group is interdisciplinary. There are engineers, marine scientists, but also artists - including a goldsmith who wants to understand about food chains. One important project was to use solar-powered temperature regulators in the Baltic Sea to cool the waters down. It took a few years, but now the release of herring will be successful. This is mainly due to a new form of cooperation in which different disciplines as well as transdisciplinary, i.e., with civil society, worked together to find solutions. Every resident of Stralsund and the surrounding areas can do project work on the ship and become part of the research group. It is easy to apply for educational leave for this purpose.

SCHOOL OF CHANGE

FACE–TO–FACE WORKSHOP, BREMERHAVEN – GROUP 3

Visualization: Gabriella Goncalles



In 2050, Bremerhaven has good mobility concepts and connections between the city and the sea. The container port and the Goethe district are also connected in different ways. Since there are no more airplanes and ships are climate-neutral, people travel for longer periods of time. Elia, a union spokeswoman, lives there. She was born in 2009 and works at the container port and, like everyone else, no more than 25 hours a week. The other time is freed up for further education and social commitment, especially to develop as a society, such as in regenerative horticulture. As a result, citizens are satisfied and self-determined.

Echo, 16 years old, also lives on Goethestraße. She is currently considering the question of which profession she should tackle first. At the monthly meeting with various people presenting their professions at the Wandelschule, Echo meets Elia on the school's "green roof." They discuss how discarded shipping containers can be used to generate energy from algae and how the students can participate. All container ships are equipped with electric motors; combustion engines have long been banned.

The modular school system brings people of different ages together. The school offers science labs as well as labs for co-creation, but also workshops on upcycling or circular economy. One can work, learn and further educate oneself, but also research and live there – in a culture of variety as well as of being creatively versatile and socially networked. The city of Bremerhaven is valued for its international relations, because the citizens are inquisitive. Every ship's crew stands for this. Furthermore, the city is based on a social and regenerative economy and all ship workers are committed to the oceans.

The visualization shows the container port, the Wandelschule (School of Change), the Goethe quarter as well as a container ship, whose containers are either deposited in the city or are in transit. They are all places of work and education, i.e. schools, research laboratories and community gardens can be found there.

ALGAE LAND

FACE–TO–FACE WORKSHOP, BERLIN – GROUP 2

Visualization: Sebastian Esposito

The scene takes place on the Soho Islands in the middle of the Atlantic Ocean. The islands will probably still belong to Portugal in 2050. Two people meet there: Georgina is an architect (40 years old) and one of the world's first known sustainability architects, and Arnold, a 48-year-old business developer and entrepreneur. As he is very successful economically, he invests in real estate and digital green business models. They hit it off right away and want to realize new living models together. Their idea is based on Zero Waste and Circular Economy approaches, meaning that only recycled materials or renewable resources will be used in their new building project. The focus is on interconnected, neighborhood-oriented living and working units floating on water.

Mass production of algae serves as an energy supply. Thus, the sea can be cleaned, food sources can be provided and energy can be produced.

On the one hand, life can be arranged individually, on the other hand, each resident:in engages in the neighborhood and lives in harmony with the environment. The natural environmental conditions are respected and the economy is based on regenerative models. Care is taken to ensure that there is no waste of energy, but that energy consumption is as low as possible. Due to climate change, the floating modules are preferred to be inhabited than corresponding housing units on land. Energy is generated with the algae, even for heating algae energy is used. In addition, Alga Land has fish aquacultures as well as algae aquacultures.

The focus is on lifelong learning. Every visitor can learn how to work with algae, what can be produced from them and how they can be used for different things. Thus, a new learning community is created, based on the generation of knowledge about algae. It has been agreed that all residents will have a good knowledge not only of the importance but also of the methods used to treat algae. Therefore, they invest 10 hours per week to learn how to innovate and develop them. There are diverse industries that deal with algae, from food, clothing, building materials, bio-plastics, etc.

Algae Land is a new model for solidarity and regenerative economy, so many people travel there to be inspired.

OCEAN FUTURE LAB – A PROJECT IN THE GERMAN SCIENCE YEAR 2022 – PARTICIPATE!

IMPULSE PAPER

INTRODUCTION

How do we want to live with the oceans? This was the core question of the Ocean Future Lab project, which kicks off as part of the German Science Year 2022 - Participate!. In the workshops, five of which were held online including a hackathon and seven in person, citizens were able to develop their visions of the future of our coasts, seas and oceans together with experts from the fields of science, art and entrepreneurship. The Ocean Future Lab is open to all interested parties; a total of 400 people have participated in the co-creation events in 2022.

In the online workshops and the workshop at the Berlin International University, ideas for tomorrow's world were discussed and probable and desirable scenarios for the year 2050 were developed. Each of the face-to-face workshops had a location-based focus: At the German Oceanographic Museum in Bremerhaven, the focus was on the "City by the Sea". At the Ozeaneum, the German Oceanographic Museum in Stralsund, the focus was on a "Maritime Museum of the Future" - with 2050 also serving as a reference year in both cases. In addition, the educational format of a "Future Box" on the topic "Oceans" was developed and tested with the Futurium Berlin. In three Open Lab evenings, interested parties were invited to use the Future Box "Oceans", which encourages reflection and discussion of various future scenarios.

An integral part of the Ocean Future Lab is transdisciplinary collaboration. For example, scientists facilitated discussions to develop desirable narratives. Six of the storyboards that were co-created in small groups during the workshops were selected and visualized by artists in different media.

As an innovative example, the Ocean Future Lab aims to provide impulses for further participatory formats on the topic of sustainability in dealing with coasts, seas and oceans.

Citizen engagement in dialogue with marine science in future decisions on the protection and use of the oceans is a focus of the International Decade of Marine Research for Sustainable Development 2021 to 2030.

More information about the project and the results are available on the project page on the Internet at

www.oceanfuturelab.de.

THE OBJECTIVE OF THIS IMPULSE PAPER

In addition to the interdisciplinary exchange of knowledge on the sustainable use of our seas and oceans, the focus of the workshops to date has been on co-creation of desirable futures. The discussions also revealed expectations and ideas for necessary measures with regard to the oceans as well as underlying value standards.

The aim of this impulse paper is to reflect and present these values and ideas that are linked to the oceans. In this way, it is intended to make visible what is important to the participants and how they value our coexistence as a society with the seas and oceans.

The following observations are not to be understood as a representative evaluation based on scientific criteria. They are an expression of subjective as well as dialogically discussed attitudes. At the same time, an insight into current models of thinking with great interest in sustainable futures of our coasts, seas and oceans opens up. This insight can serve as an exciting impulse for further discussions in public and politics.

THE RESULTS

In the online workshops, there was a choice of five topics for which the participants could develop their visions. The topics "Usage" were chosen seven times, "Handling the oceans" six times and questions about "Responsibility" four times. Concepts around the topics "Citizen of the Sea" were chosen twice and "The Sea as a Place of Regeneration" once.

Frequently, life on the water was envisioned with entire living worlds or stations that address research, technology and education in the sense of sustainability. It also involved formulating visions of the city by the sea as well as the future of marine museums in 2050.

In the scenarios, for example, artificial islands were designed, sometimes consisting of a coexistence of flexible housing units that can be disconnected at any time if desired, sometimes of a research platform with a deep-sea station and an educational mission for society, sometimes of a complete floating city in which all residents are also citizens of the sea.

The idea of a life on the sea has released a lot of creativity among the participants of the workshops. The vastness of the oceans, as a space still little inhabited by humans, obviously offers possibilities for imagining new forms of coexistence. In their ideas for the future, the participants not only addressed the issue of living with the oceans, but also the question: How will we live together in the future? In addition to the ecological and social levels, economic and technological aspects also play an important role. Thus, in the following, a distinction is made according to the categories ecology, social and economy, with the seas and oceans serving as a point of reference.

Ecology

The ideas for the future reflect the desire to live in harmony with the seas. Healthy seas and oceans, intact marine ecosystems and clean water are important prerequisites for the lasting well-being of the people who live by and on the sea - but not only for them. These aspects are far-reaching and also vital to the survival of life on land. Marine conservation is therefore a core value that must always be taken into account.

That is why education plays a very important role in the future scenarios. The sea should be made tangible in order to show the importance of the oceans for life on land as well. The basis here is the realization that one only wants to protect what one knows and appreciates. In the discussions, therefore, to convey the sustainable way of life on the ocean in the form of ecotourism, for which different ideas and approaches were raised.

Lifelong learning is a key point. Art-science projects are also purposeful, as they know how to initiate many innovations. With the help of digital platforms on marine topics, transparency and education should encourage people to change their lives on land, with the aim of better communicating scientific research findings as well as permanently protecting the oceans. Mankind depends on an intact nature.

The ecological aspect is given a very high priority by the participants. This is also confirmed by the survey questionnaire that was filled out before and after each workshop. The questionnaire also asked what was important to the participants and what their greatest concerns were. Almost all of the feedback concerned the marine environment. They mentioned, for example, the exploitation of the oceans and the deep sea, the biodiversity loss of animal and plant species, the consequences of climate change for the oceans and, as a result, for people, the large amount of waste in the waters. These concerns are also reflected in the future scenarios, combined with the effort to find solutions to steer towards a desirable future.

Economy

In addition to marine conservation as a value in its own right, the participants also discussed practical implementation. The oceans will probably continue to be used by humans in the future, with a focus on respectful and sustainable use.

In the vision of the future, advanced (bio)technology will enable life on the sea, focusing on the vision that technology uses nature without exploiting or overusing it. Ideas based on this aim for a circular economy, for example by developing a "super algae" that can be applied in many different ways. Energy is generated in a climate-friendly way, i.e. using tidal energy, hydrogen and wind power.

Applied science accordingly plays an important role in many of the proposals. It explores how coexistence with the oceans and a corresponding circular society can function and how healthy oceans can be guaranteed in the long term.

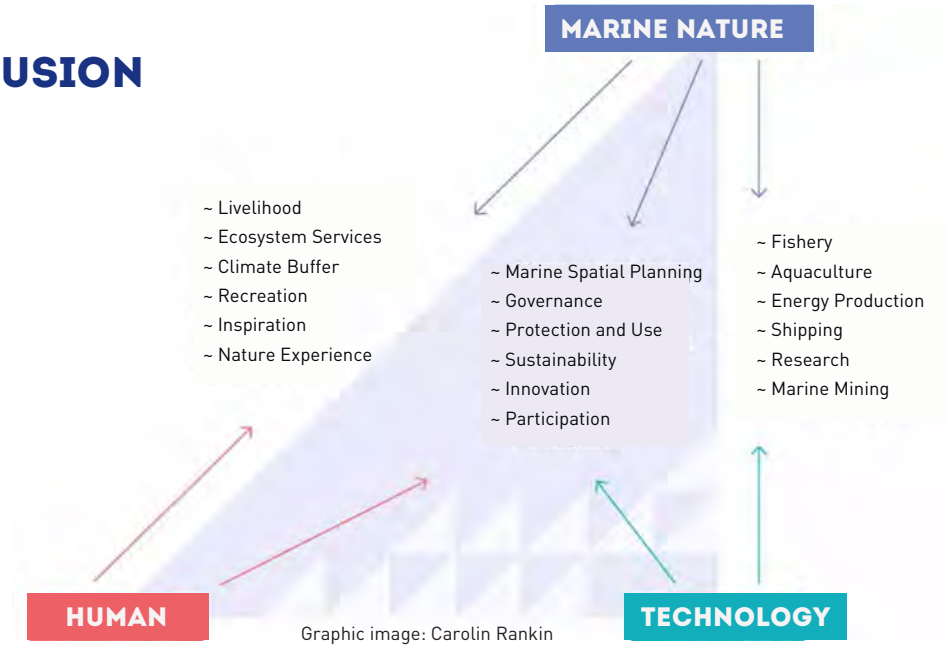
The idea is that marine living environments are pioneers for sustainable living, linking economy and nature for the benefit of both, and from which other sectors can learn.

Society

Linked to the economic ideas are notions of a self-sufficient life: Energy is locally self-generated. There are separate education systems with a lot of free time, and as much as possible is shared. Similar keywords are used here: cosmopolitan, international, peaceful, shared. There are specific rules to live on the sea, all people are welcome and there is no isolation. The idea of participation is important: everyone contributes according to their capacities and benefits from the community.

Life on the sea seems to offer inspiration for new forms of living together. Longings are reflected to break out of narrowly perceived everyday structures and to dare something new. To realize the vision of a self-defined "good life", in the sense of "everything is possible". In the case of the workshop groups, this was coupled in each case with the version of a sustainable life in harmony with nature in general and the sea in particular.

CONCLUSION



Graphic image: Carolin Rankin

There is a promise of freedom in the blue expanses of our planet - a sense that anything is possible. They reflect the desire to live in harmony with nature. All living beings are given a very high value and the seas and oceans are seen as a source of life without which we cannot survive. However, this is not to be understood as a romanticized view, as at the same time very practical thoughts are given to the use of (bio)technologies and sustainable energy sources and resources in order to establish a self-sufficient circular economy. The form of living together is also thought about, with co-living in unity with nature being valued on its own.

However, these aspects and intangible values are not the focus of marine spatial planning, which gives a lot of space to economic needs and uses such as shipping, fishing and, currently, energy production. It is true that Germany has placed 45 percent of its marine territory under protection. Nevertheless, the North Sea and the Baltic Sea are not in a good ecological condition. Even in protected areas, raw materials are extracted, for example sand for harbor or road construction. Furthermore, there is still widespread fishing in protected areas and busy shipping routes pass through the areas.

This impulse paper is an invitation not to view the oceans mainly as an economic area, but to perceive them more as a habitat that must be preserved. Healthy coasts, seas and oceans are our basis for life. This realization is not new. But it is necessary to stimulate discussions on how we can rethink and implement economic uses and marine conservation together. A start is to give more consideration to intangible aspects such as ecosystem services, climate impacts or recreational needs in planning. The participants in the workshops provided suggestions on how this can be done.

As the largest habitat on Earth, the world's oceans shape people's lives in many ways. So far, the Ocean Future Lab made it clear that, in addition to the use of resources, values such as experiencing marine nature play an essential role. All of these aspects must be incorporated into the development of protection and management concepts.

THE PARTNERS

The **German Marine Research Alliance (DAM)** was founded in 2019 by the German marine research community together with the federal government and the Northern German states. Its aim is to strengthen the sustainable management of coasts, seas and oceans through research, transfer, data management, digitisation, and coordination of infrastructures. To this end, the DAM develops solution-oriented knowledge together with its member institutions and ensures a target-group-oriented exchange of knowledge and dialogue with society.

www.allianz-meeresforschung.de

The **German Oceanographic Museum Foundation** in Stralsund is officially one of the cultural beacons in the new federal states. The museum awakens people's interest in the nature of seas and coasts. It touches, moves, and makes people sensitive, thus contributing to changing their thinking and behavior towards the natural environment.

www.deutsches-meeresmuseum.de

The **German Maritime Museum** in Bremerhaven is a research museum of the Leibniz Institute for Maritime History and a place of education and dialogue. At the core of its work are maritime issues of relevance to society as a whole.

www.dsm.museum

The Institute for Art and Innovation supports and promotes the interaction of art and innovation pushing forward social-ecological and digital transformation. It has been working in a multidisciplinary and cross-thematic way since 2017. In order to drive social innovation, a variety of co-creation and collaboration formats are applied to achieve a common good for future generations within the planetary boundaries.

www.art-innovation.org/

About the German Science Year 2022 – Participate!

The **"Science Year 2022 – Participate!"** invites all citizens to pose their own personal question for science and thus provide impulses for potential future fields and future research projects. These science years are initiatives of the Federal Ministry of Education and Research (BMBF) together with Wissenschaft im Dialog (WiD). For 22 years, these events have supported the mediation between scientific research and the public.

ABOUT THE OCEAN FUTURE LAB

The aim of the OFL is to strengthen awareness and civic engagement for the sustainable use of coasts, seas and oceans. In terms of constructive reflection, joint consideration, negotiation and knowledge transfer is promoted, so that options for scientifically sound debate and political-social and (social) economic measures become available. The close cooperation between citizens, artists, innovators, scientists as well as cultural and scientific institutions opens up design possibilities and identifies potential for joint action.

Online and face-to-face workshops, a hackathon and a science slam were organized to increase awareness and civic engagement for the sustainable use of coasts, seas and oceans. Reflecting on the complex challenges in relation to the largest ecosystem on earth, a close, transdisciplinary collaboration was initiated.

The Ocean Future Lab is characterized by the transfer of new, co-creative methods for science communication; the visualization of concrete initiatives that produce innovative solutions, materials and products; further development of ideas in the hackathon with the support of experts; visualizations of future narratives for a broader dialogue; the production of the toolbox "Oceans" as workshop material. An impulse paper offers insights into this participation format and shows options for a scientifically sound debate as well as political-social and (social) economic measures.

Foto: Anke Neumeister/Deutsches Meeresmuseum

Bundesministerium für Bildung und Forschung
DAM Deutsche Allianz Meeresforschung
Deutsches Schifffahrts Museum
Deutsches Meeresmuseum Stralsund
THE INSTITUTE FOR ART AND INNOVATION