

Background

On 17 October 2019, the European Geosciences Union (EGU) hosted '[Shaping EU Missions: bridging the gap between geoscience and policy](#),' an event held in Brussels, Belgium to facilitate dialogue between nearly 70 policymakers and geoscientists representing a wide range of sectors and fields of expertise. The goal of this meeting was to offer feedback regarding the areas that will be addressed by the four most geoscience-relevant EU [mission boards](#):

- Adapting to climate change, including societal transformation
- Healthy oceans, seas, coastal and inland waters
- Climate-neutral and smart cities
- Soil health and food

Each mission board is composed of 15 experts who are tasked with identifying a set of priorities that are ambitious, interdisciplinary, cross-sectorial and inspirational. From this, the mission boards will create [missions](#), projects with clear targets that focus on specific societal challenges.

Because the geosciences encompass a diverse spectrum of scientific disciplines, they play an important role in many areas related to the missions, including those pertaining to climate change, natural hazards, energy, agriculture, soil restoration, land-use change, inland waters and ocean health.

This event therefore provided an opportunity for geoscientists and policymakers to collectively identify potential challenges each mission board could address. This report summarises the key outcomes of the event's roundtable discussions.

Summary

During the event participants outlined three key areas they thought the mission boards could focus on to improve their final outcomes. These included:

- Clarifying how the missions will function to boost external engagement and support
- Using scientific evidence, as well as public interest, to steer the missions to ensure the most societally critical issues are addressed
- Encouraging coordination within the missions and between existing EU-funded projects to increase their effectiveness

A brief summary of the challenges and potential solutions discussed within the four mission board areas most relevant to the geosciences is outlined below.

Adapting to climate change, including societal transformation: participants focused on how climate adaptation can be integrated into a multi-hazard risk reduction strategy. This could be supported by improving the exchange of information between local, national and EU institutions.

Healthy oceans, seas, coastal and inland waters: participants highlighted the need to create a narrative that the ocean is worth saving. This could be achieved by supporting a flagship ocean-observing campaign involving citizen science and creating a "shared ocean knowledge hub". A separate discussion outlined the challenges of managing floods and reducing the resulting damage.

Climate-neutral and smart cities: participants focused on what will be needed for European cities to successfully transform their energy systems, including incentivising carbon-neutral investments, further developing smart energy grids and engaging social scientists.

Soil health and food: participants highlighted the potential for geo-information and satellite data to play a larger role in increasing the efficiency, sustainability and predictability of food production. A separate discussion outlined the issues associated with soil contamination and potential methods of improving current remediation strategies.

Overarching outcomes from the roundtable discussions

Clarifying how the missions will function to boost external engagement and support

Participants reasoned that external scientists, institutions and stakeholders will better understand how they can best contribute to the missions if the boards publicly outline how the missions will function, identify and overcome public knowledge gaps, and translate the outcomes into policy. Attendees also stated that increasing the transparency regarding how the mission boards' decisions are made could also help increase awareness about why the missions are being implemented and promote public trust. As Europe's largest geoscience organisation, the EGU is ideally positioned to support this initiative by collecting feedback regarding areas within the mission boards that the geoscience community believes require clarification.

Using scientific evidence, as well as public interest, to steer the missions to ensure the most societally critical issues are addressed

While mission boards should engage the public when defining, communicating and disseminating the missions, participants argued that the level of public interest is not always an indication of how societally relevant or imperative a particular problem is. Using scientific evidence, as well as public interest, to outline the specific challenges and missions will allow the most relevant issues to be addressed while also ensuring that the missions are not dictated by the strongest advocates. The EGU membership consists of a diverse group of scientists with a broad range of specialisations who are available to share their expertise with the boards during the process of defining specific missions.

Encouraging coordination within the missions and between existing EU-funded projects to increase their effectiveness

Ensuring there is coordination both within and across the mission boards will enable the exchange of ideas, common themes and solutions. Promoting this exchange will not only improve individual missions, argued the participants, but also support their collective success. Annual workshops that include all of the different mission board members could be one method of facilitating this coordination.

Increasing coordination between missions and existing, EU-funded projects would help minimise unnecessary duplication while still incorporating a multitude of perspectives and information, according to the event's participants. They suggested that the mission boards establish a "shared knowledge interface" platform as a method of achieving this coordination while also allowing citizens, policymakers and scientists to more effectively engage with the missions and other EU-funded research projects. A shared knowledge interface also has the potential to improve the connectivity between different EU datasets, scientific institutes, and governing bodies and sectors, thereby making information more openly available to drive bottom-up solutions.

In addition to outlining overarching issues that the mission boards could address, participants discussed specific issues relating to each mission board theme.

Adapting to climate change, including societal transformation

The discussion on *Adapting to climate change, including societal transformation* focused on how climate adaptation can be better integrated into a multi-hazard risk reduction strategy. This approach to disaster risk reduction combines separate risks within a given area and identifies the interactions that may occur between them. Such [an approach](#) provides a broad understanding of the comprehensive disaster risk, improves accuracy regarding expected losses, and enhances urban planning and emergency management.

Participants reasoned that improving the exchange of information and coordination between local, national and EU institutions and between scientific disciplines would enable climate adaptation to be more effectively integrated into a multi-hazard risk reduction strategy. To improve this exchange, the participants suggested the mission board could create a programme or select an existing institution within each member state to assist in standardisation and exchange of data pertaining to climate-related hazards. Supporting scientific organisations in hosting or scaling up events involving both scientists and policymakers (similar to the EGU's annual science-policy event) was also highlighted as something that the mission board could support to facilitate the exchange of data on a local level.

To meet the diverse range of scientific input required for a multi-hazard approach, participants suggested that scientific unions including the EGU could expand upon and share their existing lists of approved experts who are also skilled science communicators. EU institutions and mission boards could then approach these experts to gain insights into specific aspects of climate adaptation and/or natural hazards as well as to respond during emergencies.

Healthy oceans, seas, coastal and inland waters

The participants focusing on this theme outlined a number of key projects this mission board may want to focus on, including: delivering an ocean-awareness campaign that helps EU citizens understand the importance of the ocean in their daily lives and how human activity is compromising some of its fundamental

ecosystem services; launching a global study to assess the capacity of the oceans, seas, and coastal and inland waters to support a sustainable [blue economy](#); and connecting the various global, regional and local ocean governance mechanisms to become more coherent and effective.

Participants also highlighted the importance of creating a narrative that the ocean is too important to ignore and not too big to fail. The participants suggested that the mission board could address this effort by supporting more integrated and sustainable ocean-observing efforts and launching a campaign that embraces a combination of ship-based expeditions, ocean robotics, planes, small and large satellites and citizen-supported observations and science. This approach would not only engage citizens but also promote the advancement of high- and low-tech equipment and showcase the potential of excellent science for solving societal problems.

Creating a “shared ocean knowledge hub”, could also enable the mission board to promote this campaign by facilitating the exchange of information, determining existing knowledge gaps, informing policy decisions and showcasing best-practice examples from islands, coastal communities and/or cities. Participants also outlined how a knowledge hub could advance marine spatial planning approaches and inspire the invention of new tools and games to help stakeholders visualise how different policy actions could result in either a prosperous and sustainable future or lead to major crises and societal unrest. One element of this effort could be creating a 3D- or 4D- visualisation system to explore today's ocean and compare that scenario to a future ocean as simulated by models.

A separate discussion outlined the challenges of managing inland waters, specifically those relating to flooding, and the damage that extreme events can cause despite the solutions and technologies that have already been developed. Participants discussed the potential for the mission board to integrate newer technologies such as big data, cloud computing, artificial intelligence and machine learning with existing solutions. Participants also highlighted the need for the missions to promote a better understanding about how climate change could exacerbate the risks of flooding, and how local governments can ensure that they are ready for the next big flood. Finally, the attendees emphasised how important it would be for the missions to focus on fair

and intergenerational water management across Europe and to include input from scientists at all career levels in those conversations.

Climate-neutral and smart cities

The discussion on *Climate-neutral and smart cities* focused on what will be needed for European cities to successfully transform their energy systems and become climate neutral. Participants highlighted the need for the missions to help facilitate public- and private-sector investment in new, energy-efficient and climate-neutral infrastructure. They emphasised that increasing public- and private-sector investment will require the creation of an environment that encourages spending on energy-efficient and climate-neutral infrastructure over traditional varieties.

The expansion of smart energy grids was highlighted by the participants as something the EU should prioritise to encourage the growth of climate-neutral cities. Although much progress has been made with [72% of European consumers](#) expected to be connected to a smart meter by 2020, the expansion of smart meters should continue. Participants likewise emphasised the necessity of [continuing to expand](#) high-speed, high-capacity broadband networks such as 5G and ubiquitous fibre to enable micro-control of smart energy grids and support a successful energy transition.

Transforming energy systems will impact communities across Europe and will therefore require acceptance of considerable cultural and behavioural changes. During the discussion, the participants highlighted the need for the mission board to include social scientists and experts in change management to help create a public outreach strategy during this transition phase.

Next Steps

We hope that the mission boards, relevant EU Institutions and scientists find the outcomes of this report useful, and we would like to thank everyone who contributed to the discussions during the event.

The EGU believes it would be beneficial for the mission boards and assemblies to expand on some of the issues and ideas raised during this event. The Union, whose membership consists of more than 20,000 scientists working in a wide range of geoscience fields, would be happy to provide additional support and expertise to the mission boards going forward. Please send any requests, questions or feedback regarding the outcomes of the event to policy@egu.eu.

More information

The [European Geosciences Union](#) is the leading organisation for Earth, planetary and space science research in Europe. With our partner organisations worldwide, we foster fundamental geoscience research, alongside applied research that addresses key societal and environmental challenges. Our vision is to realise a sustainable and just future for humanity and for the planet. EGU's 20,000 members span many key scientific areas that can enhance the policy-making process including natural hazards, energy resources, climate change, soil science, and raw-material sourcing.

Soil health and food

The discussions on *Soil health and food* focused on both food production and soil restoration and remediation. The discussion on food production outlined the need for higher-quality food across the EU rather than a greater quantity. The participants acknowledged that quality food production is difficult to address because it is linked to a range of environmental factors such as soil health, water and climate change, which are in turn influenced by a spectrum of human activities. To deal with this complexity, participants suggested creating a meta-study for policymakers that explains the various environmental and human interactions impacting food production in Europe. The EGU could link the mission board to relevant experts to assist with such a study.

Participants also highlighted the potential for standardised geo-information and satellite data to play a larger role in identifying changes in environmental factors that impact food production. These technologies could increase the efficiency, sustainability and predictability of food production and minimise food waste.

The discussion on soil restoration and remediation outlined the issues associated with the cost, limited data or knowledge regarding contamination, and disconnect between soil science and society. Participants suggested that this mission focus on improving the knowledge exchange both between and within the scientific community and different levels of government to promote greater action on remediation, reduce future contamination and help increase awareness about the extent of the current soil contamination across Europe.