



## Societal Engagement Knowledge Exchange Nr. 2

Ocean observations and predictions in response to the climate emergency



Credits: Hannah Grist (SRSL)

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## About this document

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## Summary for publication

The second Stakeholder Engagement Knowledge Exchange event entitled “Ocean observations and predictions in response to the climate emergency” was held in Edinburgh (UK) on 16 October 2019. The event was hosted and moderated by Blue-Action, with five speakers representing partners across the consortium.

The goal of this event was to **share cutting-edge research by Blue-Action on ocean observations and model projections, and how this work can lead to robust predictions of the physical characteristics and productivity of Scottish seas up to a decade in advance.**

The audience was comprised of invited stakeholders across academia, industry, NGOs and policymaking. The structure and outcomes of this event are described in this deliverable, with references to the outputs and documentation.

**The key take-home messages** from this event form the basis of a new publicly available document published by Blue-Action to highlight the importance of ocean observations and predictions and translation to climate services to relevant sectors. With this action, Blue-Action has increased its profile in Scotland, and built a reputation as a valuable and reputable source of climate information.

## Work carried out

As part of Blue-Action's societal engagement remit, a public talk and discussion on the topic "Ocean observations and predictions in response to the climate emergency" was held on 16 October 2019. The event took place from 9:00 – 11:00am at Edinburgh City Chambers, Edinburgh (UK). The aim of the event was to undertake knowledge exchange with relevant stakeholders on the potential for climate services in Scotland arising from current research on ocean observations and seasonal to decadal predictions. Five speakers from the Blue-Action project gave short presentations, followed by a question and answer session and an open moderated discussion.

The graphic is an invitation to an event. It features a background image of a vast, flat, icy landscape under a blue sky with light clouds. In the top right corner, the 'BLUE ACTION' logo is displayed in white text on a dark blue rectangular background, with a small globe icon to the right of the word 'ACTION'. The main title, 'Ocean predictions and observations in response to the climate emergency', is written in a large, dark blue, sans-serif font in the center-right. Below the title, there is a block of text providing details: 'Date: 16th October', 'Start: 9:00am for a 9:15 start', 'End: 10:15, with networking until 10:45', and 'Location: Edinburgh City Chambers Business Centre, 253 High Street, Edinburgh, EY1 1YJ'. To the right of these details is a paragraph of text explaining the event's purpose. At the bottom left, there is a small European Union flag logo and the text 'All welcome. Refreshments provided.' and 'Please RSVP: [hannah.grist@srsi.com](mailto:hannah.grist@srsi.com)'. At the very bottom, a small line of text states: 'Blue-Action has received funding from the European Union's Horizon 2020 Research & Innovation Programme under Grant Agreement No 727852.'

Figure 1. Invitation to the event. Credits: Hannah Grist (SRSI)

Recent research show that climate models now have the skill to predict changes in the ocean and global climate and their associated impacts on our society. Blue-Action has shown that these predictions are possible on seasonal to decadal time-scales, which are relevant for businesses, policymakers and communities to plan for the future and address the impacts of the climate emergency.

This event shared **cutting-edge research** by Blue-Action researchers on **ocean observations and model projections**, and how this work can lead to **robust predictions of the physical characteristics and productivity of Scottish seas up to a decade in advance**. This was an **opportunity to for stakeholders to participate in discussions about how these findings translate into climate services, providing vital relevant information for diverse industries including conservation, fisheries and transport**.

Blue-Action organized and hosted the event, with key speakers from across the project:

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- Steffen M. Olsen, Danish Meteorological Institute (DMI), Denmark, coordinator of Blue-Action.
- Barbara Berx, Marine Scotland Science (MSS), UK, partner in Blue-Action. Barbara is also the Climate Change Lead for Marine Scotland.
- Prof. Stuart Cunningham, Scottish Association for Marine Science (SAMS), UK, who is heavily involved in the WP2 in Blue-Action.
- Prof. Noel Keenlyside, University of Bergen (UIB), Norway, WP4 lead in Blue-Action.
- Mark Payne, Technical University of Denmark (DTU Aqua), Denmark, WP5 lead in Blue-Action.



Figure 2. From left to right: Barbara Berx, Steffen M. Olsen, Stuart Cunningham, Noel Keenlyside, Mark Payne. Credits: Chiara Bearzotti (DMI).

Blue-Action coordinator Steffen M. Olsen (DMI) opened the event with a **welcome and a short introduction** to the project. Barbara Berx (MSS) then spoke on the context of **climate change in Scotland**. Stuart Cunningham (SAMS) gave a presentation on the importance of **ocean observations**, and global observing programmes. Noel Keenlyside (UIB) followed by exploring the current possibility of making **decadal predictions using climate models**. Mark Payne (DTU) finished the presentations by describing the work undertaken to translate scientific research into **climate services**.

Barbara Berx then moderated a **question and answer session** with participants. This led to an **open discussion**, with participants invited to consider and share potential climate service requirements in their sectors. Steffen Olsen concluded the event by sharing key messages, and summarising the discussions. Participants were invited to stay for a longer **networking session**.



Figure 3. Questions from the participants and open discussion. Credits: Chiara Bearzotti (DMI).

### Participants

Participants were invited from across Scotland, embodying a diverse range of stakeholder interests in the marine environment. Attendees represented a variety of sectors and organisations, from fishing organisations to nature conservation charities.

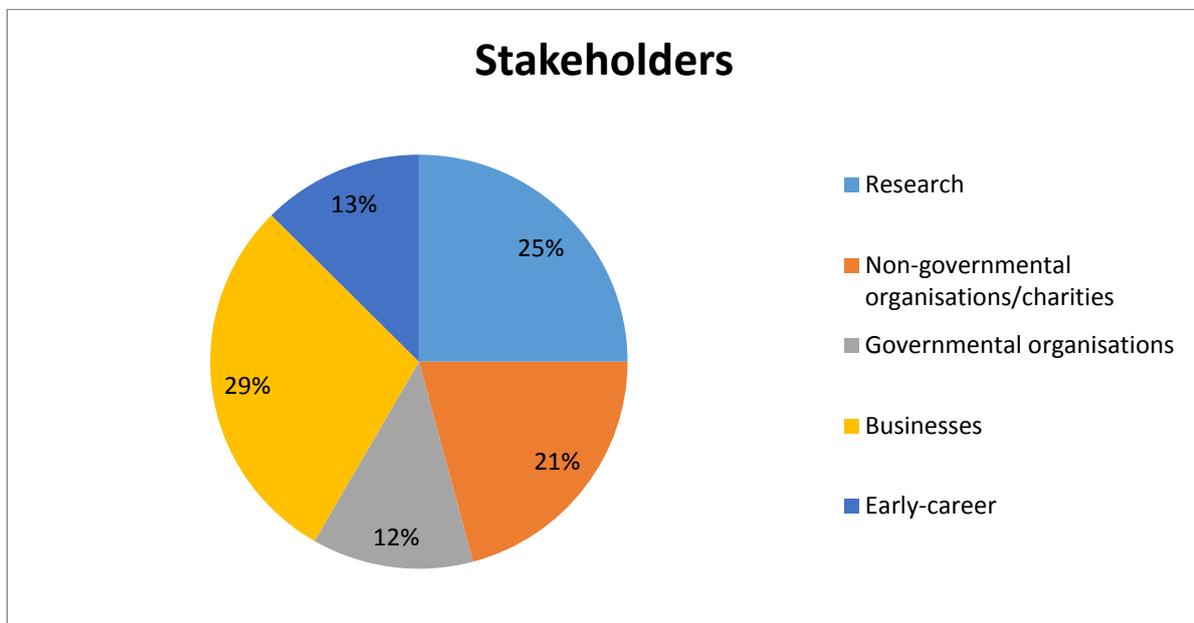


Figure 4: Graph of the sectors represented at the event.

## Main results achieved

The main **take-home messages** from the event are summarised as:

**Scotland is responding to the climate emergency, and the scientific community has tools to meet the challenge.**

- Scotland recognises the importance of the marine environment in mitigating and adapting to climate change.
- The Scottish climate change bill makes it legally binding for Scotland to reach net zero emissions by 2045. The Climate Change Plan and the Scottish Climate Change Adaptation Programme guide the mitigation and adaptation strands.
- A new virtual marine climate change centre will be established in the upcoming year to coordinate this vital research.

**A comprehensive and sustained observational network, especially for the ocean, is required to monitor, understand and predict climate.**

- Ocean observations are able to quantify the changing North Atlantic Ocean circulation and quantify its impact on climate.
- Ocean observations are central to understanding and forecasting societally relevant problems such as sea-level rise; changing climate patterns in a warming world; and ocean services such as fishing.
- Ocean observations provide new knowledge to improve our understanding of the ocean and thus improve models for ocean and climate forecasting.

**Climate predictions provide a reliable outlook on conditions in years to come in the North Atlantic.**

- Climate predictions initialised using observations of the climate of today are a powerful tool for climate adaptation efforts in some sectors and regions affected by strong natural climate variability and extremes – Fisheries is one such sector.
- Today, climate predictions demonstrate skill in the ocean whereas the expected skill over land remains to be fully realized and exploited.
- Sustained observations in the ocean are known to be crucial for reliable weather forecasts but are even more important for accurate climate predictions.

**Climate services translate these into valuable and actionable knowledge for citizens, businesses, NGOs and government.**

- Engaging private and public sectors is necessary to develop societally relevant climate services, based on these emerging climate predictions .
- Input from society (=users) is a must for co-design of climate services.

## Impact

This work has contributed to the following expected impacts of Blue-Action:

### Improve stakeholders' capacity to adapt to climate change

This event directly contributed to Blue-Action's key aim to work with diverse actors in society to exchange scientific knowledge, ultimately benefitting future climate adaptation strategies.

The discussion session at the event focused on what climate services participants would like to see, or could envisage needing in the future. An engaging debate and dialogue among speakers and participants highlighted the importance of direct contact between scientists and different sectors, a need for more workshop-style approaches that would allow co-development of ideas, and more work on research at these seasonal to decadal timescales that would allow sectors to plan for the short- to medium-term future.

### Improve the professional skills and competencies for those working and being trained to work within this subject area

In particular, we targeted Higher education students and trainees. Several early-career representatives from different sectors were invited to participate in the event to improve their knowledge and experience of the work being undertaken by projects like Blue-Action.

### Engagement with different sectors

This event was designed to be a broad introduction to the context of work being taken by Blue-Action, followed by interactive discussions where participants could share their experience and ask directed questions to improve their understanding of the impact of the research in their sector. Due to the diverse participants, this event engaged with several of our target audiences:

1. **Business stakeholders.** Blue-Action's aim is to maximise the capacity of businesses to understand and adapt to climate change. Representatives from the fishing and marine tourism industries were present, and were able to discuss and provide input on climate services.
2. **Policymakers.** Blue-Action's aim is to enable them to make improved policy decisions based on the latest scientific knowledge. This event distilled key messages of policy relevance for the attendees, which included members of bodies responsible for the management of Scotland marine resources and the convenor of the Environment Committee of the Scottish Youth Parliament.
3. **NGOs.** Blue-Action's aim is to ensure communities understand the importance and impacts of relevant climate services for their own objectives, and also to encourage two way engagement to inform the direction of the project. Several NGOs were represented at this event, enabling us to fulfil our knowledge exchange objectives with wider society.

The presentations and messages from the event were circulated to participants, with encouragement to share more widely among the community.

**Feedback from the participants:** Participants have already fed back that they shared the messages at meetings within their organisations, and have requested that future results are distributed. The messages from this event will form the basis of a new publicly available document published by Blue-Action to highlight the importance of ocean observations and predictions and translation to climate services to relevant sectors. Participants were asked for feedback after the event, and several reported an increase in their understanding and awareness of the topics discussed.

“  
I found the event  
incredibly interesting,  
more than a bit  
worrying, and certainly  
valuable.”

“  
I found the recent  
event in Edinburgh  
highly informative  
and stimulating. I  
will certainly be  
continuing to  
follow Blue-Action.”

“  
The Blue-Action Climate event  
yesterday was very informative, and  
I will be circulating [the presentations]  
around the members for discussion.”



Figure 5. Networking and one-to-one discussions after the presentations. Credits: Hannah Grist (SRSL).

## Lessons learned and links built

- Blue-Action has increased its profile in Scotland, and built a reputation as a valuable and reputable source of climate information.
- This event has allowed us to build links with a variety of organisations across different relevant sectors. All participants have requested to be kept updated with future work and events, and a briefing document will be created and circulated among the community based on the take-home messages and discussions from the event.
- Two participants have expressed an interest in becoming part of the Blue-Action Societal Engagement Group (SEG) going forward as a result of the event.

## Contribution to the top-level objectives of Blue-Action

This deliverable contributes to the achievement of the objectives and specific goals indicated in the Description of the Action, part B, Section 1.1, and in particular to Objectives 7 and 8.

**Objective 7 Fostering the capacity of key stakeholders to adapt and respond to climate change and boosting their economic growth.**

**Objective 8 Transferring knowledge to a wide range of interested key stakeholders.**

We focused this time on a regional context. Our aim was to share information and foster discussion on the potential for climate services in a specific region among participants from a range of sectors. Why Scotland? Scotland is a progressive country that has declared a climate emergency and measures to tackle the climate crisis. As indicated above, the Scottish climate change bill makes it legally binding for Scotland to reach net zero emissions by 2045. The Climate Change Plan and the Scottish Climate Change Adaptation Programme guide the mitigation and adaptation strands. Scotland stakeholders are therefore particularly receptive in welcoming inputs on how to respond to climate change.

## References (Bibliography)

Årthun, M. *et al.* (2017). Skillful prediction of northern climate provided by the ocean. *Nature Communications*, 8, 15875. <https://www.nature.com/articles/ncomms15875>

Grist, Hannah; Mettiäinen, Ilona; Ballester, Joan; Aarnes, Øivin; King, Martin; Payne, Mark; Stephen, Kathrin; Olsen, Steffen (2019). *How can we use climate predictions to adapt to the future?* <https://doi.org/10.5281/zenodo.3433776>

Hátún, H; Payne, MR; Jacobsen, JA. (2009) The North Atlantic subpolar gyre regulates the spawning distribution of blue whiting (*Micromesistius poutassou*). *Canadian Journal of Fisheries and Aquatic Sciences*, 66 (5). 759–770. <https://doi.org/10.1139/F09-037>

Lozier *et al.* (2019) A sea change in our view of overturning in the subpolar North Atlantic. *Science*, 363 (6426), 516-521. <https://doi:10.1126/science.aau6592>

Payne M.R., Hobday A.J., MacKenzie B.R., Tommasi D., Dempsey D.P., Fässler S.M.M., Haynie A.C., Ji R., Liu G., Lynch P.D., Matei D., Miesner A.K., Mills K.E., Strand K.O., Villarino E. (2017) Lessons from the first generation of marine ecological forecast products. *Frontiers in Marine Science* 4. 289. [doi: 10.3389/fmars.2017.00289](https://doi.org/10.3389/fmars.2017.00289)

## Dissemination and exploitation of Blue-Action results

### Dissemination activities

Type of dissemination activity	Name of the scientist (institution), title of the presentation, event	Place and date of the event	Type of Audience	Estimated number of persons reached	Link to Zenodo upload
Pitch event	Title “Ocean observations and predictions in response to the climate emergency”	Edinburgh (UK), 16 October 2019	Industry, Civil Society, General Public, Policy makers, Media, Customers	32	<a href="https://doi.org/10.5281/zenodo.3524032">https://doi.org/10.5281/zenodo.3524032</a> .
Social media	Wakelet on Blue-Action Stakeholder Engagement Event, Edinburgh	Edinburgh (UK), 16 October 2019	Industry, Civil Society, General Public, Policy makers, Media, Customers	It will be reported in the periodic report.	<a href="https://doi.org/10.5281/zenodo.3530732">https://doi.org/10.5281/zenodo.3530732</a>

The main output material of this event is the collection of the presentations given at the event. This collection can be found open access in Zenodo:

Olsen, Steffen; Berx, Barbara; Cunningham, Stuart; Keenlyside, Noel; Payne, Mark R (2019). *Ocean observations and predictions in response to the climate emergency*. <https://doi.org/10.5281/zenodo.3524032>.

### Uptake by the targeted audiences

As indicated in the Description of the Action, the audience for this deliverable this deliverable is the general public (PU) and is made available to the world via CORDIS.

### This is how we are going to ensure the uptake of the deliverables by the targeted audiences:

- The presentation we used at the briefing is available in Zenodo.
- This deliverable is uploaded in the Zenodo Blue-Action community in open access.
- This deliverable is going to be shared with all participants who will be encouraged to share widely among the community.
- The messages of this deliverable are going to be translated into a public-friendly briefing document to be published on the Blue-Action website and distributed at future engagement and dissemination events.