Selected baseline prediction data for impact studies

Courtesy of NASA/Kathryn Hansen

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Summary for publication

This deliverable reflects the latest status of the agreed information data flow from the WP1-4 to the case studies (CS) in WP5:

- CS1 Winter tourism centers in Northern Finland
- CS2 Temperature-related human mortality in European regions
- CS3 Extreme weather risks to maritime activities
- CS4 Climate services for marine fisheries
- CS5 Yamal 2040: Scenarios for the Russian Arctic

A request for revision for this deliverable was provided by the reviewers at the 1st EC review of the project. The deliverable has been integrated to reply to the comments of the reviewers.

Data sources

A clarification on the data baseline selected for each case study (CS) is available on the Blue-Action website in the section Climate services. These descriptions are updated on a regular basis by the CS leaders. Each CS is describing their baseline, with indication of data sources at the bottom of their descriptive page.

CS- Title	Link to the baseline documents
CS1 Winter tourism centers in Northern Finland	http://blueaction.eu/index.php?id=4140&L=198
CS2 Temperature-related human mortality in European regions	http://blueaction.eu/index.php?id=4141&L=772
CS3 Extreme weather risks to maritime activities:	http://blueaction.eu/index.php?id=4144&L=772
CS4 Climate services for marine fisheries	http://blueaction.eu/index.php?id=4145&L=0
CS5 Yamal 2040: Scenarios for the Russian Arctic	http://blueaction.eu/index.php?id=4146&L=0

Main results achieved

CS1 Winter tourism centers in Northern Finland

Based on detailed discussions with members of WP1, we have established a detailed plan for the transfer of forecast, hindcast and additional corroborative data as the next phase of CS1 development. This represents the ongoing process of interchange of ideas and expertise between these two aspects of the project. WP1 have undertaken to provide CS1 with ensembles of time series representing temperature, humidity and wind speed, meteorological data, as well as the expertise which will help CS1 to pre-process and reduce the dimensionality of the data. This expertise will be provided in the form of sample scripts as a means of allowing flexibility in the approaches of CS1. This will allow CS1 to develop a trial form of the proposed climate service which is needed for the next phase of the co-design process with the end-user Ruka.

The climate service that is co-designed in CS1 will be a flexible and interactive interface between climate modellers and winter tourism industry. This interface consists of software, working practices and methods of communication. With the inputs provided by WP1, CS1 will be able to use that data to not only produce a

tailored climate service for RUKA, but to also allow RUKA to assess how beneficial – or not – that information actually is for them hence providing information that is currently not available, and in the process, advancing the state of the art. The climate service serves as a tool that reduces uncertainty on weather and climate on seasonal to decadal perspective. This helps with planning business operations and longer-term investments, which can lead to monetary savings from e.g. energy consumption in snowmaking and salaries from optimized workload as well as contribute to climate mitigation by helping to time snowmaking to optimal conditions that require less electricity.

CS2 Temperature-related human mortality in European regions

Several interviews and online meetings have been conducted with relevant scientists, stakeholders and decision makers from world leading international institutions. A major point highlighted by many of these stakeholders is the need for reliable forecasts, therefore favoring the view of using forecasts at lead times of up to 7 days.

ISGlobal has discussed possible ways of collaboration in order to coordinate current initiatives and explore potential synergies. We concluded that the next generation of heat action plans should include high-resolution climate and mortality information to derive early warning systems for European cities, which should include the exacerbation effect of the urban heat island within the context of global warming and increasing urban populations. In addition, subseasonal to seasonal climate forecasts are currently not used for heat-health action plans, given that it is generally believed within the public health community that there is no skill beyond the weather scale, and therefore there would a window of opportunity for the generation of new products and services if there were significant improvements in climate forecasting.

CS3 Extreme weather risks to maritime activities

The focus of our work has been to identify possible use cases, and to assess business value. The continued work, i.e. deliverables of WP5 relate to/ depend on and deliverables from WP1 model implementation, and WP4 qualification and transfer.

Ongoing work at DNV GL:

- Workshops on needs assessment, identification of use cases
- Collaboration with H2020 project INTAROS
- Data screening on applicable and feasible supporting sources
- Contacts in Japan, NiPR
- Clarifications on impact of polar lows on maritime activities
- Risks identification: Sea ice, low temperatures, darkness, remoteness, marine icing, visibility, polar lows.

CS4 Climate services for marine fisheries

This deliverable is related to the transfer of data i.e. output from decadal prediction experiments to WP5 partners. Results based on data analysis are described in forthcoming WP5 deliverables.

While assessing predictive skill of physical oceanic quantities is extensively discussed in the literature since more than a decade, assessing predictive skill of abundance and distribution of marine species has become a focus of research only very recently. WP5/CS4 partners, based on the transferred data, shall tackle the latter issue.

CS5 Yamal 2040: Scenarios for the Russian Arctic

Three workshops were conducted in 2017 and 2018 where three Yamal 2040 scenarios were developed together with stakeholders including Blue-Action climate scientists.

- Yamal 2040: Scenario "Snow Queen"
- Yamal 2040: Scenario "Gas Boom"
- Yamal 2040: Scenario "Reinventing itself"

The full description of the scenarios is available in deliverable D5.22: Environment scanning workshop and report Nr. 2 Link: https://zenodo.org/record/3341291

Additionally, strategic policy options for three stakeholder groups were elaborated. The strategic potions will be available in the final report.

Within the CS5, significant progress has been achieved beyond the state of the art. The necessity for linking science to stakeholders and policy has been a matter of debate and urgency for a long time already. To approach this issue with the help of a rigid methodological approach (foresight analysis and scenario building) and bringing together climate scientists and stakeholders over an extended timeframe and through iterated meetings, is a rather novel approach. No similar research has been done before on the empirical basis of the Yamal region or any other region of the Arctic Russia and no scenarios have existed that integrate perspectives from different scientific disciplines and knowledge of stakeholders.

Impacts

The work done so far represents the basis for the development of the case studies and thus helps the project in achieving the following socio-economic impacts:

- Improve stakeholders' capacity to adapt to climate change,
- Contribute to better servicing the economic sectors that rely on improved forecasting capacity (e.g. shipping, mining),
- Improve the professional skills and competences for those working and being trained to work within this subject area,
- Improving innovation capacity and the integration of new knowledge,
- Strengthening the competitiveness and growth of companies by developing innovations meeting the needs of European and global markets; and, where relevant, by delivering such innovations to the markets.

Lessons learned and Links built

- The decadal prediction experiments were performed within FP7 project SPECS and the German project MiKlip. Forthcoming decadal prediction experiments, which provide a possible database for WP5 as well, will not only be performed within Blue-Action project, but also by other global coupled modelling centers as a part of the upcoming coordinated CMIP6 DCPP efforts.
- Synergies are sought with current and previous projects focusing on climate services such as FP7 EUPORIAS, H2020 Climateurope project through collaboration with GERICS in Hamburg and the H2020 MARCO project through collaboration with Climate-KIC France.
- Synergies are sought also with the Climate Services Partnership http://www.climate-services.org whose coordination is also based at GERICS.
- Synergies with Climateurope (GERICS): Representative of GERICS (Lola Kotova) took part in the scenario workshops of the CS5.
- It is fundamental to have a regular exchange between all the CS and WP8 to foster exploitation in the environment regulated by our consortium and grant agreement.

Contribution to the top level objectives of Blue-Action

This deliverable contributes to the achievement of the following objectives and specific goals indicated in the Description of the Action:

- **Objective 7 Fostering the capacity of key stakeholders to adapt and respond to climate change and boosting their economic growth**, by offering better services for the specific stakeholders in the case studies and providing them with improved tools.
- **Objective 8 Transferring knowledge to a wide range of interested key stakeholders,** through targeted workshops organized with the end-users in the case studies and one-to-one interviews for mapping what knowledge is available and where gaps are to be filled with new knowledge and better servicing.