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Challenges for developing national climate services – Poland and Norway

Zbigniew W. Kundzewicz[a,b,*], Eirik J. Førland[c], Mikołaj Piniewski[d,b]

[a] Institute of Agricultural and Forest Environment of the Polish Academy of Sciences, Poznan, Poland
[b] Potsdam Institute for Climate Impact Research, Potsdam, Germany
[c] Norwegian Meteorological Institute, Oslo, Norway
[d] Warsaw University of Life Sciences (SGGW), Warsaw, Poland

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ABSTRACT

This contribution discusses the challenges for developing national climate services in two countries with high fossil fuel production – Poland (coal) and Norway (oil and gas). Both countries, Poland and Norway, have highly developed weather services, but largely differ on climate services. Since empirical and dynamical downscaling of climate models started in Norway over 20 years ago and meteorological and hydrological institutions in Oslo and Bergen have been collaborating on tailoring and disseminating downscaled climate projections to the Norwegian society, climate services are now well developed in Norway. The Norwegian Centre for Climate Services (NCCS) was established in 2011. In contrast, climate services in Poland, in the international understanding, do not exist. Actually, Poland is not an exception, as compared to other Central and Eastern European countries, many of which neither have their national climate services, nor are really interested in European climate services disseminated via common EU initiatives. It is worth posing a question – can Poland learn from Norway as regards climate services? This contribution is based on results of the CHASE-PL (Climate change impact assessment for selected sectors in Poland) project, carried out in the framework of the Polish – Norwegian Research Programme. The information generated within the Polish-Norwegian CHASE-PL project that is being broadly disseminated in Poland can be considered as a substitute for information delivered in other countries by climate services.

Practical Implications

This contribution, based on results of the Polish-Norwegian CHASE-PL (Climate change impact assessment for selected sectors in Poland) project, discusses the challenges for developing national climate services in Poland and Norway. Even if these countries are giants of fossil fuel production (coal in Poland, oil and gas in Norway), their attitudes to climate services are largely different. Well-developed climate services exist in Norway, while in Poland they are non-existent. In fact, there is no Polish equivalent for the term “climate services”.

Actually, Poland is not an exception in the region. Many other Central and Eastern European countries neither have their national climate services, nor are interested in relevant EU initiatives. In Poland, the “inconvenient truth” about the anthropogenic climate change is very inconvenient. Poland is neither a member nor a cooperating state of the European Centre for Medium-Range Weather Forecasts (ECMWF). Likewise, it is not a member of the EU’s JPI (Joint Programming Initiative) Climate.

Availability of information on climate change, both observed and projected for the future is essential for building climate change awareness among Poles. Yet, there is no way for an interested citizen to learn about climate change by an easy access to a long time series of historical data from Poland.

There could be potential interest in climate projections in several sectors in Poland. Seasonal or sub-seasonal forecast of a heat wave or of a cold wave could help health and communal services be prepared. In Poland, cold wave in winter is still a major killer – even in the warming climate. Indeed, people (often – homeless and/or abusing alcohol) freeze to death. The number of fatalities due to hypothermia in Poland, in 2009 and 2010, respectively, was 238 and 333. Heat waves, that occur more frequently with the warming, cause increase in mortality (e.g. over a thousand additional deaths in 10 large towns in Poland, related to heat waves in 1994). Climate information could be used in health sector, building industry, agriculture and forestry, flood risk reduction, as well as water and sewage sector. Foresters are now planting forests to be

* Corresponding author at: Institute of Agricultural and Forest Environment of the Polish Academy of Sciences, Poznan, Poland.
E-mail addresses: zbyszek@pik-potsdam.de (Z.W. Kundzewicz), eirikjf@met.no (E.J. Førland), M.Piniewski@levis.sggw.pl (M. Piniewski).

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harvested in the second half of the 21st century – a common horizon of climate modelling.

In contrast to Poland, climate services in Norway have been vigorously developing. The Norwegian Centre for Climate Services (NCCS) was established in 2011 with the main mission to provide the society with information relevant to climate change adaptation. Among the products of the NCCS are comprehensive datasets, design values for present and future climate, climate assessment reports, "climate profiles" for counties, "tailoring" of climate products, user interfaces: phone service, meetings, as well as the web portal www.klimaservicesenter.no, etc. Downscaled climate projections are tailored and disseminated, on a regular basis, to the Norwegian society. The Centre recommends a 20–40% increase in design rainfall values towards the end of this century. The NCCS addresses their activity to various users' categories, including governmental institutions and authorities at various levels, from national to municipality, as well as stakeholders in the area of roads, railways, coastal infrastructure etc.; sectors/industries, e.g.: energy, buildings, health, primary industries; and climate impact and adaptation research community. All general NCCS's services are free of charge for the users.

Indeed, an organized collaboration between climatologists and impact scientists, perhaps modelled on the Norwegian example, could be an idea for disseminating information for climate adaptation in Poland. In a way, results of the CHASE-PL project, carried out in 2014–2017 under the framework of the Polish – Norwegian Research Programme, can be regarded as a useful initiative *in lieu* of climate services that do not exist in Poland.

The deliverables of this project include a geoportal as well as a book with information on climate change and its impacts on selected sectors in Poland, published in two language versions, English and Polish. The Polish version of the book is available for free on internet. In addition, results of the CHASE-PL project have found their way to several publications in peer reviewed, scientific, periodicals of international standing.

The CHASE-PL project reviewed change detection in observed temperature, precipitation, and snow cover in Poland. Observed impacts of heat waves on human mortality in large Polish towns were also examined. Climate projections for the territory of Poland were produced via downscaling of EURO-CORDEX-based results of climate models. Future climate changes (temperature, precipitation and snow cover) for two future time horizons and for two Representative Concentration Pathways (RCP) were examined. Based on climatic projections, large-scale impacts on water resources, biota, and agrosystems in the basins of two main rivers, the Vistula and the Odra (covering 88% of the area of Poland) were examined. This was a large and pioneering task, since model-based analysis for the whole river basins of the Vistula and the Odra (including areas in neighbor countries) had not been conducted in Poland before. This was achieved via multi-site calibration and validation of the hydrological SWAT (Soil & Water Assessment Tool) model, identification of in-stream and riparian ecosystems water needs, and scenario-based analysis of impact on ecosystems (in-stream ecosystems and wetlands) and agricultural production. In addition, meso-scale models for two medium-sized lowland catchments were used for sediment and nutrient load assessments and projections.

The CHASE-PL project linked strengths of both participating countries, exemplified by Norway's traditions and achievements in climate science and Poland's experience in climate impact science. Norwegian experts provided common climatic foundations by producing downscaled projections, while Polish experts took the lead in impact analysis.

It is trusted that results of the CHASE-PL project contribute, in a considerable way, to increase of understanding of climate change impacts in selected sectors in Poland. They extend the state-of-the-art of the detection of change, as well as projection of climate change and its impacts, and interpretation of uncertainty. The CHASE-PL project contributed to reduction of the information gap on climate change impacts among the policy-makers, stakeholders and the broad Polish society.

It is worth posing a question – can Poland learn from Norway as regards climate services? The authors of this paper are rather pessimistic here. Nevertheless, since Poland has neither a platform nor instruments for dialogue between climatologists and users of climate information, a project like CHASE-PL could indeed play a role and enhance a welcome change. The information generated within the CHASE-PL project can be considered as a substitute for products delivered in other countries by climate services. However, the CHASE-PL project lasted 40 months only, hence after its end in April 2017, provision of updated information is discontinued. It seems that the emergence of a full-fledged Polish climate services centre is not in sight yet.

1. Introduction

Despite the progress towards improved climate projections, in many countries decision makers and stakeholders are not yet fully benefiting from effective climate services in support of decision-making in climate sensitive sectors (Lúcio and Grasso, 2016), cf. Climate Services for Decision-making (brochure):http://www.gfcs-climate.org/sites/default/files/GFCS_3-fold_flyer_July2014_EN.pdf. There are limited institutional capacities and absence of effective user interfaces providing platforms for dialogue between scientists and stakeholders. In order to improve the situation, the Global Framework for Climate Services (GFCS), cf. www.gfcs-climate.org, was launched by the World Meteorological Organization (WMO) in 2009, with the aim to guide the development and application of science-based climate information and services in support of decision-making in climate sensitive sectors. The following five critical components were identified (Lúcio and Grasso, 2016): User Interface Platform; Climate Services Information System; Observations and Monitoring; Research, Modelling and Prediction; and Capacity Development.

The concept of national climate services nicely complements the mandate of the Intergovernmental Panel on Climate Change (IPCC) - a large-scale quasi-climate-service. The mandate of the IPCC is to provide policy makers with an objective assessment of the scientific, technical and socio-economic information available about climate change, its impacts and possible response options (adaptation and mitigation), via its assessment reports.

An interesting example of continental-scale information which can be used for large-scale impact assessment important for the development of adaptation strategies in European countries was provided by Van Vliet et al. (2015). They delivered a kind of climate information service for pan-European water use sectors that are vulnerable to climate change impacts, such as water management, disaster risk reduction, agriculture, energy (hydropower and cooling water use for thermoelectric power) and environment (water quality). They capitalized on robust patterns of projected future change. Their results corroborate the established knowledge on a distinct north–south divide in water projections across the continent. In the warming climate, the availability of water resources is projected to decrease in the south and to increase in the north. Hydrological extremes – floods and droughts – are