Tasks and Capabilities of NMHSs concerning Climate

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Climate Expert Team

Climate
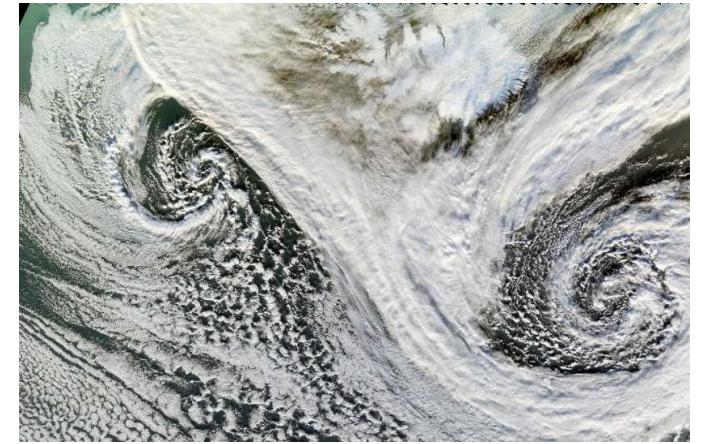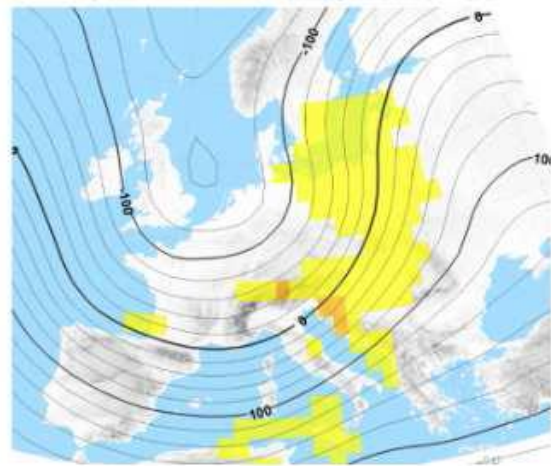
Includes:

- meteorological atmospheric parameters (e.g. Temperature, humidity precipitation, radiation, atmospheric circulation, weather patterns,...)

- cryosphere (e.g. glacier, permafrost)

- phenology

- agrometeorology (phenology, water balance, soil temperature...)

- urban climate

- sea level

- oceans

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Monitoring and Documenting of past and current climate

- Climate measurements:

    A multitude of climate parameters are measured by the NMHSs regularly for a number of years. The attempt do make climate measurements as consistent as possible and the long duration of many of the time series enable among others the investigation of past climate variability, interaction between different aspects of the climate system, …

- Data rescue, archiving:

    A lot of data is available for immediate use for climate research, but there are still a number of hidden treasures in the archives of the NMHSs that might help to prolong the knowledge about climate further back to the past in some regions or help in getting a clearer picture.

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- <u>Homogenisation of station data:</u>

  Only a very limited number or stations has measured for a long time period without suffering of some relocation or changed surrounding. Additionally measuring instruments exchanged over time (e.g. manual observation – automatic observation). Therefore no climate station is without any non-climatic influence. Homogenisation tries to reduce the errors caused by that.

- <u>Spatial and temporal analyses</u> of meteorological parameter for climate purposes on national/transnational scale:

  Measurements at a single station represent the climatic situation at the station and a limited area in the surrounding. But a number of applications need uniformly distributed information over a larger region. Analyses offer this ability, usually taking into account the topography of the area.

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- Climate indices, trends, climate variability, climate development:

	Climate can be described in different ways according to the needs of users. Climate indices give the amount of days with defined characteristics; climate variability and trends are important to describe the development of climate

- Assessing extreme events and their impacts (precipitation, droughts,…)

	Extreme weather events can not only influence climate statistics but climate influences the definition of extreme events as well. Moreover extreme events can have a hugh impact on well being, health and economy.

- Climate normal

	Climate normal are the most common description of a climate situation, giving the mean situation in 30 years.

Envisage climate change and future climate

- Developing/running climate models and downscaling of climate model results:

   Climate models are the only tool in assessing climate future. To have reliable up-to-date models delivering realistic output is essential. To improve the resolution of the model output it is downscaled using higher resolved climate models (e.g. regional climate models) or observational datasets.

- Evaluating/Analysing/Interpreting climate model results

   Additionally evaluation of the model results for the past/present is an important point. For this high quality and high resolution gridded observation dataset are needed . Moreover the knowledge on how to interpret and therefore analyse the model output is essentially to obtain best-possible information.

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- <u>Uncertainties:</u>

   As no model is perfect uncertainty is an important part of the results when using climate models. To find a good way to communicate those uncertainties is not an easy task.

- <u>Impact and Vulnerability:</u>

   Changes in climate can effect well-being, economy and environment. Chances and threads by climate change have to be assessed in order prepare. This is in most cases done together with partners of the according area.

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Information for decision makers and public

On

- current and possible future climate situation
- Causes of climate change
- Influence of human behaviour
- Basic climate knowledge

Via:

Webpage/newsletters/factsheets/interview/presentations/lectures…

(for examples see tables at the end of the presentation)
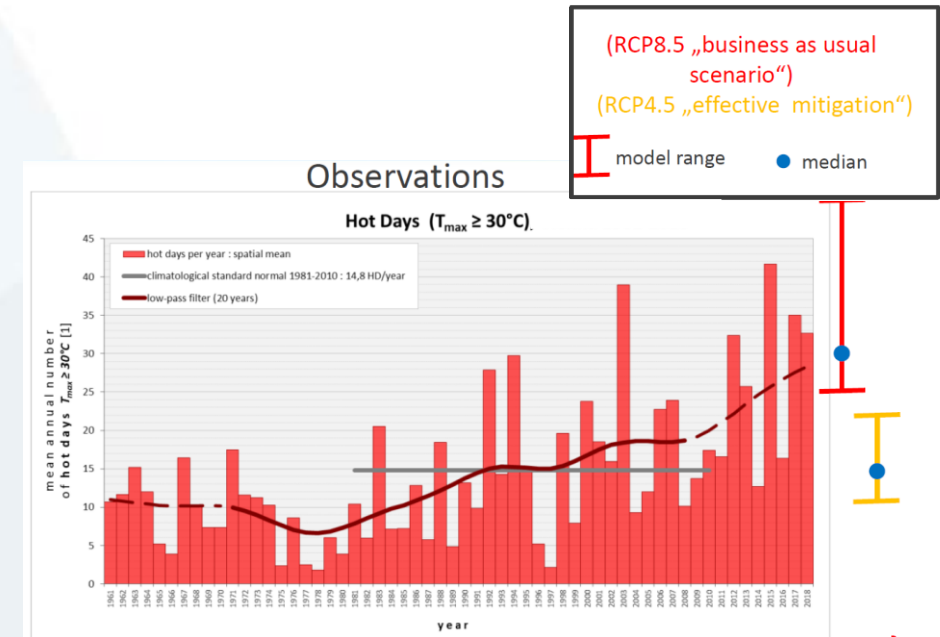
Support to companies (private and national)

e.g. in the areas of

Energy, Agriculture, Health, Water management, Civil protection, Civil Engineering , Tourism, urban planning,…
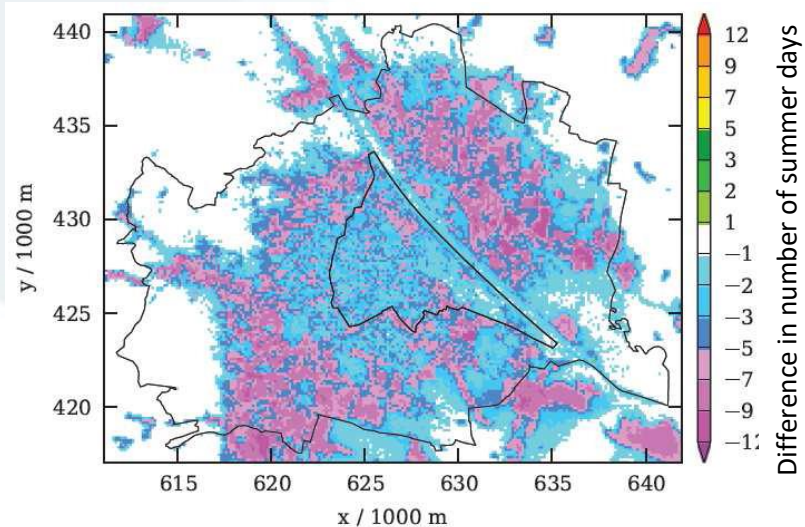
What are the advantages of products from the national weather services?

- Best informed about stations

- Most data and metadata available

- Most experience with the specific characteristics of the local climate => using improved methods best suited for their circumstances e.g. in spatial analysis and modelling

- Additional parameters to public databases

- Most number of available stations

- Additional parameters and higher temporal resolution of climate model output

- Close contact and knowledge of national/regional stakeholders/users

- Tailored information and service

What are the advantages of transnational products?

- Consistent data across borders

- Investigation of large scale structures/phenomena

- Larger ensemble of climate models

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Topics with increasing attention of NMHSs

- Exploitation and integration of several climate data sources (surface observations, satellite, models...)

- Improve climate communication

- Integrated multi-risk assessment

- Climate services

General information

The slides gave an overview on different tasks and capabilities of European NMHSs. Nevertheless, national differences between their tasks and focuses exists. This is partly the case due to their geographical location (mountainous area – sea side). Moreover the their legal setup and differences in national budgets define different responsibilities and restraints.

Differences can e.g. concern their involvement in the development of climate models or their connection to hydrological services.

Selection of online available climate information (data, monitoring,…)

Austria	ZAMG	https://www.zamg.ac.at/cms/de/klima/klima-aktuell/ https://www.zamg.ac.at/cms/de/klima/klimauebersichten http://www.zamg.ac.at/histalp/ https://www.zamg.ac.at/cms/de/klima/klimaforschung/datensaetze
Belgien	RMI	https://www.meteo.be/nl/klimaat/klimatologisch-overzicht/2019/novembre
Croatia	DHMZ	https://meteo.hr/index_en.php look for "Climate" section
Cyprus	CYMET	http://www.moa.gov.cy/moa/ms/ms.nsf/DMLclimatological_en/DMLclimatological_en?OpenDocument http://www.moa.gov.cy/moa/ms/ms.nsf/DMLseasonalforecasting_en/DMLseasonalforecasting_en?OpenDocument
Czech Republic	CHMI	http://portal.chmi.cz/historicka-data/pocasi/zakladni-informace http://portal.chmi.cz/aktualni-situace/sucho
Denmark	DMI	https://www.dmi.dk/vejrarkiv/maaneden-saesonen-og-aarets-vejr/
Germany	DWD	https://www.dwd.de/EN/climate_environment/climateenvironment_node.html https://www.dwd.de/EN/ourservices/zeitreihen/zeitreihen.html www.dwd.de/ref-ensemble https://www.dwd.de/EN/ourservices/seasonals_forecasts/start.html www.dwd.de/nationalclimatereport https://www.dwd.de/EN/climate_environment/climateatlas/climateatlas_node.html
Estonia	ESTEA	http://www.ilmateenistus.ee/kliima/kliimanormid/ohutemperatuur/?lang=en http://www.ilmateenistus.ee/professional-know-how/publications/yearbooks/?lang=en http://www.ilmateenistus.ee/kliima/ulevaated/
Finland	FMI	https://en.ilmatieteenlaitos.fi/press-release-archive
France	Météo-France	https://donneespubliques.meteofrance.fr/?fond=rubrique&id_rubrique=29 http://www.drias-climat.fr/
Hungary	OMSZ	https://www.met.hu/eghajlat/magyarorszag_eghajlata/eghajlati_visszatekinto/ English: https://www.met.hu/en/eghajlat/ https://www.met.hu/en/eghajlat/magyarorszag_eghajlata/

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Selection of online available climate information (data, monitoring,…)

Ireland	Met Éireann	https://www.met.ie/climate/available-data/historical-data Climate' tab at https://www.met.ie/
Latvia	LEGMC	https://www.meteo.lv/lapas/noverojumi/meteorologija/meteorologija_ievads?id=1121&nid=458 http://www2.meteo.lv/klimatariks/ https://www.meteo.lv/lapas/laika-apstakli/klimatiska-informacija/laika-apstaklu-raksturojums/si-gada-laika-apstakli/?nid=1181
Poland	IMGW	http://klimat.pogodynka.pl/en/climate-maps/#Mean_Temperature/Monthly/2010/1/Winter https://dane.imgw.pl/ http://klimat.pogodynka.pl/en/solar-atlas/#sis/Monthly/1991/1/02/Monthly_mean/
Luxemburg	MeteoLux	https://www.meteolux.lu/de/klima/ https://www.meteolux.lu/fr/climat/?lang=fr https://www.meteolux.lu/de/produkte-und-dienstleistungen/klimabilanzen https://www.meteolux.lu/fr/produits-et-services/bilans-climatologiques/?lang=fr https://data.public.lu/en/organizations/meteolux
Malta	Malta Airport Metoffice	https://www.maltairport.com/weather/weather-news/
Netherlands	KNMI	https://www.knmi.nl/nederland-nu/klimatologie https://data.knmi.nl/datasets http://climexp.knmi.nl/selectdailyfield2.cgi?id=someone@somewhere
Republic North Macedonia	UHMR	https://uhmr.gov.mk
Norway	MET Norway	klimaservicesenter.no/observations https://www.met.no/vaer-og-klima/klima-siste-150-ar
Portugal	IPMA	http://www.ipma.pt/en/oclima/monitorizacao/ http://www.ipma.pt/en/oclima/observatorio.secas/ http://www.ipma.pt/pt/publicacoes/boletins.jsp?cmbDep=cli&cmbTema=pcl&idDep=cli&idTema=pcl&curAno=-1 http://www.ipma.pt/en/agrometeorologia/info-diaria/ http://portaldoclima.pt/en/
Serbia	RHMSS	http://www.hidmet.gov.rs/eng/meteorologija/klimatologija_produkti.php
Slovak Republic	SHMU	http://www.shmu.sk/en/?page=1&id=klimat_operativneudaje1

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Selection of online available climate information (data, monitoring,…)

Spain	AEMET	http://www.aemet.es/en/serviciosclimaticos
Sweden	SMHI	https://www.smhi.se/klimat/klimatet-da-och-nu/klimatindikatorer English: https://www.smhi.se/en/climate/climate-indicators/climate-indicators-1.91461 https://www.smhi.se/data/utforskaren-oppna-data/
Switzerland	MeteoSwiss	https://www.meteoswiss.admin.ch/home/climate/swiss-climate-in-detail/climate-indicators.html https://www.meteoswiss.admin.ch/home/climate/swiss-climate-in-detail/extreme-value-analyses.html https://www.meteoswiss.admin.ch/services-and-publications/applications.html#order=RELEVANCE&page=1&pageGroup=application&topic=climate
UK	Met Office	https://www.metoffice.gov.uk/research/climate/maps-and-data https://www.metoffice.gov.uk/research/climate/climate-monitoring/index https://www.metoffice.gov.uk/hadobs/
Romania	NMAR	Agrometeorological online products: -Agrometeorological forecast which includes the monitoring of agrometeorological parameters and Romanian main crops phenological information, updated daily. http://www.meteoromania.ro/Upload-Produse/agro/buletinagro.pdf -Soil moisture reserve monitoring on main Romanian crops (winter wheat and maize) updated daily http://www.meteoromania.ro/Upload-Produse/agro/rezervaapa.pdf http://www.meteoromania.ro/clima/monitorizare-climatica/

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Selection of online available climate background information (texts)

Austria	ZAMG	https://www.zamg.ac.at/cms/de/klima/informationsportal-klimawandel
Belgium	RMI	https://www.meteo.be/nl/klimaat/waargenomen-klimatologische-trends/te-ukkel/luchttemperatuur/gemiddelde/jaarlijks https://www.meteo.be/nl/klimaat/de-klimaatvooruitzichten-voor-2100
Germany	DWD	https://www.dwd.de/EN/climate_environment/climateenvironment_node.html
Croatia	DHMZ	https://meteo.hr/index_en.php, look for "Climate" section. https://meteo.hr/proizvodi.php?section=publikacije&param=publikacije_publikacije_dhmz, some publication have croatian and english versions.
Cyprus	CYMET	http://www.moa.gov.cy/moa/ms/ms.nsf/DMLcyclimate_en/DMLcyclimate_en?OpenDocument
Czech Republic	CHMI	http://portal.chmi.cz/historicka-data/pocasi/zmena-klimatu/zakladni-informace
Denmark	DMI	https://www.dmi.dk/klima/
France	Météo-France	http://www.meteofrance.fr/climat-passe-et-futur/climathd
Hungary	OMSZ	English: Climate modelling: https://www.met.hu/en/omsz/tevekenysegek/klimamodellezes/
Ireland	Met Éireann	'Climate' tab at https://www.met.ie/
Latvia	LEGMC	https://www.meteo.lv/lapas/laika-apstakli/klimatiska-informacija/latvijas-klimats/latvijas-klimats?id=1199&nid=562
Netherlands	KNMI	https://www.knmi.nl/kennis-en-datacentrum/dossier/klimaatverandering-54c648d1-38d4-439c-a9cf-4ed9ded7af0d https://www.knmi.nl/kennis-en-datacentrum/uitleg/klimaatscenario-s http://www.klimaatscenarios.nl/

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Selection of online available climate background information (texts)

Poland	IMGW	http://klimat.pogodynka.pl/en/biuletyn-monitoring/
Portugal	IPMA	http://www.ipma.pt/en/publicacoes/clima/index.jsp?page=atlas.clima.xml http://www.ipma.pt/en/enciclopedia/clima/index.html
Slovak Republic	SHMU	http://www.shmu.sk/sk/?page=2049
Slovenia	ARSO	http://meteo.arso.gov.si/met/sl/climate/change/
Switzerland	MeteoSwiss	https://www.meteoswiss.admin.ch/home/climate/the-climate-of-switzerland.html https://www.nccs.admin.ch/nccs/en/home/climate-change-and-impacts/swiss-climate-change-scenarios.html https://www.nccs.admin.ch/nccs/en/home.html
UK	Met Office	https://www.metoffice.gov.uk/weather/learn-about/climate-and-climate-change/index https://www.metoffice.gov.uk/research/approach/collaboration/ukcp/index
Romania	NMAR	http://www.meteoromania.ro/despre-noi/raport-anual/

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Any Questions?

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