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Climate services communication & user engagement: A tool to anticipate climate change

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Earth Sciences Department, Earth System Services Group



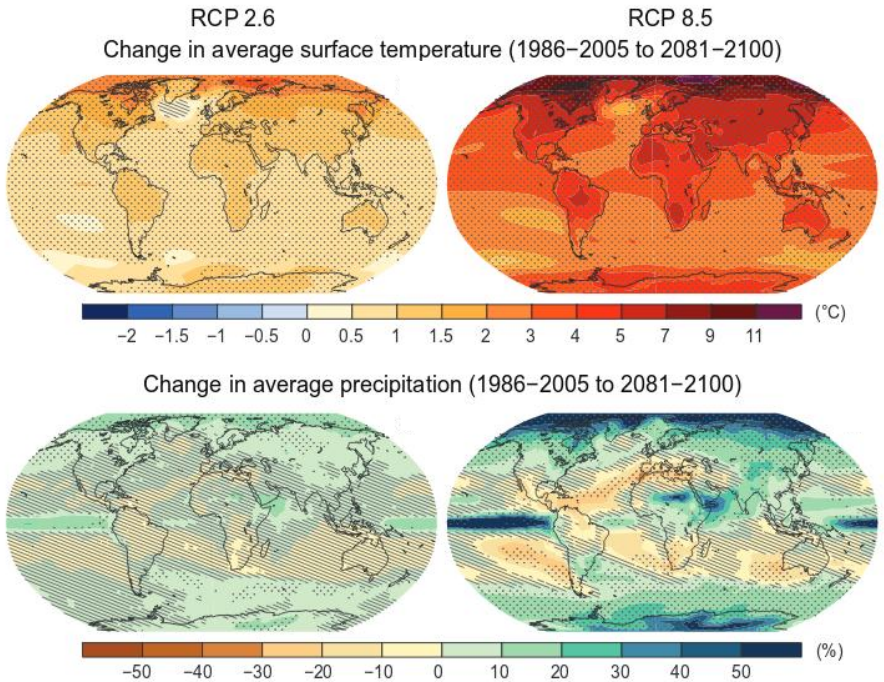

Outline

- **Introduction**
  Importance to adapt to medium-range climate change
- **Climate services**
- **Importance of communication for climate services**
- **Climate service "success stories"**
  - Climate service for agriculture – the SECTEUR project
  - Climate service for energy – Project Ukko
  - Climate service for insurance – Seasonal hurricane predictions
- **Conclusions**

Climate change

Observed changes in climate, especially warming trends, are considered to be **more apparent and severe at the end of the century**

BUT… **climate is already changing** and medium-range adaptation is unavoidable & an immediate priority across many sectors



Source: IPCC 2013

Temporal horizons of climate science

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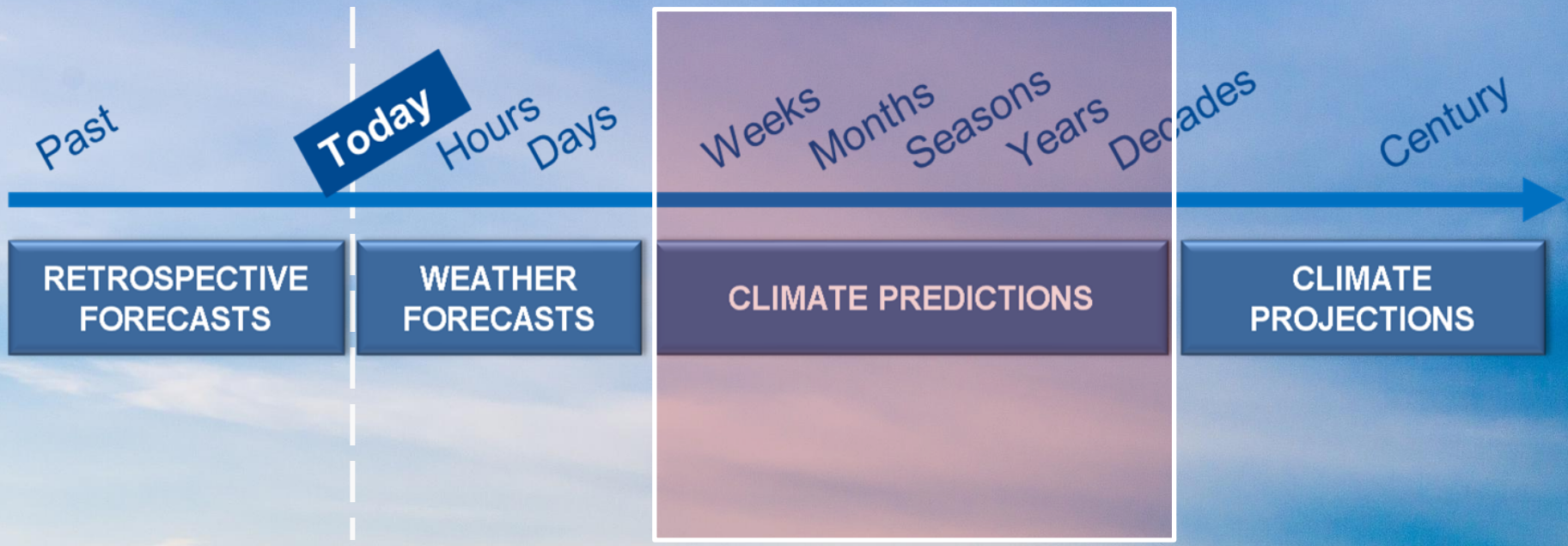
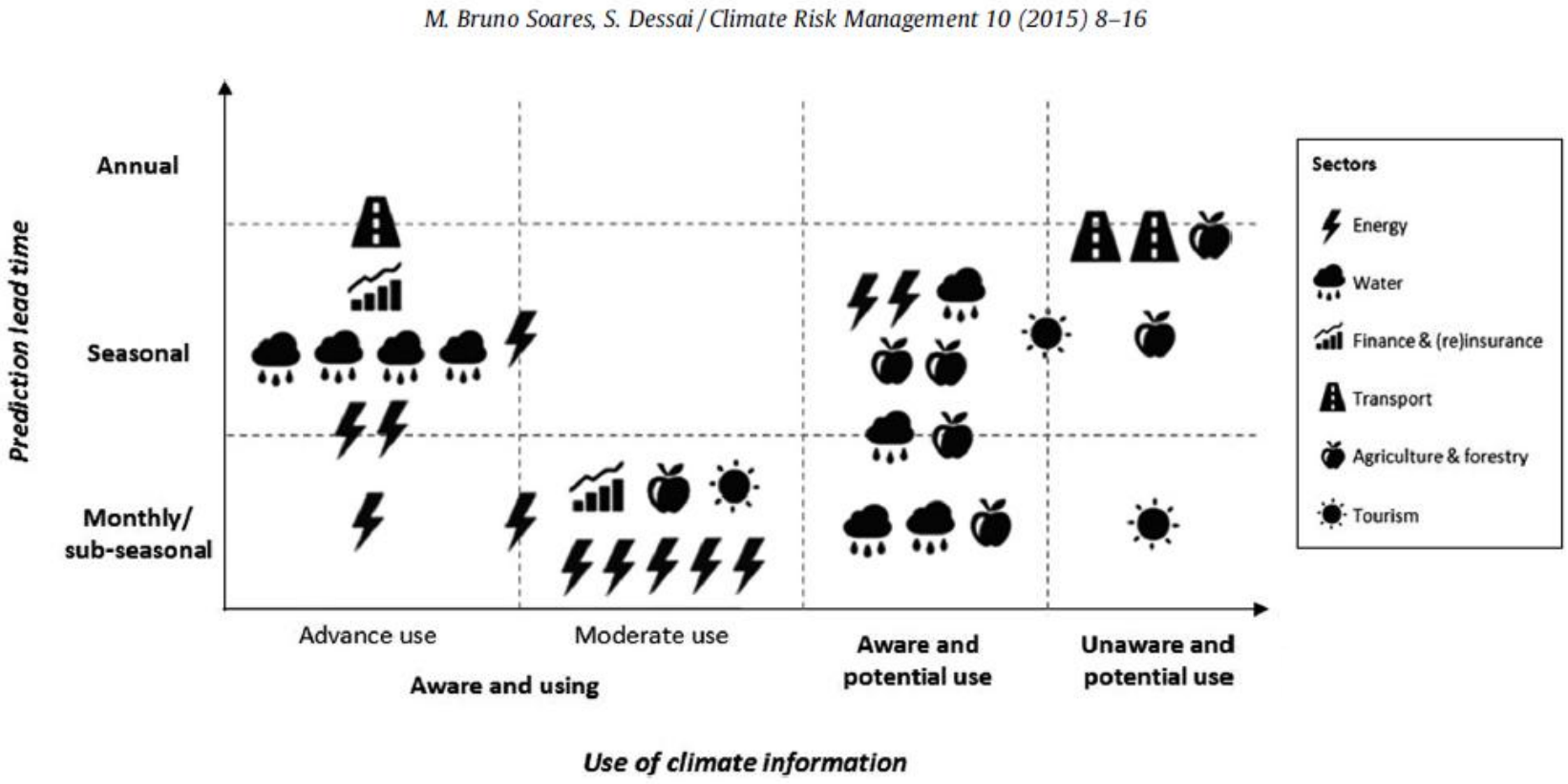


Use of climate predictions in Europe



What are the reasons to not using climate predictions?

- Probabilistic information is not easy to understand
- Lack of information on the reliability of the prediction

Need to improve communication

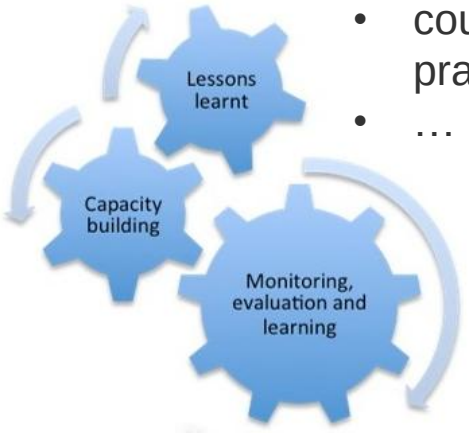
Climate services

Climate-related data → **Climate information** → **Climate knowledge**

Supports society & **climate-sensitive sectors to adapt to climate change**

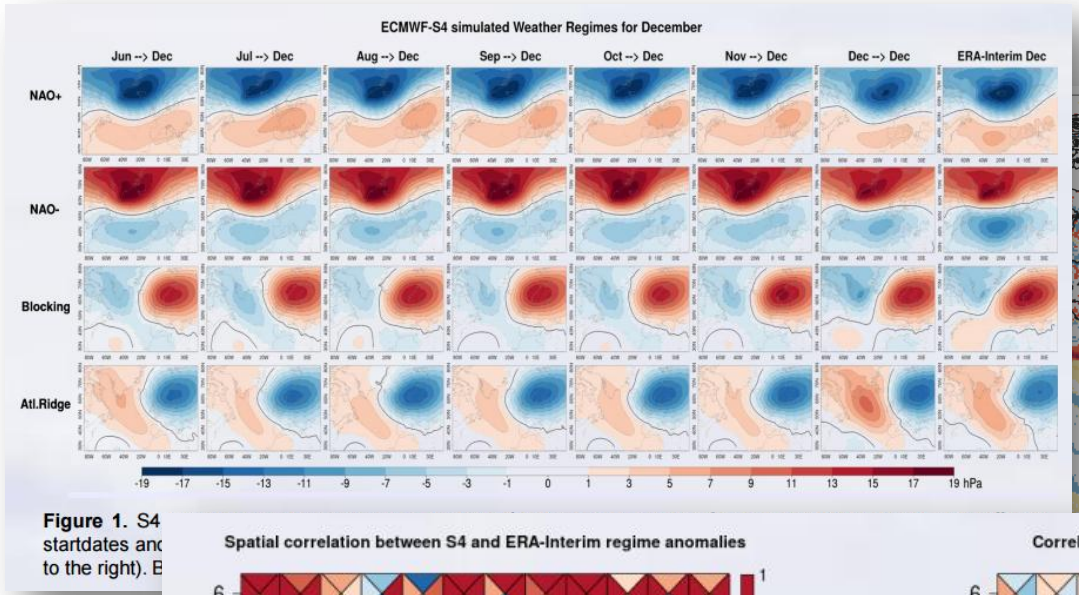
Customised products, tools and services directed to the users

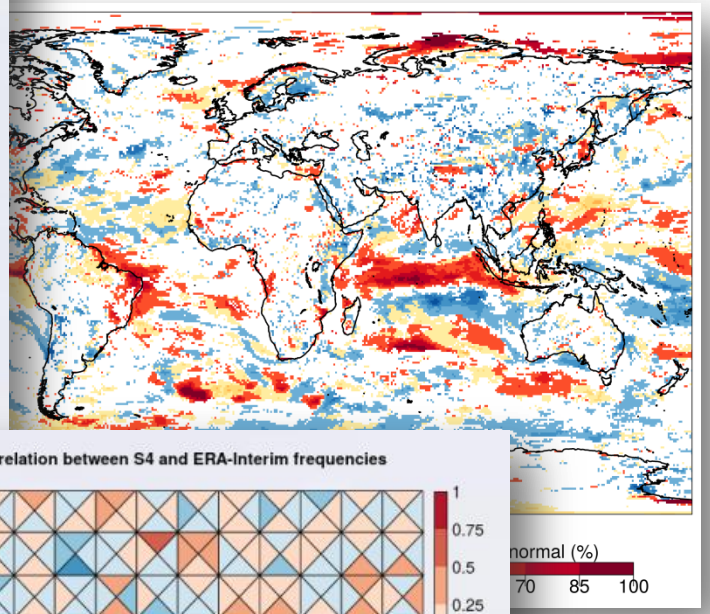
- predictions
- trends
- economic analyses
- counselling on best practices
- …

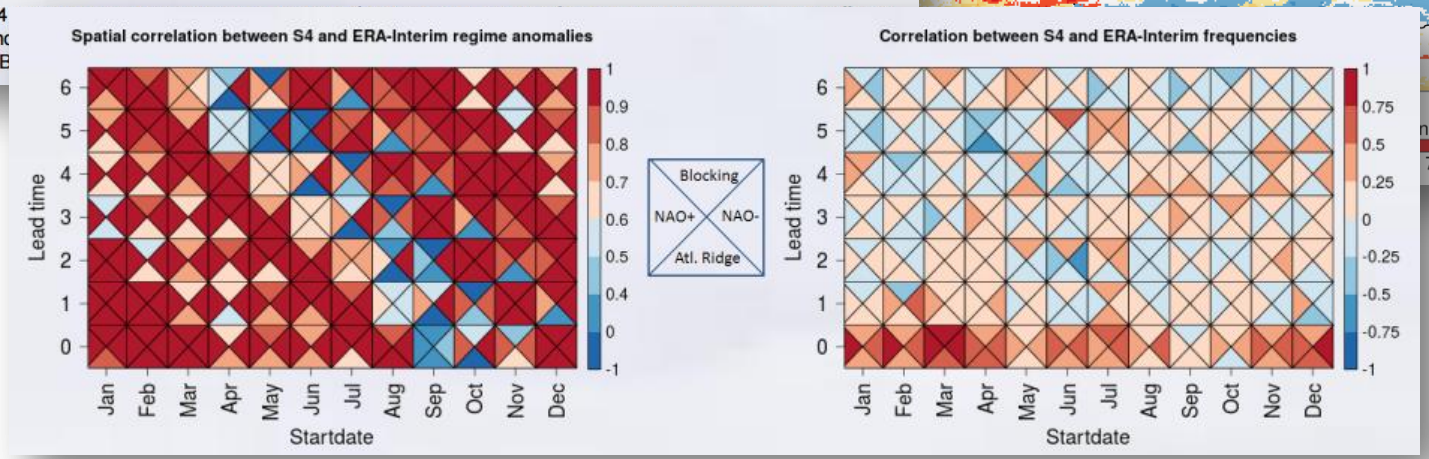


Scientist User

Climate-related data

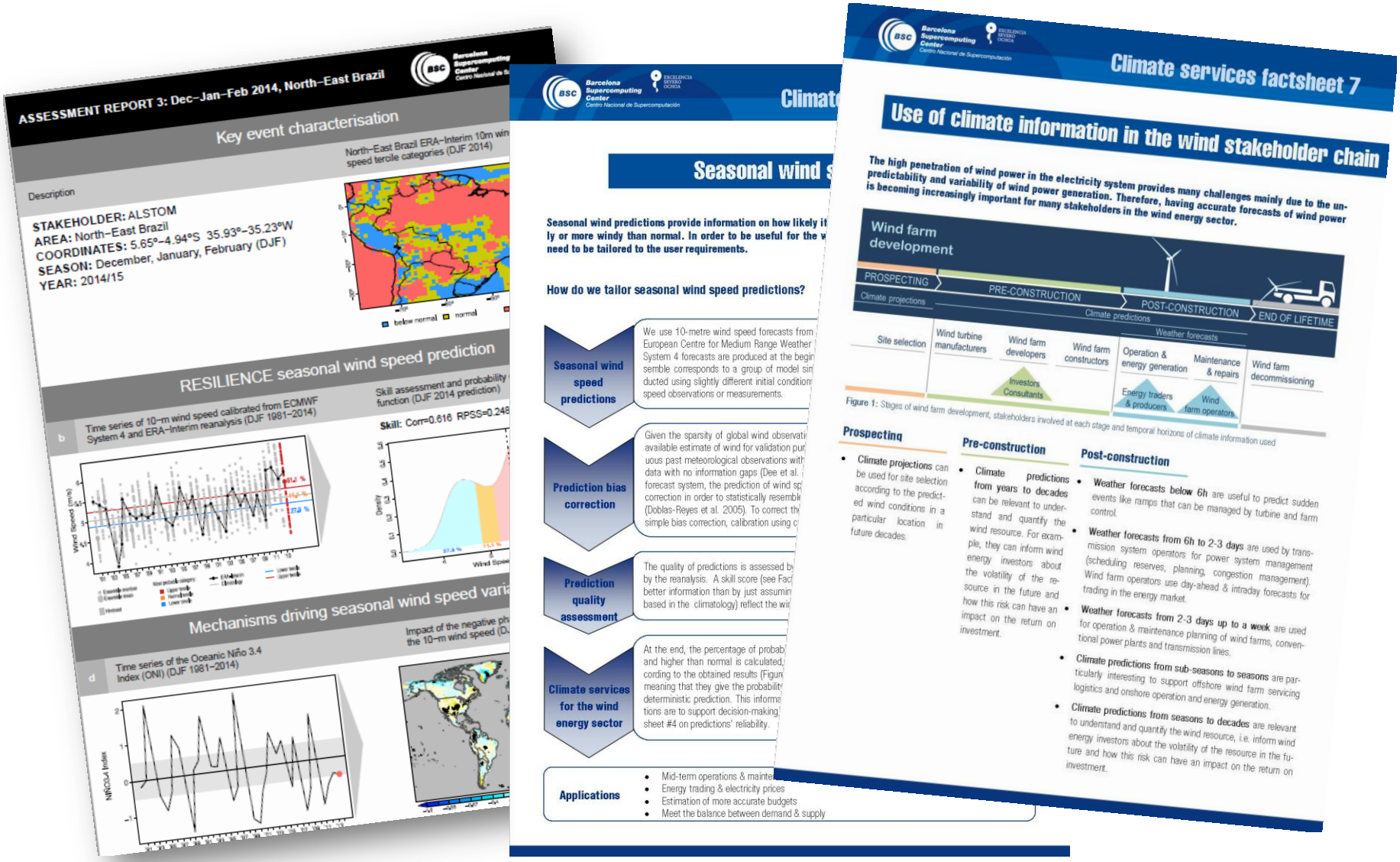






Source: ESS-BSC Catalogue, www.bsc.es/ESS/catalogue

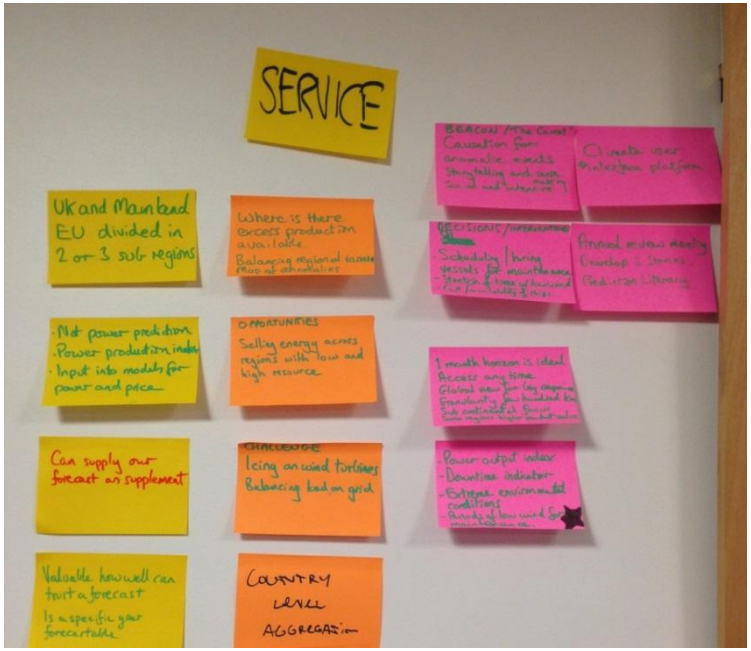
Climate information



Source: RESILIENCE project

Climate knowledge

Participatory approaches for user engagement (workshops, focus groups, interviews, surveys…)



Innovative ways of reaching users

The Weather Roulette app

Source: https://play.google.com/store/apps/details?id=es.predictia.weatherroulette&hl=es

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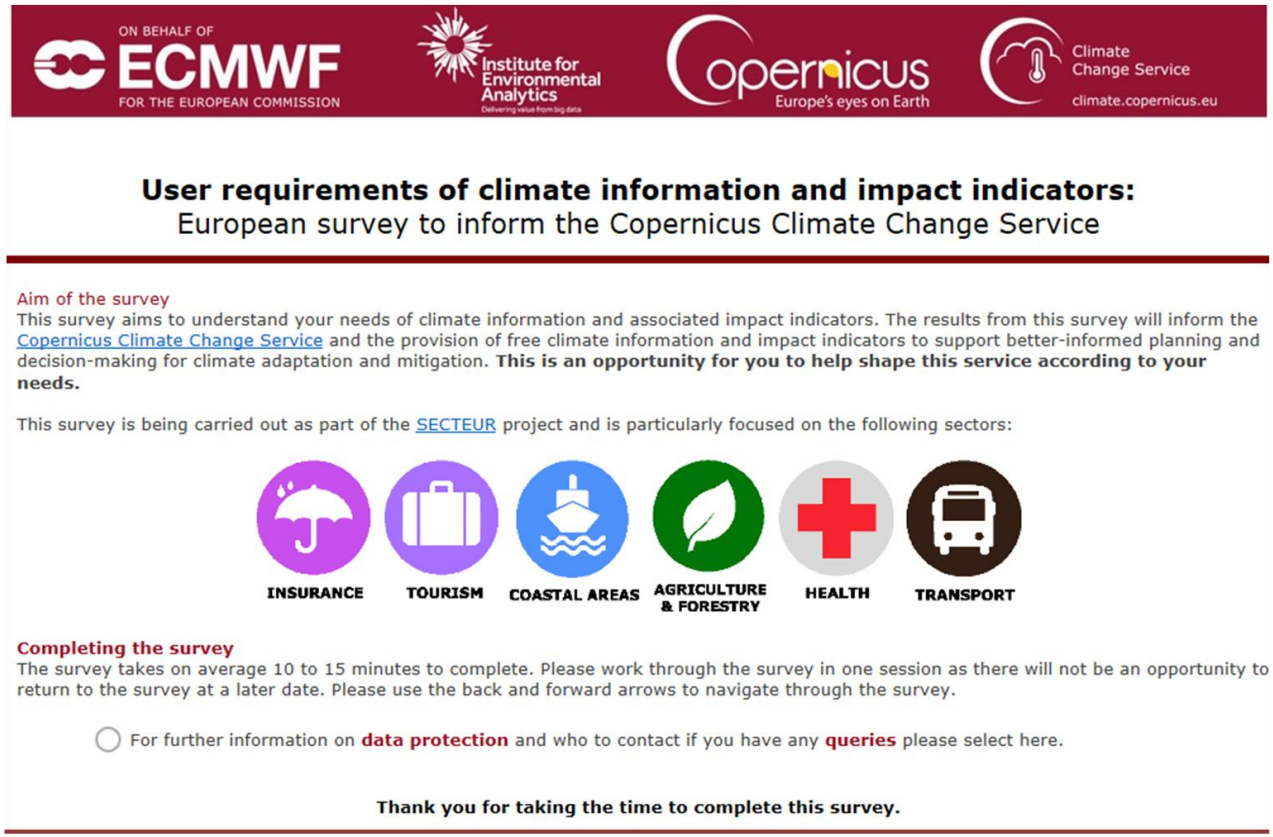
SUCCESS STORIES

Participatory approach for user engagement - Survey



ON BEHALF OF ECMWF FOR THE EUROPEAN COMMISSION

Institute for Environmental Analytics

Copernicus Europe's eyes on Earth

Climate Change Service climate.copernicus.eu

User requirements of climate information and impact indicators:
European survey to inform the Copernicus Climate Change Service

Aim of the survey
This survey aims to understand your needs of climate information and associated impact indicators. The results from this survey will inform the Copernicus Climate Change Service and the provision of free climate information and impact indicators to support better-informed planning and decision-making for climate adaptation and mitigation. **This is an opportunity for you to help shape this service according to your needs.**

This survey is being carried out as part of the SECTEUR project and is particularly focused on the following sectors:

INSURANCE TOURISM COASTAL AREAS AGRICULTURE & FORESTRY HEALTH TRANSPORT

Completing the survey
The survey takes on average 10 to 15 minutes to complete. Please work through the survey in one session as there will not be an opportunity to return to the survey at a later date. Please use the back and forward arrows to navigate through the survey.

For further information on **data protection** and who to contact if you have any **queries** please select here.

Thank you for taking the time to complete this survey.

- Inform **adaptation measures to climate change** in agriculture
- Establish a **bidirectional communication** between users and producers of climate information
- Deliver **better-tailored information** that supports decision-making in agriculture

Source: SECTEUR project, https://climate.copernicus.eu/secteur

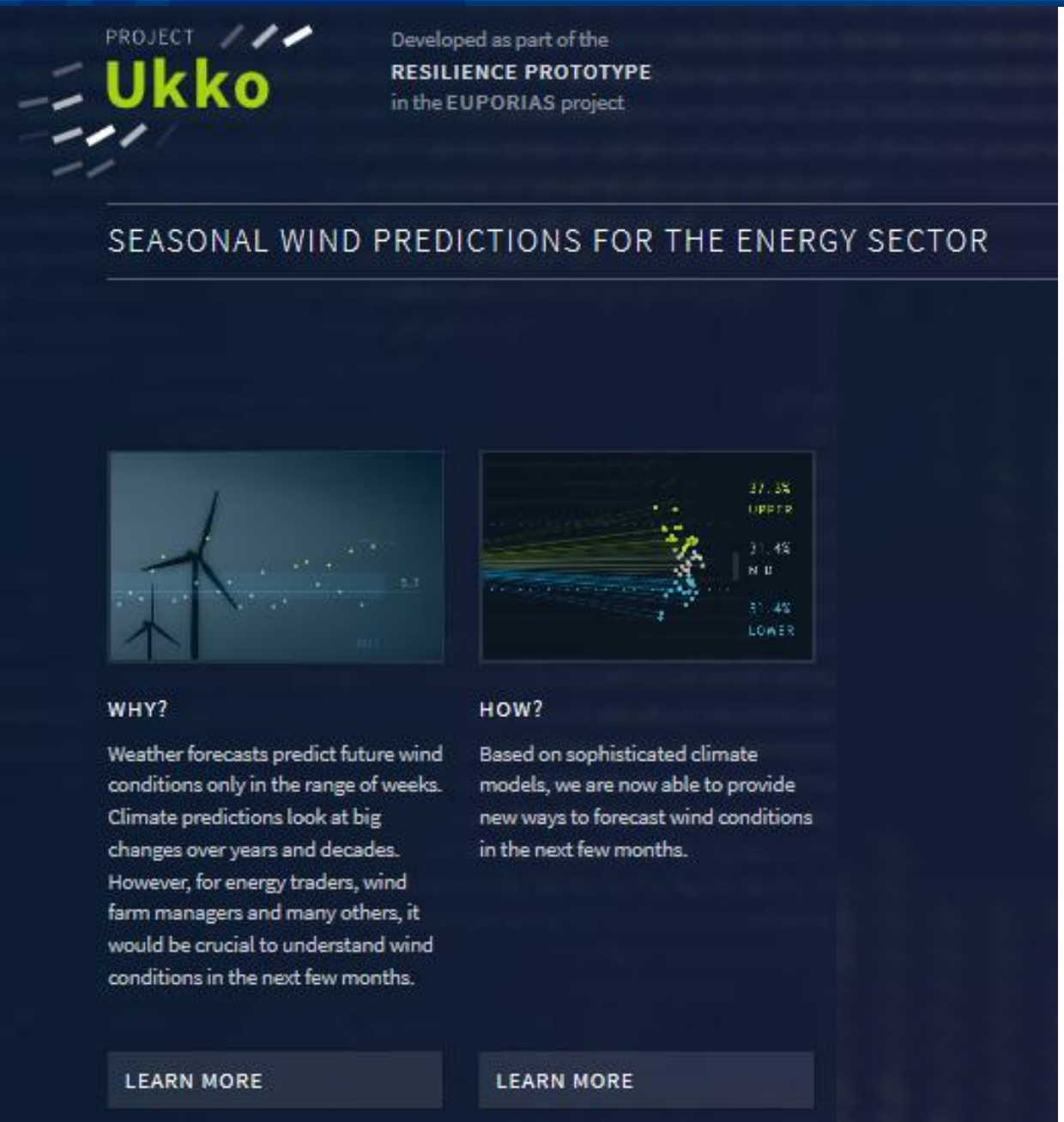
1- Climate service for agriculture

Medium-range climate predictions are **useful for the adaptation of wine producers to climate change.** Applications:

• Decision-making during the growing season (planting and harvesting dates, pruning, planning fungicide acquisition, dealing with excess product availability…)

• Crop trade in the market

2- Climate service for energy



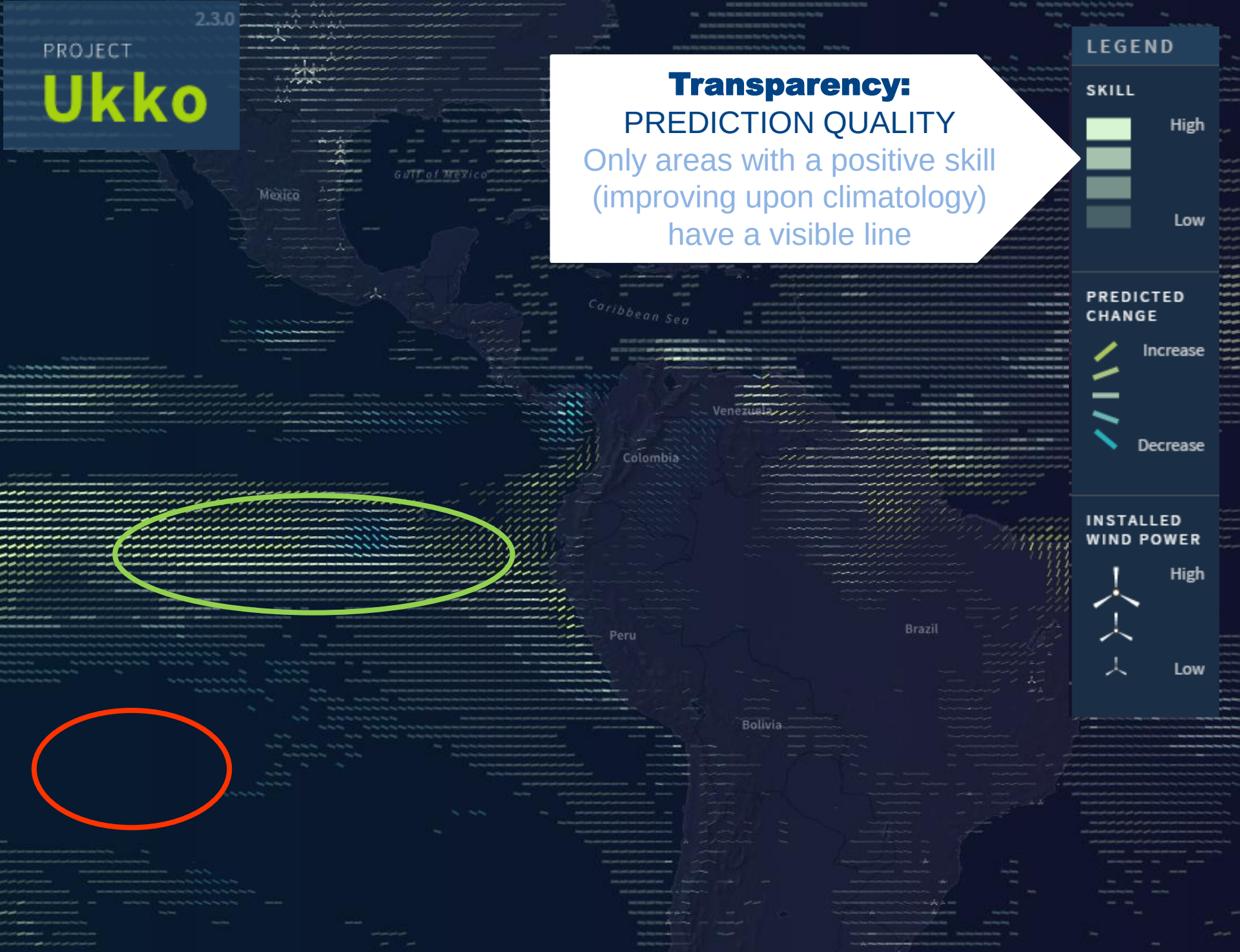
On-line visualisation tool for the wind energy sector - Project Ukko

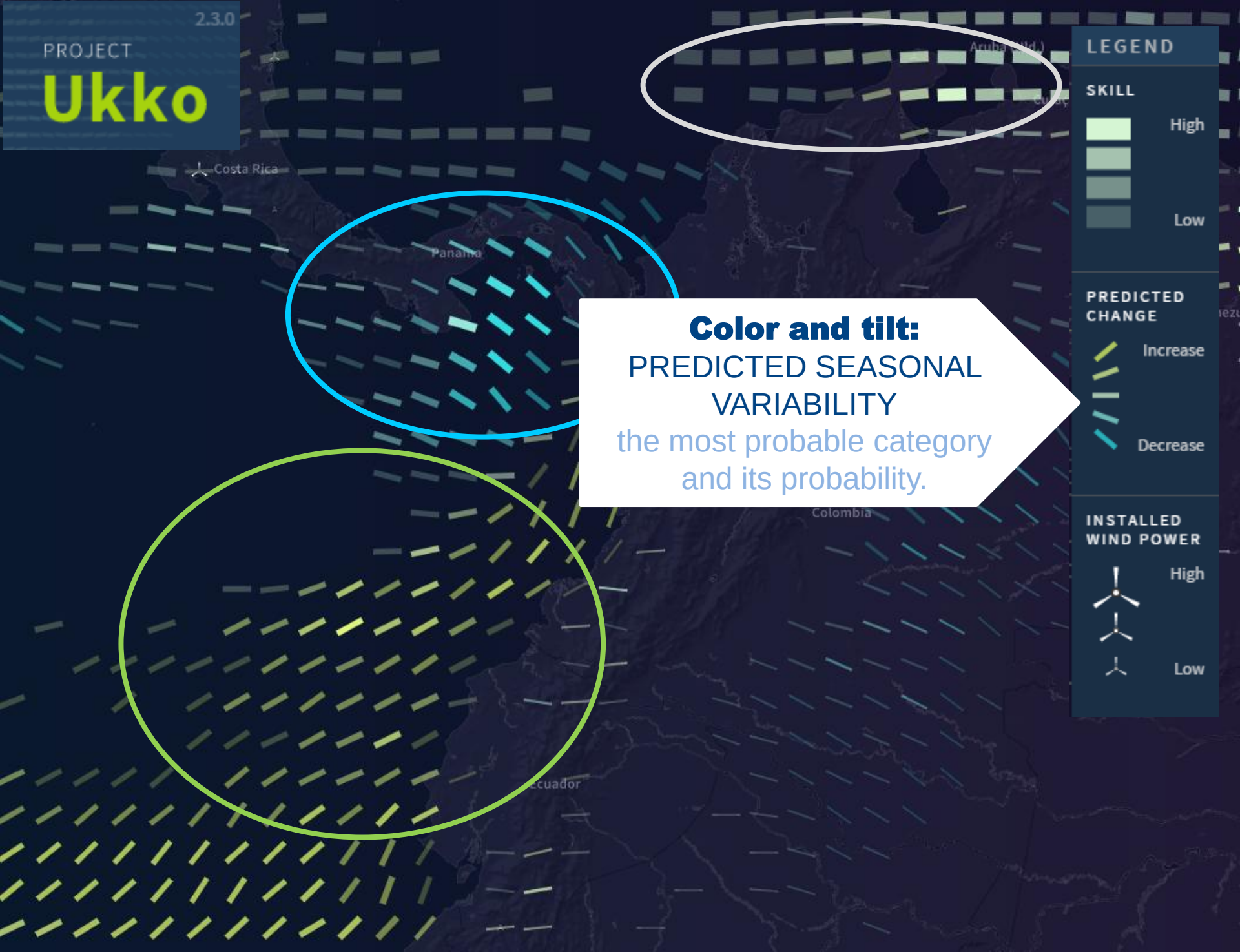
- Joint development between scientists – designers

- Provides robust information on the future variability of wind (probabilistic predictions)

Source: http://project-ukko.net/


2.3.0
PROJECT
Ukko
LEGEND
SKILL
High
Low
PREDICTED CHANGE
Increase
Decrease
INSTALLED WIND POWER
High
Low
Sargasso Sea
Gulf of Mexico
Mexico
Caribbean Sea
Venezuela
Colombia
Peru
Brazil
Bolivia


2.3.0
PROJECT
Ukko
Transparency:
PREDICTION QUALITY
Only areas with a positive skill
(improving upon climatology)
have a visible line
LEGEND
SKILL
High
Low
PREDICTED
CHANGE
Increase
Decrease
INSTALLED
WIND POWER
High
Low
Mexico
Gulf of Mexico
Caribbean Sea
Venezuela
Colombia
Peru
Brazil
Bolivia


2.3.0
PROJECT
Ukko
Costa Rica
Panama
Colombia
Ecuador
Color and tilt:
PREDICTED SEASONAL VARIABILITY
the most probable category and its probability.
LEGEND
SKILL
High
Low
PREDICTED CHANGE
Increase
Decrease
INSTALLED WIND POWER
High
Low

2.3.0

PROJECT

Ukko

Costa Rica

Panama

Aruba (Nld.)

Curaçao (Nld.)

LEGEND

SKILL

High

Low

PREDICTED CHANGE

Increase

Decrease

INSTALLED WIND POWER

High

OBSERVATIONS

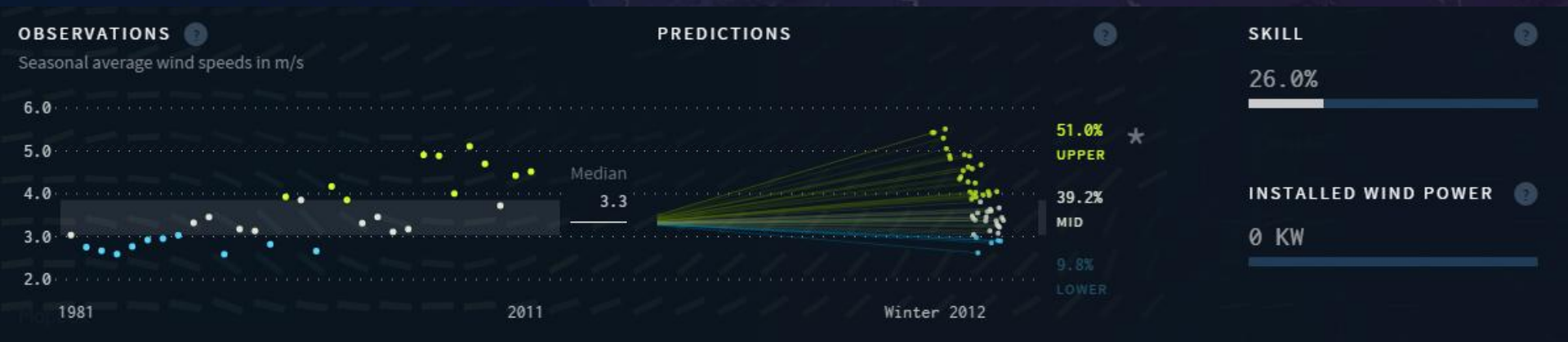
ERA-Interim 10-m wind speed reanalysis

PREDICTIONS

the most probable category and its probability.

QUALITY

RPSS skill score

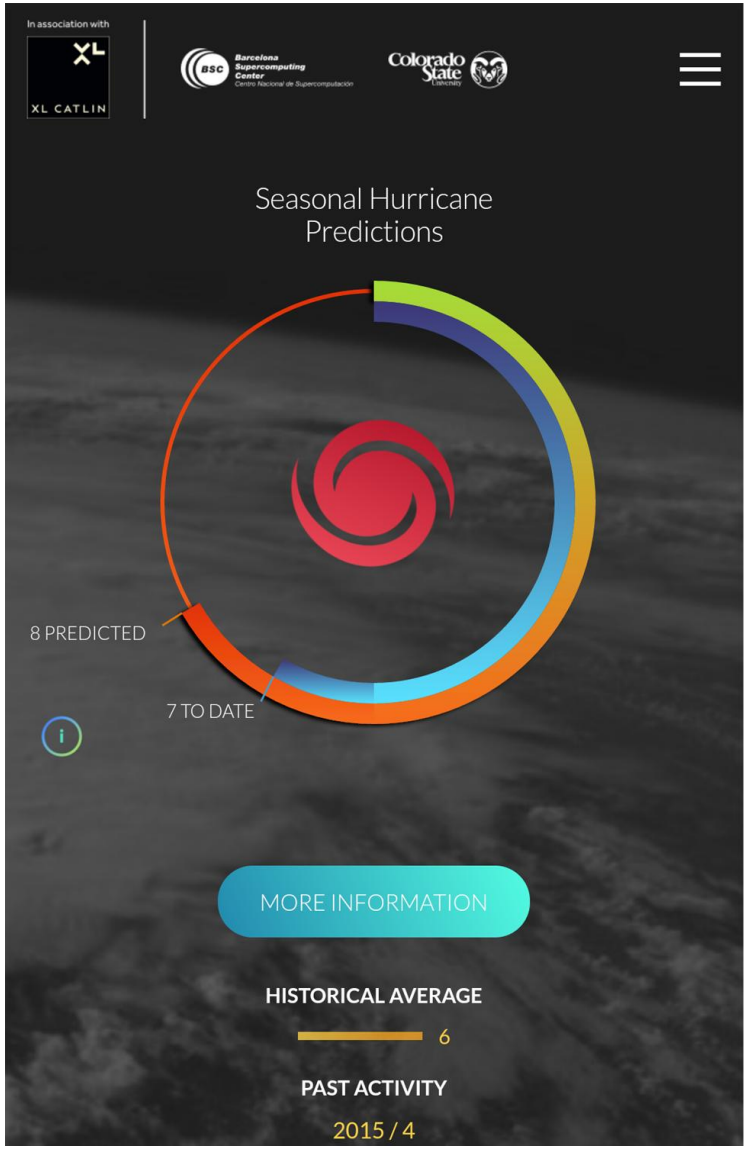


2- Climate service for energy

Medium-range climate predictions are **useful for the adaptation of the wind energy sector to climate change.** Applications:

- Planning maintenance and operations
- Energy trade in the market
- Meet the balance between energy supply and demand

3- Climate service for insurance



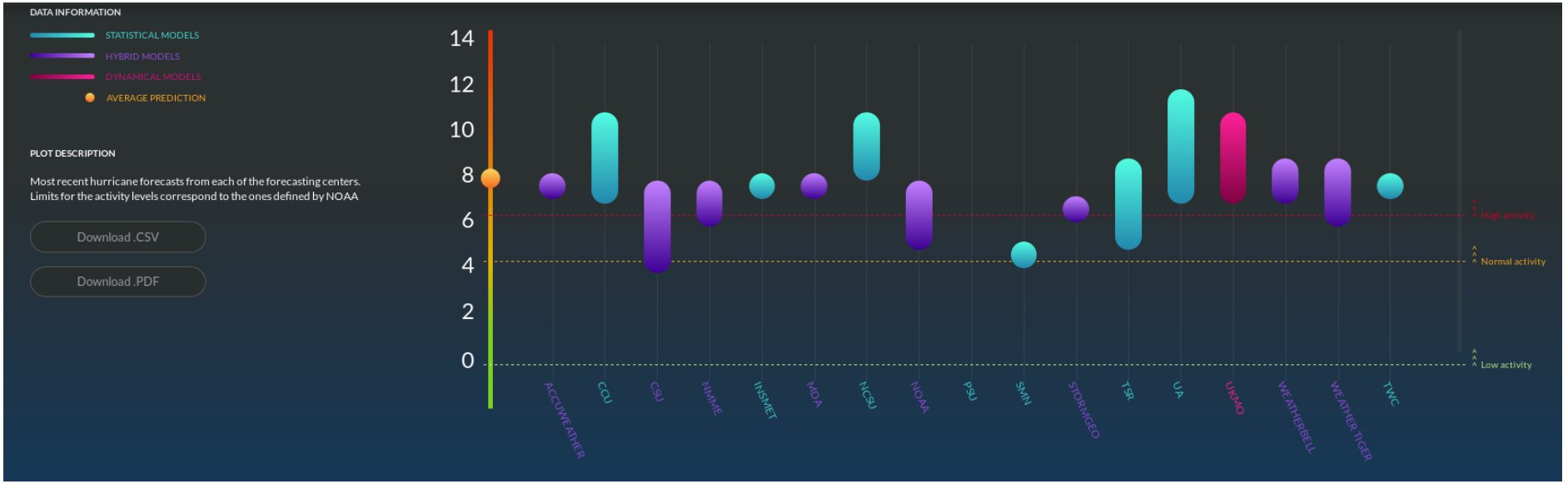
On-line visualisation platform of the seasonal hurricane activity for the re/insurance sector

- **Brings together** predictions from different centers that specialize in Atlantic hurricane forecasting
- Developed by a team of scientists, graphic designers and visualisation specialists **together with the user**
- Specific section for the scientific community & **informative section** for the general public

Source: www.seasonalhurricanepredictions.org

3- Climate service for insurance

Season 2016



Medium-range climate predictions are **useful for the adaptation of the re/insurance sector to climate change.** Applications:

- Catastrophe evaluation
- Loss estimation / Price determination
- Preparation of the claim team and client warning

3- CS for insurance – media coverage

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El portal de los profesionales del Seguro

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NOTICIAS DE SEGUROS

04 de agosto 10:03 2016 — Redacción

Crean una web que ofrece toda la información sobre huracar evolución

XL Catlin, **Barcelona Supercomput** **State University of Colorado** conjuntamente con el objetivo de pone web para hacer un seguimiento de estacionales de huracanes y la evoluci

La web **Seasonal Hurricane Predict** predicciones de los principales centros la predicción de huracanes atlánticos

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Nace Seasonal Hurricane Predictions, una web de pronósticos de huracanes y su evolución creada para el gran público

Publicado por en A

Con el objetivo de
la evolución de su
Colorado, en colal
Hurricane Predicti

EL PAÍS — CIÈNCIA

Barcelona ajuda amb la predicció d'huracans als Estats Units

El Barcelona Supercomputing Center col·labora en un web que reuneix els pronòstics dels atlàntics i l'evolució de la seva activitat


The Royal Gazette

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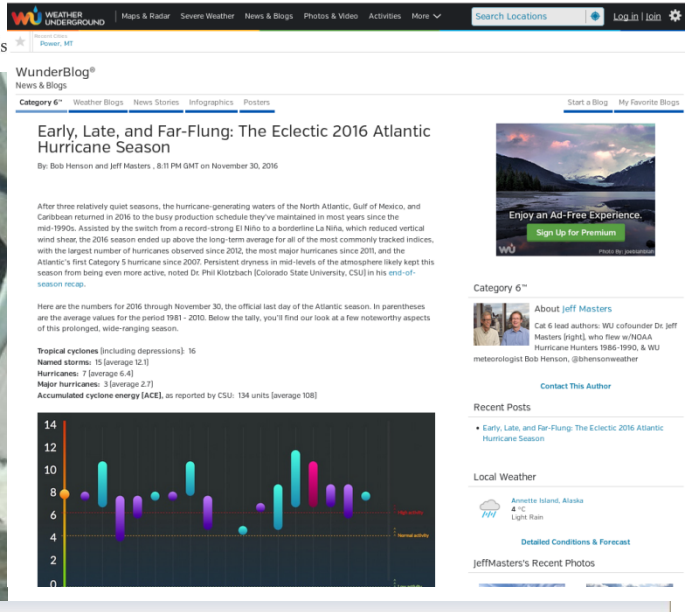
XL Catlin assist with new hurricane website


WeatherUnderground — WunderBlog®

Early, Late, and Far-Flung: The Eclectic 2016 Atlantic Hurricane Season

By: Bob Henson and Jeff Masters , 8:11 PM GMT on November 30, 2016

After three relatively quiet seasons, the hurricane-generating waters of the North Atlantic, Gulf of Mexico, and Caribbean returned in 2016 to the busy production schedule they've maintained in most years since the mid-1990s. Assisted by the switch from a record-strong El Niño to a borderline La Niña, which reduced vertical wind shear, the 2016 season ended up above the long-term average for all of the most commonly tracked indices, with the largest number of hurricanes observed since 2012, the most major hurricanes since 2011, and the Atlantic's first Category 5 hurricane since 2007. Persistent dryness in mid-levels of the atmosphere likely kept this season from being even more active, noted Dr. Phil Klotzbach [Colorado State University, CSU] in his end-of-season recap.

Here are the numbers for 2016 through November 30, the official last day of the Atlantic season. In parentheses are the average values for the period 1981 - 2010. Below the tally, you'll find our look at a few noteworthy aspects of this prolonged, wide-ranging season.

Tropical cyclones [including depressions]: 16
Named storms: 15 [average 12.1]
Hurricanes: 7 [average 6.4]
Major hurricanes: 3 [average 2.7]
Accumulated cyclone energy [ACE], as reported by CSU: 134 units [average 108]

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Category 6™ — About Jeff Masters

Cat 6 lead authors: WU cofounder Dr. Jeff Masters [right], who flew w/NOAA Hurricane Hunters 1986-1990, & WU meteorologist Bob Henson, @bhensonweather

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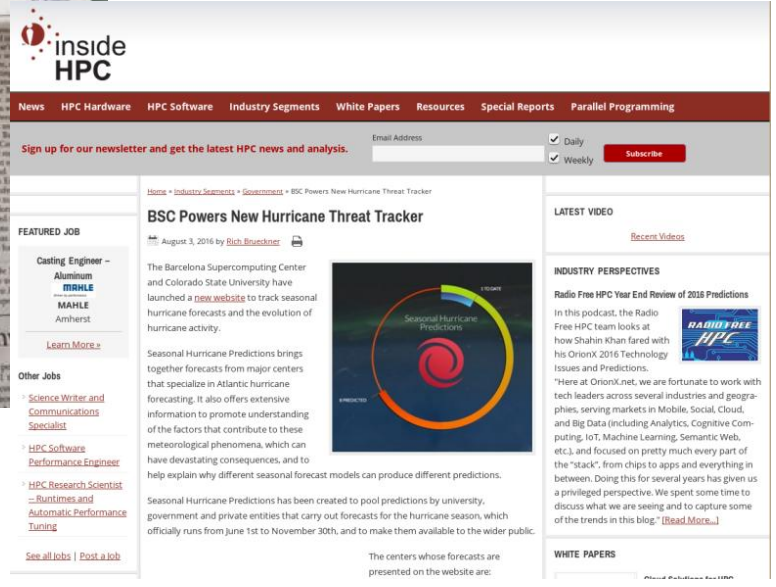
JeffMasters's Recent Photos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BSC Powers New Hurricane Threat Tracker

August 3, 2016 by Rich Brueckner

The Barcelona Supercomputing Center and Colorado State University have launched a new website to track seasonal hurricane forecasts and the evolution of hurricane activity.

Seasonal Hurricane Predictions brings together forecasts from major centers that specialize in Atlantic hurricane forecasting. It also offers extensive information to promote understanding of the factors that contribute to these meteorological phenomena, which can have devastating consequences, and to help explain why different seasonal forecast models can produce different predictions.

Seasonal Hurricane Predictions has been created to pool predictions by university, government and private entities that carry out forecasts for the hurricane season, which officially runs from June 1st to November 30th, and to make them available to the wider public.

The centers whose forecasts are presented on the website are:

FEATURED JOB — Casting Engineer – Aluminum — MAHLE — MAHLE Amherst — Learn More »

Other Jobs
- Science Writer and Communications Specialist
- HPC Software Performance Engineer
- HPC Research Scientist – Runtimes and Automatic Performance Tuning

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LATEST VIDEO — Recent Videos

INDUSTRY PERSPECTIVES — Radio Free HPC Year End Review of 2016 Predictions

In this podcast, the Radio Free HPC team looks at how Shahin Khan fared with his OrionX 2016 Technology Issues and Predictions. "Here at OrionX.net, we are fortunate to work with tech leaders across several industries and geographies, serving markets in Mobile, Social, Cloud, and Big Data (including Analytics, Cognitive Computing, IoT, Machine Learning, Semantic Web, etc.), and focused on pretty much every part of the "stack", from chips to apps and everything in between. Doing this for several years has given us a privileged perspective. We spent some time to discuss what we are seeing and to capture some of the trends in this blog." [Read More...]

WHITE PAPERS

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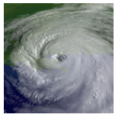

Philip Klotzbach @philklotzbach
Excited to announce new website tracking Atlantic seasonal hurricane forecasts:
http://www.bsc.es/ESS/seasonalhurricanepredictions/
... pic.twitter.com/MiY3DOvA77

Impressions	7,748
Total engagements	380
Link clicks	226
Detail expands	50
Likes	47
Retweets	21
Media engagements	15
Profile clicks	12
Replies	9

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Conclusions

• Climate services are useful to improve decision making in the context of climate change but their **use is not widespread due to some barriers**:

- communication of probabilistic information and prediction reliability
- user engagement
- tailoring of climate information

• Appropriate application **of participatory approaches and graphical visualisation tools** help to guide climate change adaptation. Examples are the presented climate services for agriculture, energy and re/insurance.

• More effort needs to be directed towards the development of **improved ways of communicating climate services to users** and the development of climate services for other climate-sensitive sectors.

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QUESTIONS?

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Europe's eyes on Earth

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The research leading to these results has received funding from the EU Seventh Framework Programme FP7 (2007-2013) under grant agreement GA 308291, the Ministerio de Economía y Competitividad (MINECO) under project CGL2013-41055-R and a contract for the Copernicus Climate Change Service implemented by ECMWF on behalf of the European Commission.

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Thank you!

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