Webinar Series: **Machine Learning for operational forecasters**

Webinar 1: **Discover Machine Learning Models for Operational Forecasters**

11 November 2025

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Welcome!

Webinar series aims:

- Provide **operational forecasters** with what you might need to know to use ECMWF machine learning model outputs effectively
  - Basics of the models (Webinar 1)
  - Accessing forecast products (Webinar 1)
  - Known issues (Webinar 2)
  - Verification (Webinar 2)
  - Case Studies (Webinar 3)
- **Encourage use**, and feedback, of ECMWF machine learning models

Please type questions in the chat – ECMWF colleagues are online to answer, we will also answer some at the end of the webinar

Your comments on your use of ML models are very welcome – we would like to better understand how you use them!

Webinar 1 - Discover Machine Learning Models for Operational Forecasters

- Introduction (Becky)
  - What ECMWF machine learning models are available
  - Basic information on models and accessing them
- The machine learning models (Gabriel)
  - Basics of how a machine model works
  - Differences between AIFS Single and AIFS ENS
  - Future Plans
- Demonstration of accessing machine model forecasts (Milana)
  - How to access via ecCharts and OpenCharts
  - Where to find more informaiton

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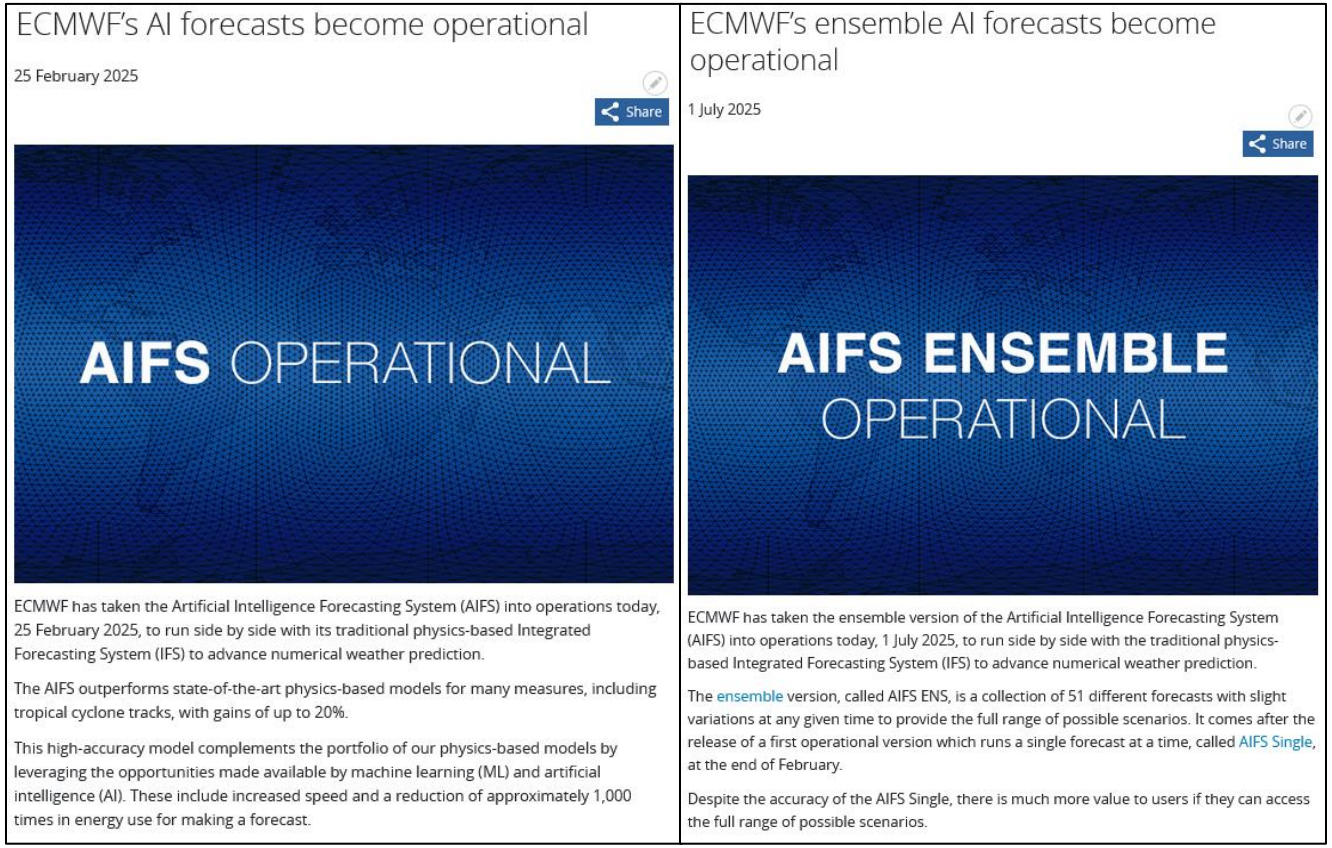
ECMWF Machine Learning models

- AIFS = Artificial Intelligence Forecasting System, ECMWF's ML models
- AIFS Single = Deterministic model
  - v1 released 25 February 2025
- AIFS ENS = Ensemble model
  - v1 released 1 July 2025



ECMWF's AI forecasts become operational

25 February 2025

Share

AIFS OPERATIONAL

ECMWF has taken the Artificial Intelligence Forecasting System (AIFS) into operations today, 25 February 2025, to run side by side with its traditional physics-based Integrated Forecasting System (IFS) to advance numerical weather prediction.

The AIFS outperforms state-of-the-art physics-based models for many measures, including tropical cyclone tracks, with gains of up to 20%.

This high-accuracy model complements the portfolio of our physics-based models by leveraging the opportunities made available by machine learning (ML) and artificial intelligence (AI). These include increased speed and a reduction of approximately 1,000 times in energy use for making a forecast.

ECMWF's ensemble AI forecasts become operational

1 July 2025

Share

AIFS ENSEMBLE OPERATIONAL

ECMWF has taken the ensemble version of the Artificial Intelligence Forecasting System (AIFS) into operations today, 1 July 2025, to run side by side with the traditional physics-based Integrated Forecasting System (IFS) to advance numerical weather prediction.

The ensemble version, called AIFS ENS, is a collection of 51 different forecasts with slight variations at any given time to provide the full range of possible scenarios. It comes after the release of a first operational version which runs a single forecast at a time, called AIFS Single, at the end of February.

Despite the accuracy of the AIFS Single, there is much more value to users if they can access the full range of possible scenarios.

- IFS = Integrated Forecasting System, which is ECMWF's NWP model

ECMWF's current operational forecasting system

ENS Control (and HRES) including ocean waves (WAM) – computationally identical in 49r1:

- 9 km, 137 levels, to 15 days at 00UTC and 12UTC and to 6 days at 06UTC and 18 UTC

Ensemble forecast (ENS) including ocean waves (WAM):

- 50 members, 9 km, 137 levels, to 15 days at 00UTC and 12UTC and atmosphere model only to 3 days at 06UTC and 18 UTC
- **ENS Sub-Seasonal (Extended-range):** once a day (00UTC), 100 members, 36 km, 137 levels, to 46 days ahead

Long range:

- **SEAS5**: Once a month, 51-members, 36 km, 91 levels, to 7 months ahead, 4 x a year to 13 months

AIFS Single v1.1 (implemented 27 August 2025):

- ~32 km, 13 levels, 4 x a day to 15 days ahead, limited parameters, 6-hourly timesteps

AIFS ENS v1 (released 1 July 2025):

- 50 members, ~32 km, 13 levels, 4 x a day to 15 days ahead, limited parameters, 6-hourly timesteps

https://confluence.ecmwf.int/display/FCST/Changes+to+the+forecasting+system
https://confluence.ecmwf.int/display/FCST/Implementation+of+AIFS+Single+v1
https://confluence.ecmwf.int/display/FCST/Implementation+of+AIFS+ENS+v1

AIFS Single and AIFS ENS key configuration values

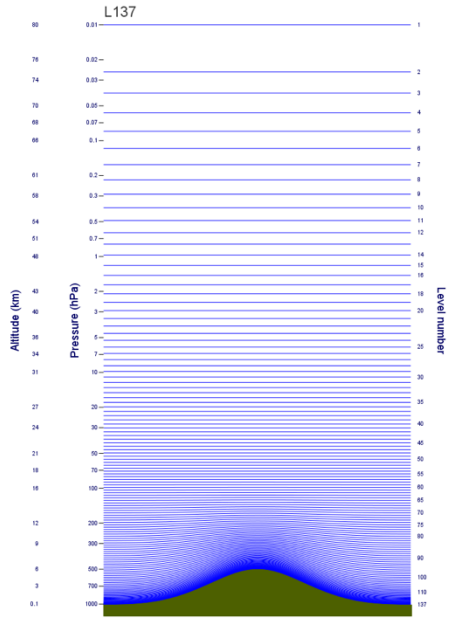
		AIFS Single v1	AIFS ENS v1
Basetime&frequency		**00/06/12/18 daily**	**00/06/12/18 daily**
Forecast range		**15-days**	**15-days**
Steps		**6 hourly**	**6 hourly**
MARS keywords	**Class**	ai	ai
	Stream	oper	enfo
	Model	aifs-single	aifs-ens
	Type	fc	cf/pf
Gaussian grid		n320	n320
Horizontal grid resolution		~32 km	~32 km
Dissemination (LL)		**0.25°**	**0.25°**
Model Level vertical resolution		**13**	**13**
Ensemble members		/	50+1

Step 0 is from the IFS analysis and has 0 values for accumulated fields.

This is the same for IFS, AIFS Single and AIFS ENS.

AIFS Model Level vertical resolution

- AIFS models have 13 levels:
  - 50, 100, 150, 200, 250, 300, 400, 500, 600,700, 850, 950, 1000 hPa
- IFS has 137 levels



AIFS Single Model forecast parameters

Field	Level type	Input/Output
Geopotential, horizontal and vertical wind components, specific humidity, temperature	Pressure level: 50, 100, 150, 200, 250, 300, 400, 500, 600, 700, 850, 925, 1000	Both ("Prognostic")
Surface pressure, mean sea-level pressure, sea-surface temperature, skin temperature, 2 m temperature, 2 m dewpoint temperature, 10 m horizontal wind components (u,v), total column water	Surface	Both ("Prognostic")
Volumetric soil moisture (vsw) and Soil temperature (sot), both at solid depth 1 and 2	Soil layer level: 1, 2	Both ("Prognostic")
100m horizontal wind components (u,v), Solar radiation (ssrd-Surface short-wave (solar) radiation downwards and strd Surface long-wave (thermal) radiation downwards), Cloud variables (tcc, hcc, mcc, lcc), Runoff (rowe) and snow fall (sf)	Surface	Output ("Diagnostic")
Standard deviation of sub-gridscale orography (sdor), Slope of sub-gridscale orography (slor)	Surface	Input ("Forcings")
Total precipitation, convective precipitation	Surface	Output ("Diagnostic")
Land-sea mask, orography, insolation, latitude/longitude, time of day/day of year	Surface	Input ("Forcings")

Implementation page:
https://confluence.ecmwf.int/display/FCST/Implementation+of+AIFS+Single+v1

ECMWF

AIFS ENS v1 raw data

Control and perturbed forecast parameters

Field	Level type	Input/Output
Geopotential (z) Specific humidity (q) Temperature (t) U component of wind (u) V component of wind (v) Vertical velocity (w)	Pressure level: 50, 100, 150, 200, 250, 300, 400, 500, 600, 700, 850, 925, 1000	Both ("Prognostic")
2 metre dewpoint temperature (2d) 2 metre temperature (2t) 10 metre U wind component (10u) 10 metre V wind component (10v) Mean sea level pressure (msl) Skin temperature (skt) Surface pressure (sp) Total column water (tcw)	Surface	Both ("Prognostic")
Soil temperature (sot), at solid depth 1 and 2	Soil layer level	Both ("Prognostic")
Total precipitation (tp) 100 metre U wind component (100u) 100 metre V wind component (100v) Surface short-wave (solar) radiation downwards (ssrd) Surface long-wave (thermal) radiation downwards (strd) Cloud variables (tcc, hcc, mcc, lcc), Runoff water equivalent (surface plus subsurface) (rowe) Snowfall water equivalent (sf)	Surface	Output ("Diagnostic")
Standard deviation of sub-gridscale orography (sdor) Slope of sub-gridscale orography (slor) Land-sea mask (lsm), orography, insolation, latitude/longitude, time of day/day of year	Surface	Input ("Forcings")

Implementation page:
https://confluence.ecmwf.int/display/FCST/Implementation+of+AIFS+ENS+v1

ECMWF

AIFS ENS v1 raw data

Post-processed parameters

Field	Statistic	Level type
2 metre temperature 10 metre wind speed 100 metre wind speed Mean sea level pressure	Ensemble mean and standard deviation	Surface
Geopotential, temperature, wind speed	Ensemble mean and standard deviation	Pressure level: 250, 300, 500, 850, 1000
2 metre temperature less than 273.15 K Total precipitation of less than 0.1 mm 10 metre Wind speed of at least 10 m/s and 15 m/s Total precipitation of at least 1 mm/5 mm/10 mm/20 mm/25 mm/50 mm/100 mm Total precipitation rate less than 1 mm/day Total precipitation rate of at least 3 mm/day Total precipitation rate of at least 5 mm/day	Probabilities	Surface

Implementation page:
https://confluence.ecmwf.int/display/FCST/Implementation+of+AIFS+ENS+v1

Updates to the models

- All ECMWF models (AIFS and IFS) adhere to operational upgrade procedures
  - Documentation including implementation pages and webinars
  - Test data available prior to making models operational
  - Communications
- Under current plans
  - AIFS Single and AIFS ENS will become v2 at the same time as IFS 50r1 – Early 2026
  - Smaller updates e.g. vX.1, vX.2… can happen at other times

https://confluence.ecmwf.int/display/FCST/Changes+to+the+forecasting+system
https://confluence.ecmwf.int/display/FCST/Implementation+of+AIFS+Single+v1
https://confluence.ecmwf.int/display/FCST/Implementation+of+AIFS+ENS+v1

Accessing AIFS model forecast data

Milana will demo how to access machine learning model forecasts later in this webinar

- OpenCharts: https://charts.ecmwf.int/
  - Free to access for all, no login required
- ecCharts: https://eccharts.ecmwf.int/
  - Login required
  - Each WMO country has access with their wmo_xx UserID
- WMS service: https://eccharts.ecmwf.int/wms/
  - The same licence as ecCharts
- Open data (raw data, not images): https://data.ecmwf.int/forecasts/
  - Free to access for all, no login required

How to access ecCharts

- All ECMWF Member and Co-operating States have access with personal organisational email addresses or joined accounts. Your Computing Representative should assign each account the relevant permissions
- All existing wmo_xx (xx = two letter country code) UserIDs have been assigned the relevant ecCharts policy
- Users who know their userID and password can log in and start using ecCharts immediately
- If you don't know your wmo_xx UserID, you can contact ECMWF via our Support Portal for the details
- To update your WMO login details, we require confirmation of the change from the Permanent Representative of your country https://confluence.ecmwf.int/display/DAC/Request+change+of+WMO+account

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Neural networks as universal approximation systems

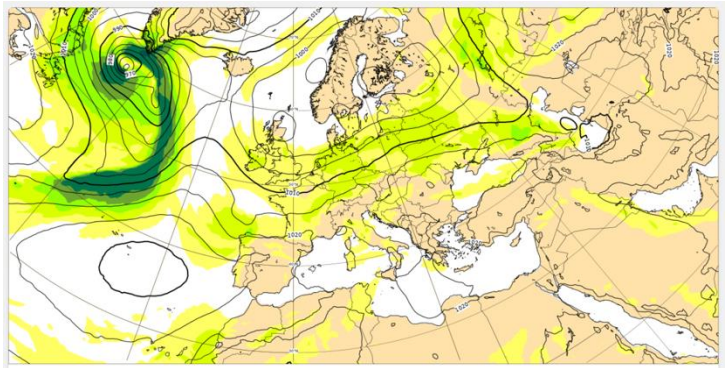
Given enough compute and data any relationship can be learnt….

Is this true for weather forecasting?

ECMWF

Data?

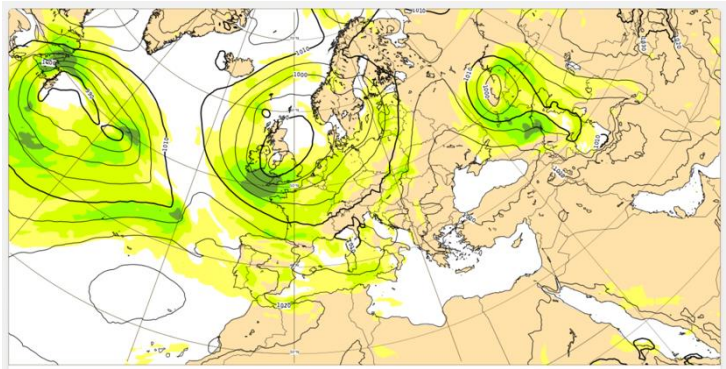
Analysis



Fusion of short-range forecast with latest observations

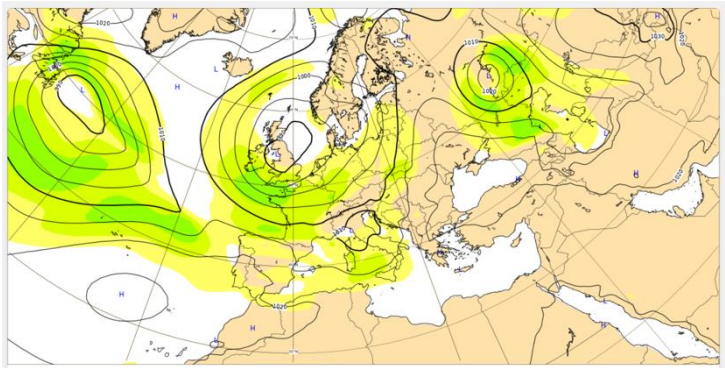
NWP Model

Forecast



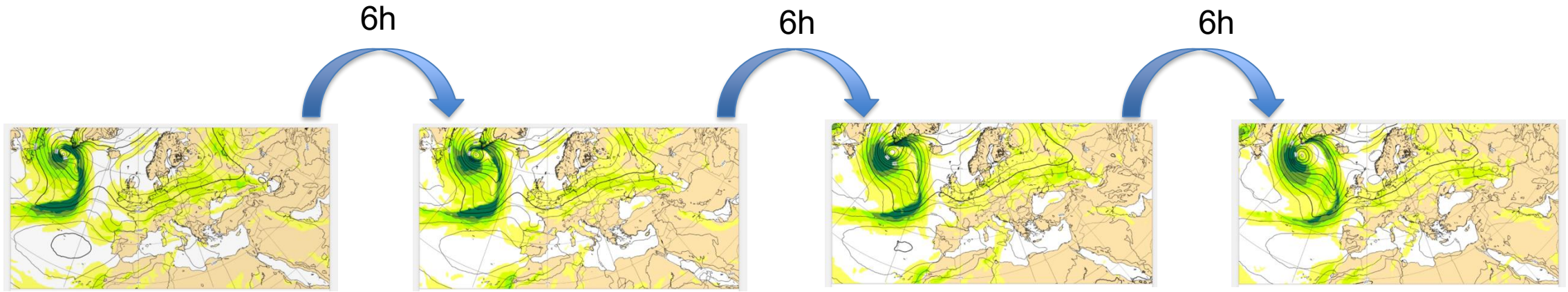
Data Driven Model

Learned from 40 years of **ERA5** analyses



Weather Forecasts – Data Driven?

Here, the **models learn from ca. 40 years of ECMWF's ERA5 re-analysis data**, stepping e.g. 6h from analysis to analysis



The forecast is then **autoregressively** stepping 6h into the future $x_n = f(x_{n-1})$ …

Variables used in AIFS v1

A mix of **prognostic**, **diagnostic**, and **forcing** variables:

- **Upper Atmosphere (13 pressure levels)**
  - **Geopotential height**
  - **Wind components (u, v)**
  - **Specific humidity**
  - **Temperature**
- **Surface Variables**
  - **2 m temperature**
  - **10 m wind speed**
  - **Precipitation**
  - **…**
- **External Forcings**
  - **Orography**
  - **Insolation**
  - **Latitude / Longitude**
  - **Time of day / Time of year**

Variable name	Short name	Level type Pressure level (50-1000 hPa) or Surface	Variable type: Prognostic, Diagnostic, Forcing	Normalization	Scaling
Geopotential	z	Pl	P	Z-score	12
Horizontal wind components	u, v	Pl	P	Z-score	0.8, 0.5
Specific humidity	q	Pl	P	Std	0.6
Temperature	t	Pl	P	Z-score	6
Surface pressure	sp	S	P	Z-score	10
Mean sea-level pressure	msl	S	P	Z-score	1
Skin temperature	skt	S	P	Z-score	1
2 m temperature	2t	S	P	Z-score	1
2 m dewpoint temperature	2d	S	P	Z-score	0.5
10 m horizontal wind components	10u, 10v	S	P	Z-score	0.5, 0.5
Total column water	tcw	S	P	Std	1
Volumetric soil water level 1 and 2*	swvl1, swvl2	S	P	None	1, 2
Soil temperature level 1 and 2*	stl1, stl2	S	P	None	1, 10
Total precipitation	tp	S	D	Std	0.025
Convective precipitation	cp	S	D	Std (tp)	0.0025
Snowfall*	sf	S	D	Std (tp)	0.025
Total cloud cover*	tcc	S	D	None	0.1
High cloud cover*	hcc	S	D	None	0.1
Medium cloud cover*	mcc	S	D	None	0.1
Low cloud cover*	lcc	S	D	None	0.1
Runoff*	ro	S	D	Std	0.005
Surface solar radiation downwards*	ssrd	S	D	Std	0.05
Surface thermal radiation downwards*	strd	S	D	Z-score	0.1
100 m horizontal wind components*	100u, 100v	S	D	Z-score	0.1, 0.1
Land-sea mask	lsm	S	F	None	
Orography	z	S	F	Max	
Standard deviation of sub-grid orography	sdor	S	F	Max	
Slope of sub-scale orography	slor	S	F	Max	
Insolation	insolation	S	F	None	
Latitude/longitude (cos/sin)	lat/lon	S	F	None	
Time of day/day of year	local time, julian day	S	F	None	

Table 1: Variables used in the training of AIFS, with their short names, level type, variable type, normalization method, and scaling factors. Variables marked with * were newly introduced compared to AIFS v0.2.1.

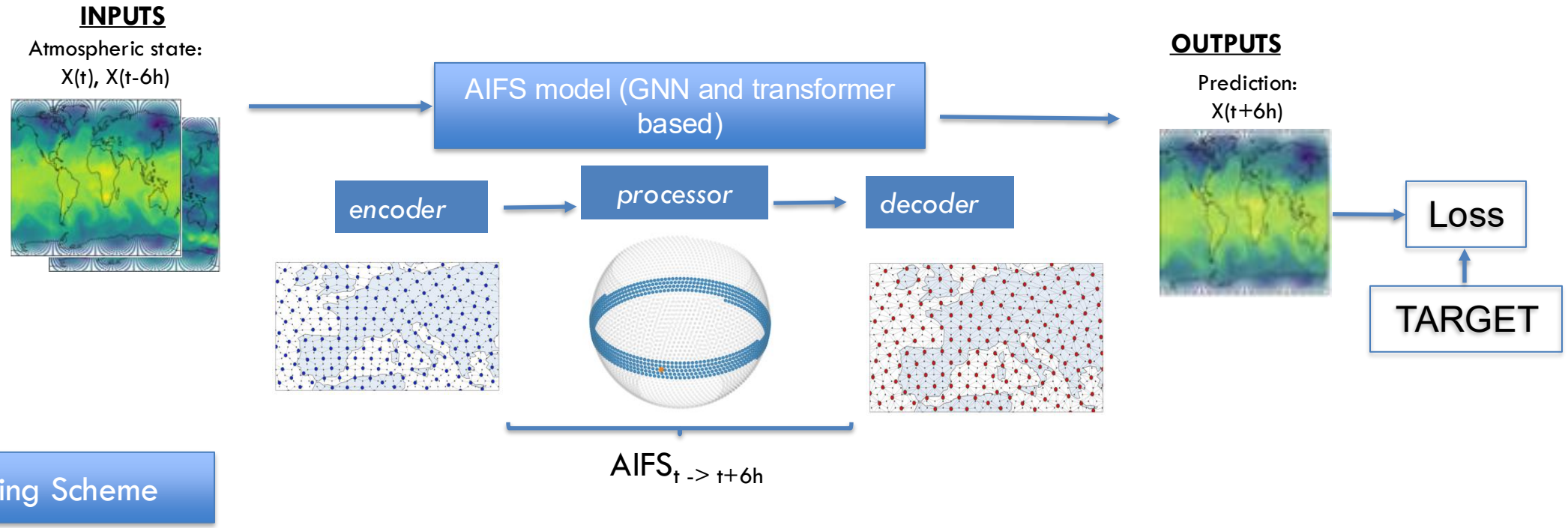
https://doi.org/10.5194/egusphere-2025-4716

https://arxiv.org/abs/2406.01465

https://doi.org/10.5194/egusphere-2025-4716

AIFS - Artificial Intelligence Forecasting System

TRAINING

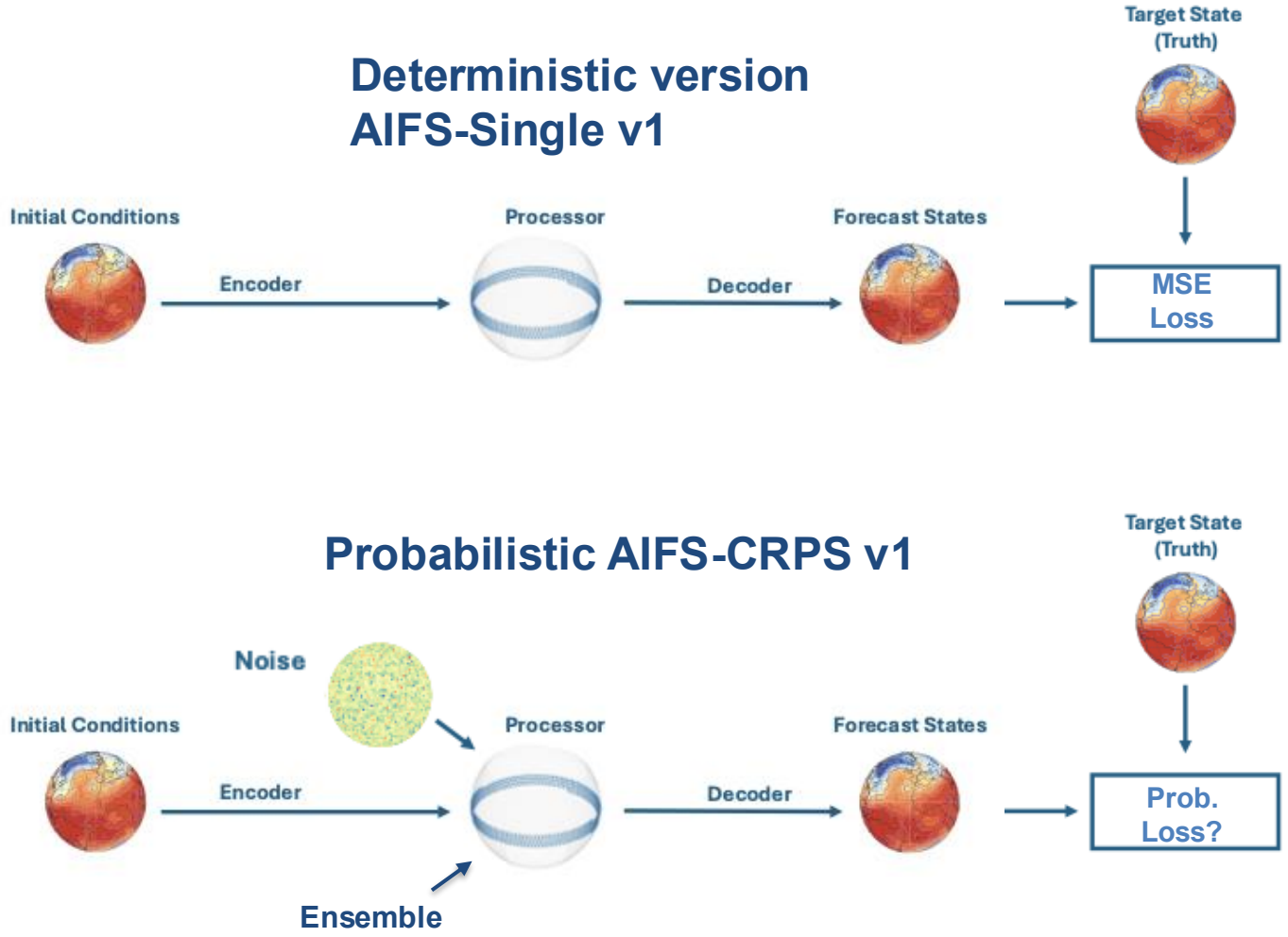


Training Scheme

Step 1: pre-training phase, during which the model is given the task to forecast 6h ahead

Step 2: model is autoregressively trained to optimise forecasts between 6h and 72h ahead

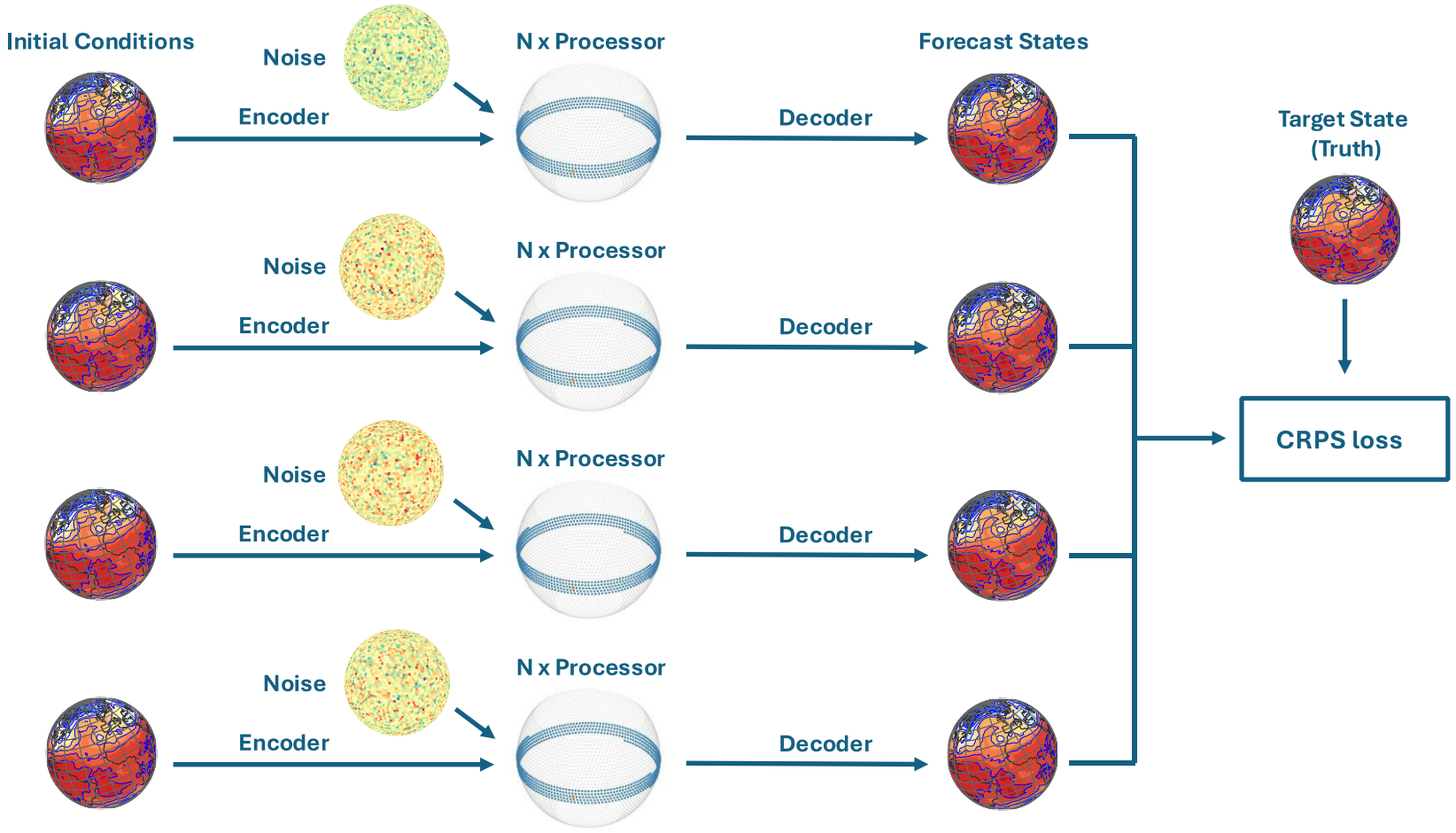
AIFS Probabilistic vs Deterministic



Proper score loss – AIFS-CRPS:

https://arxiv.org/abs/2412.15832

In training: run (small) ensemble:

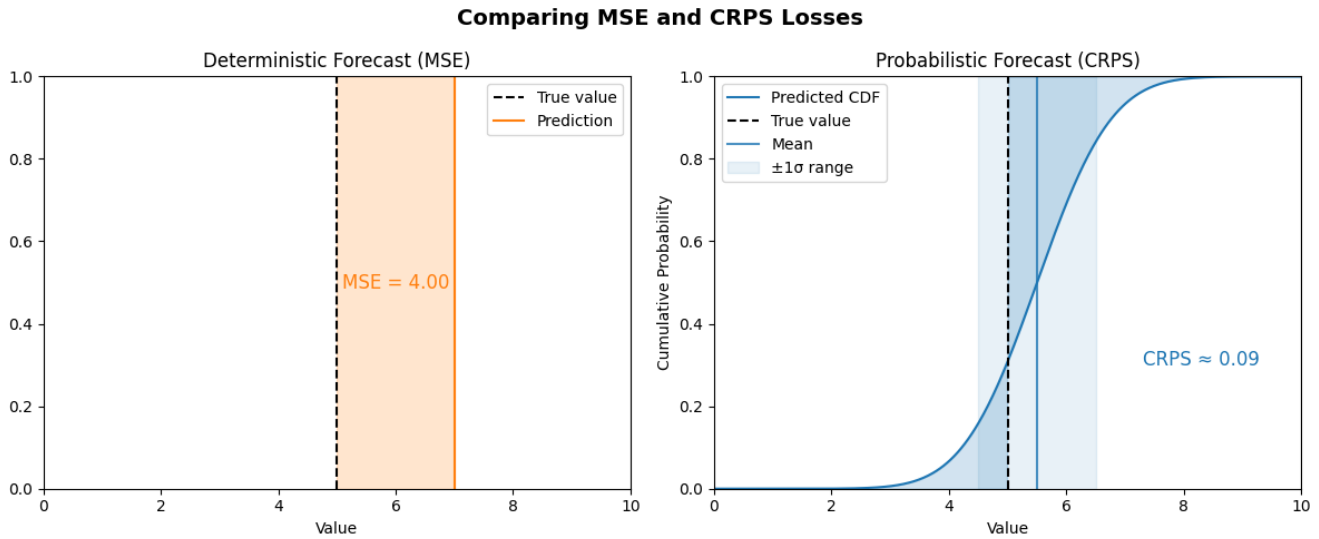


To generate a forecast (single member): run model with noise realization for each forecast step

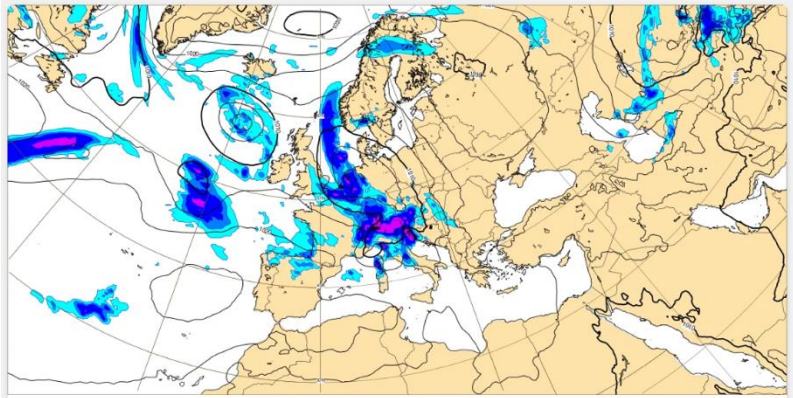
CRPS vs MSE

- Regression losses (MSE, MAE):
  - Robust and easy to implement
  - Penalises large errors strongly
  - Will produce smooth fields.
- Probabilistic (CRPS, Energy Score):
  - Harder to implement (ensemble needed)
  - Evaluates full predictive distribution

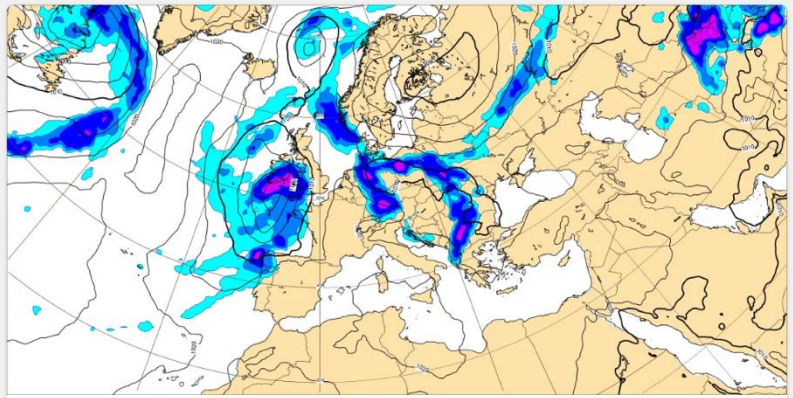
What should the model care about?



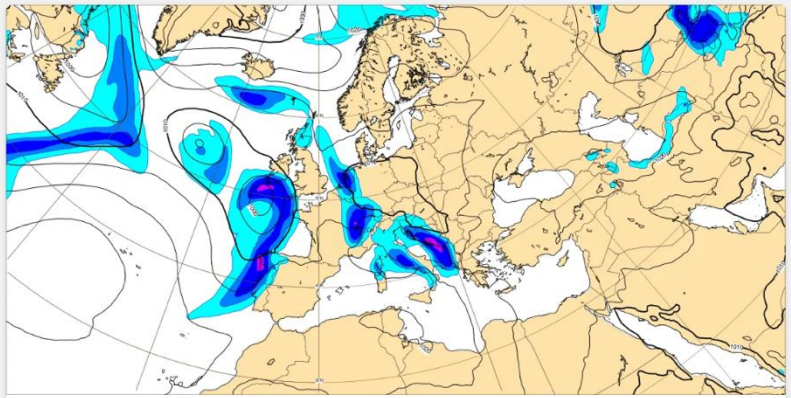
CRPS: CDF should match the observation step CDF function
MSE: minimise forecast error



Rain and mean sea level pressure



AIFS CRPS : Rain and mean sea level pressure



AIFS Single: Rain and mean sea level pressure

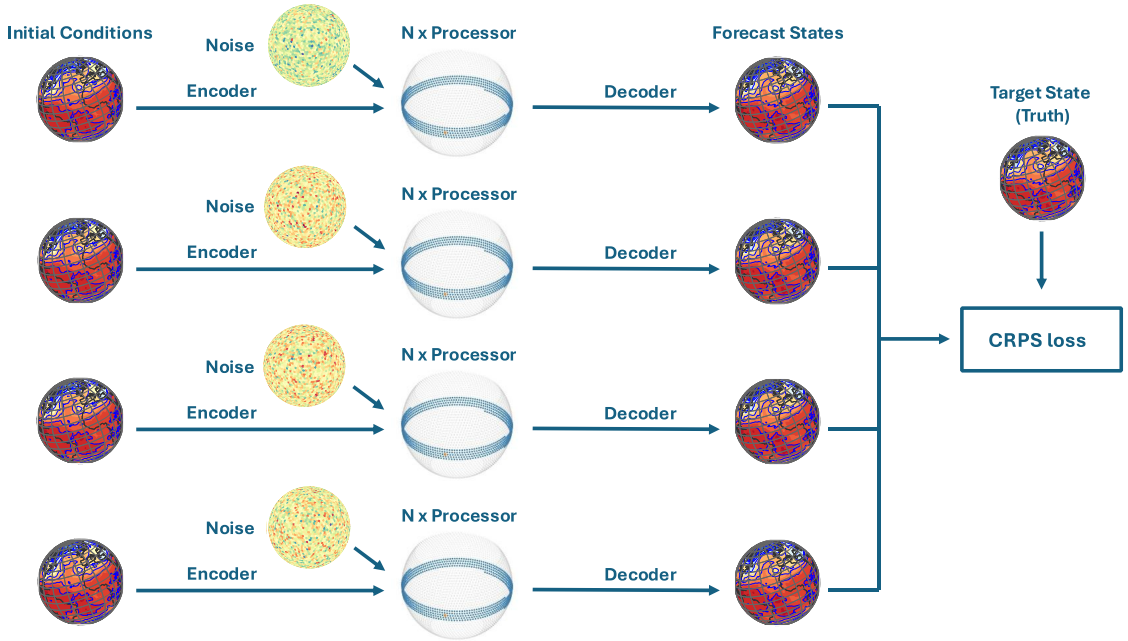
AIFS-ENS:

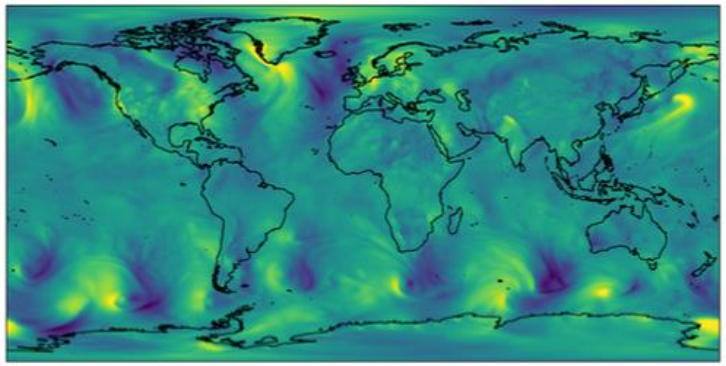
Probabilistic training of AIFS:

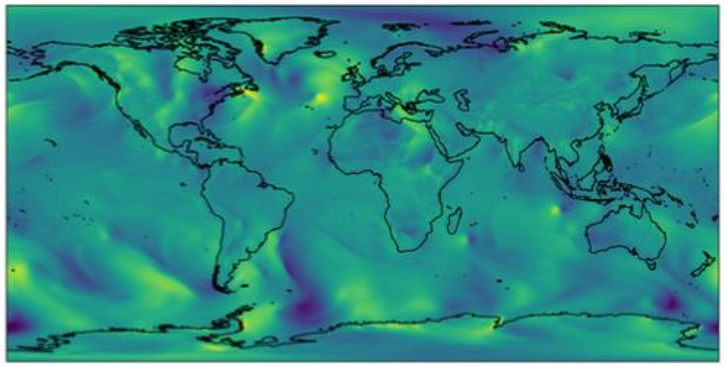
$$\text{afCRPS}_\alpha := \alpha\,\text{fCRPS} + (1-\alpha)\text{CRPS}$$

$$= \frac{1}{M}\sum_{j=1}^{M}|x_j - y| - \frac{M-1+\alpha}{2M^2(M-1)}\sum_{j=1}^{M}\sum_{k=1}^{M}|x_j - x_k|$$

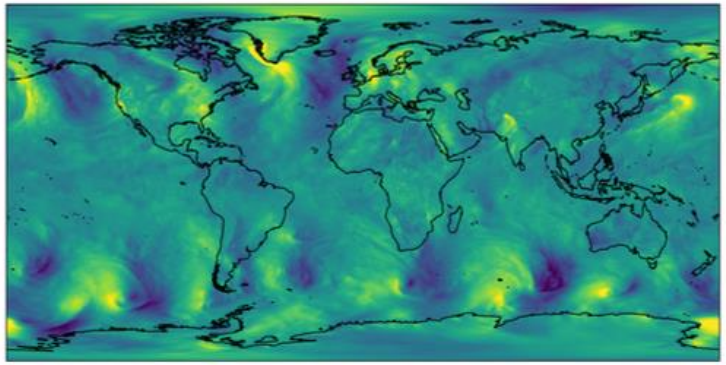
$$= \frac{1}{M}\sum_{j=1}^{M}|x_j - y| - \frac{1-\epsilon}{2M(M-1)}\sum_{j=1}^{M}\sum_{k=1}^{M}|x_j - x_k|$$

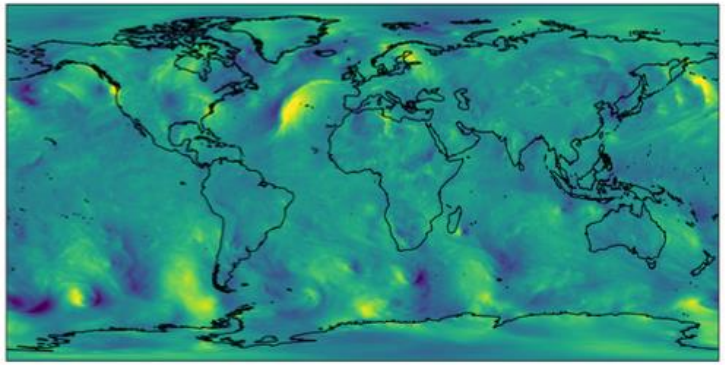






AIFS-single, day 1 and 10





AIFS-ENS, day 1 and 10

AIFS-ENS and AIFS-Single:

AIFS-Single v1 operational since February 2025
and AIFS-CRPS v1 July 2025

AIFS-ENS Forecast configuration:

50 perturbed member, starting from the perturbed initial conditions of the IFS-ENS

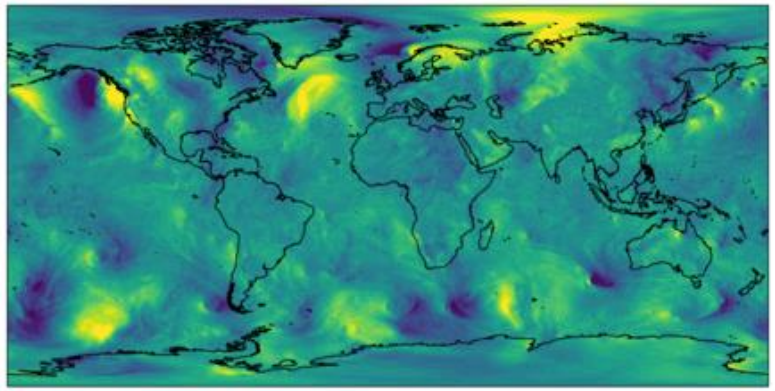
1 control member, starting from the unperturbed initial conditions of the IFS-ENS control (model uncertainty from the injected noise)

15-day forecasts, N320 (~ 0.25) resolution, 6 hourly output

AIFS-Single Forecast configuration:

1 forecast started from the unperturbed member in initial conditions of the IFS-ENS

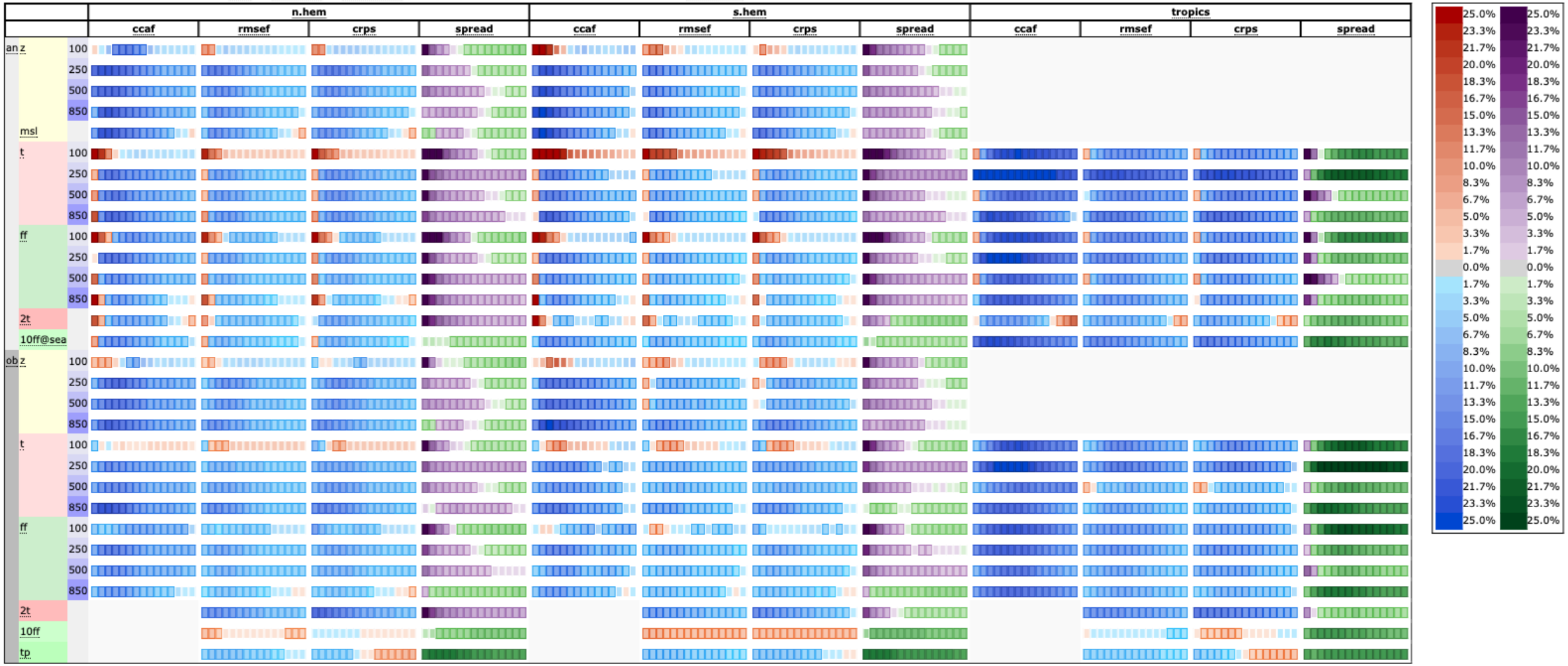
15-day forecasts, N320 (~ 0.25) resolution, 6 hourly output



AIFS ENS 1 vs IFS scorecard

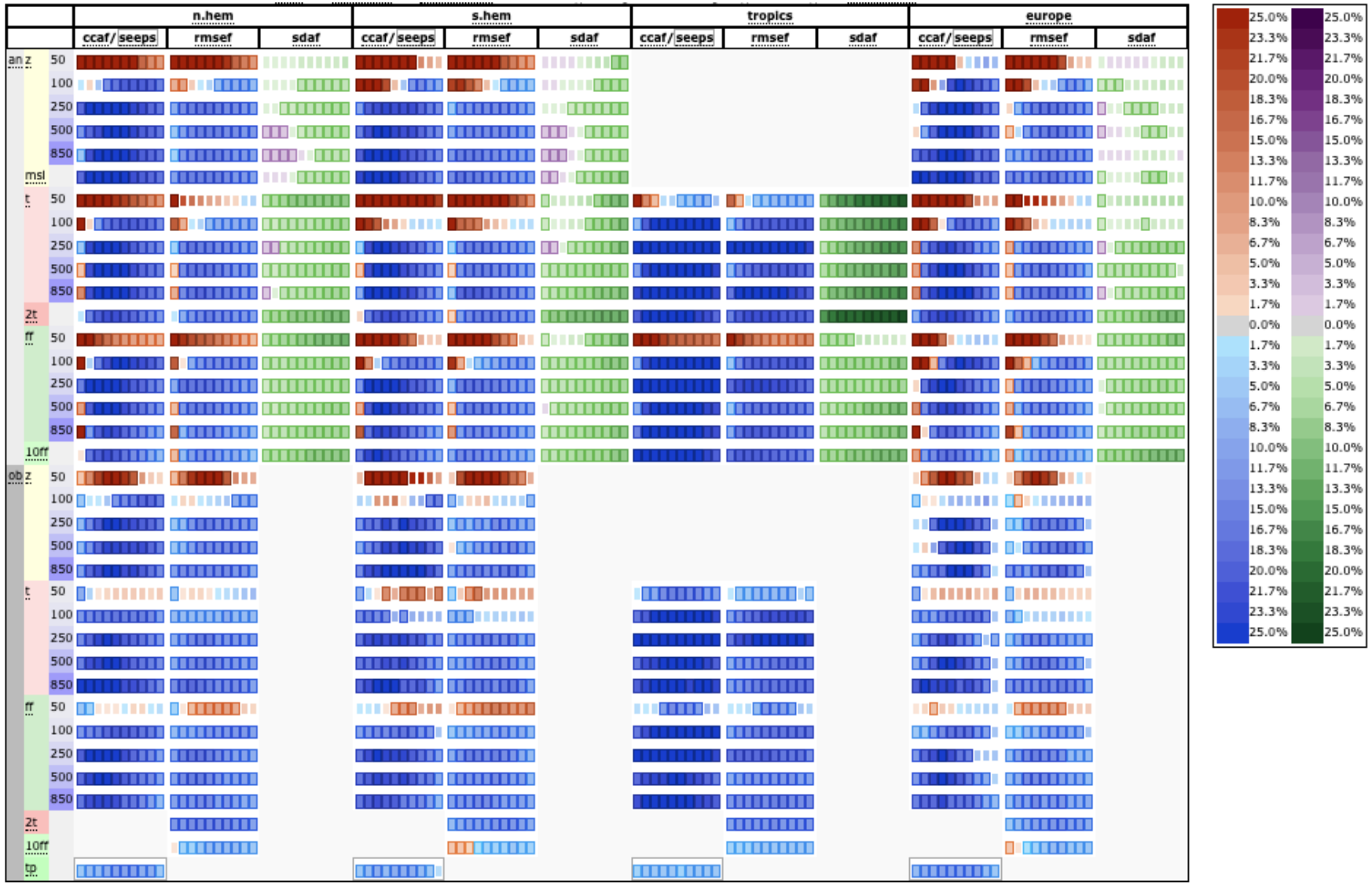
https://sites.ecmwf.int/aifs/scorecards/aifs_ens_1.html

dates=[2024-03-01 00:00:00,2024-03-01 12:00:00,2024-03-02 00:00:00,...,2025-02-28 12:00:00,2025-03-01 00:00:00]
steps=[24, 48, 72, 96, 120, 144, 168, 192, 216, 240, 264, 288, 312, 336, 360]



More on AI model verification in the next webinar session.

AIFS vs IFS 2024



- Better performance overall for AIFS
- Less forecast activity (smoothing)
- Issues in the stratosphere
- Scores tend to be worse for short lead times 1D

ECMWF

Where are we?

- For headline scores, data-driven models are best.
- AIFS-Single does not represent spatial scales correctly.
  - The different training strategy used in AIFS-CRPS allows to solve this issue.
- Extreme events
  - AIFS Single underpredicts extreme events but still useful. AIFS CRPS and IFS-ENS similar scores

Future improvements

- New **wave variables**, **higher model top** and **more recent data** used for training for even better scores. AIFS v2 coming at the beginning of 2026 together with the release of 50r1
- Forecast artifacts significantly improved in AIFS-CRPS v2.
- Higher temporal resolution
- Higher resolution models (9km) in development.
- Ocean variables.

Webinar 1 - Discover Machine Learning Models for Operational Forecasters

- Introduction (Becky)
  - What ECMWF machine learning models are available
  - Basic information on models and accessing them
- The machine learning models (Gabriel)
  - Basics of how a machine model works
  - Differences between AIFS Single v1 and AIFS ENS v1
  - Future Plans
- Demonstration of accessing machine model forecasts (Milana)
  - How to access via ecCharts and OpenCharts
  - Where to find more information

Please type questions in the chat – ECMWF colleagues are online to answer, we will also answer some at the end of the webinar

Your comments on your use of ML models are very welcome – we would like to better understand how you use them!

AIFS Single – graphical products

- 13 graphical products in Open charts

Home / Charts catalogue

Search products...

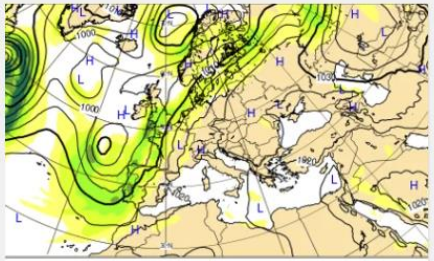
Range
- [ ] Medium (15 days)
- [ ] Sub-seasonal
- [ ] Seasonal

Type
- [x] Forecasts
- [ ] Verification

Component
- [ ] Surface
- [ ] Atmosphere

Product type
- [ ] Control Forecast (ex-HRES)
- [ ] Ensemble forecast (ENS)
- [ ] Extreme forecast index
- [ ] Point-based products
- [x] AIFS Single
- [ ] AIFS Ensemble forecast
- [ ] AIFS ENS Control
- [ ] Experimental: Machine learning models
- [ ] Atmospheric composition

Parameters
- [ ] Wind
- [ ] Mean sea level pressure



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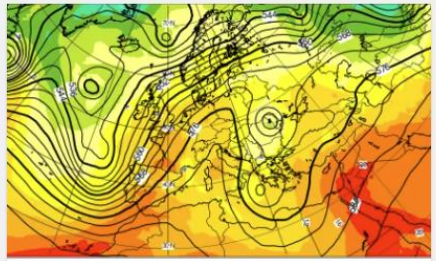

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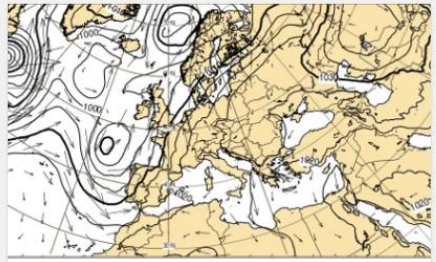

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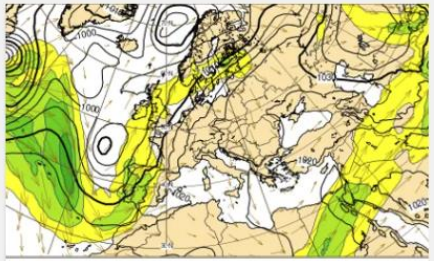

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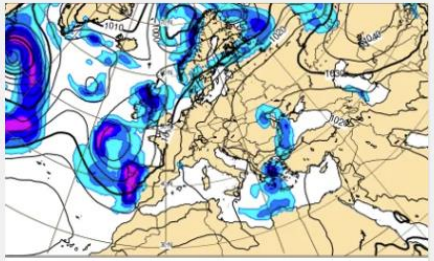

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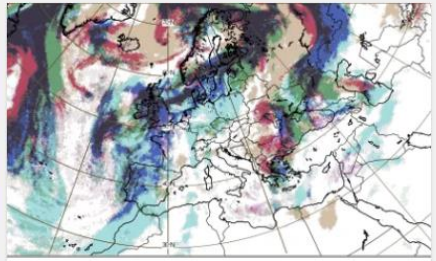

Latest forecast

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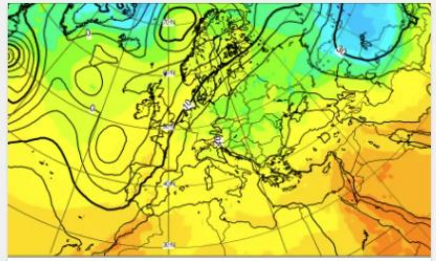

Latest forecast

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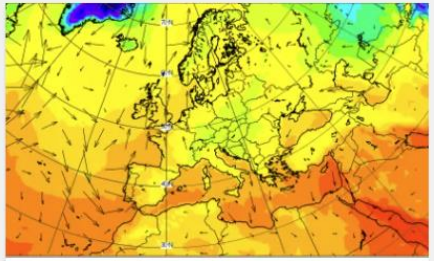

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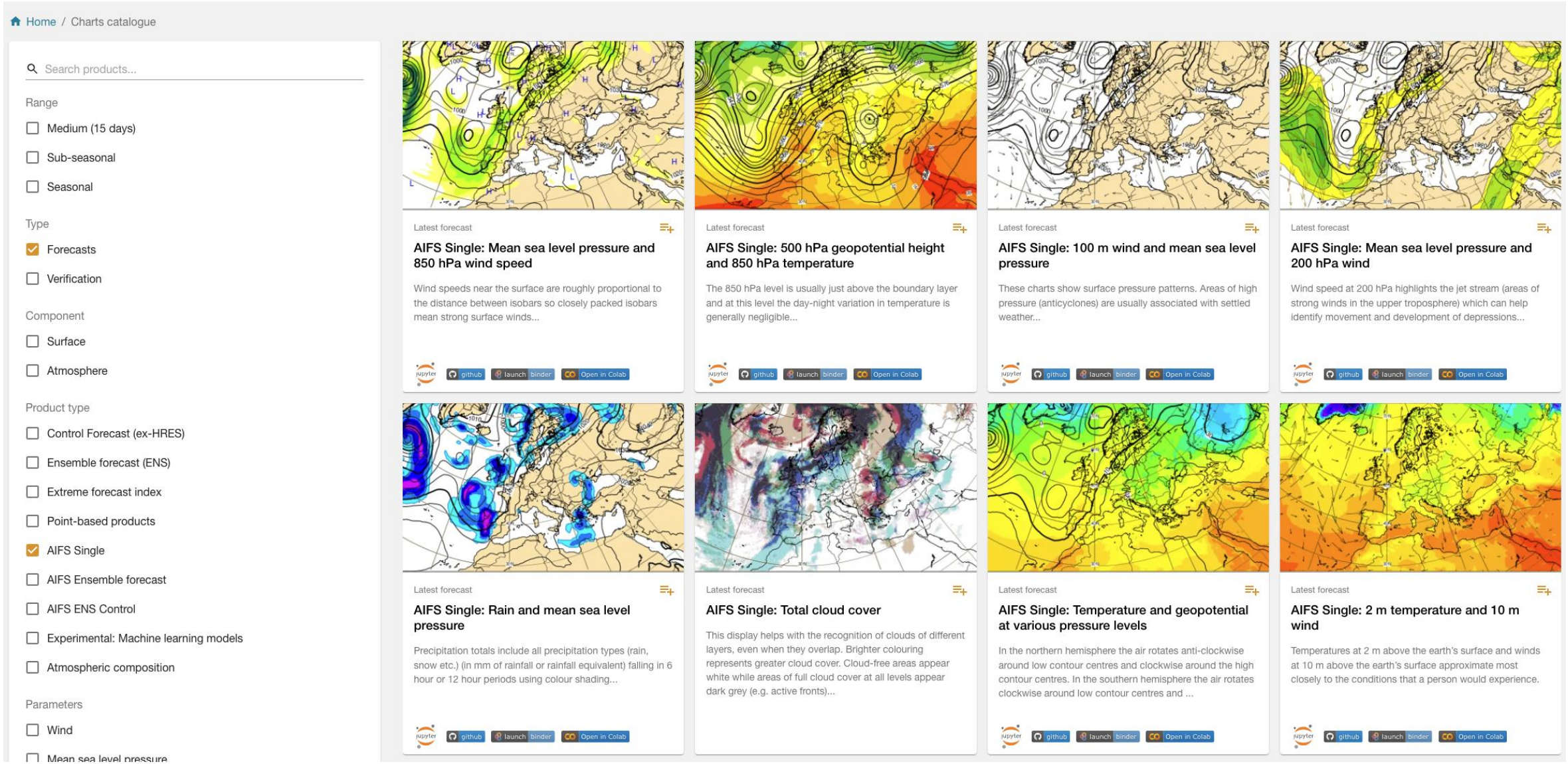
AIFS Single – graphical products

- How to find them? www.charts.ecmwf.int



AIFS Single – graphical products

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- [ ] Seasonal

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- [ ] Verification

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- [ ] Atmosphere

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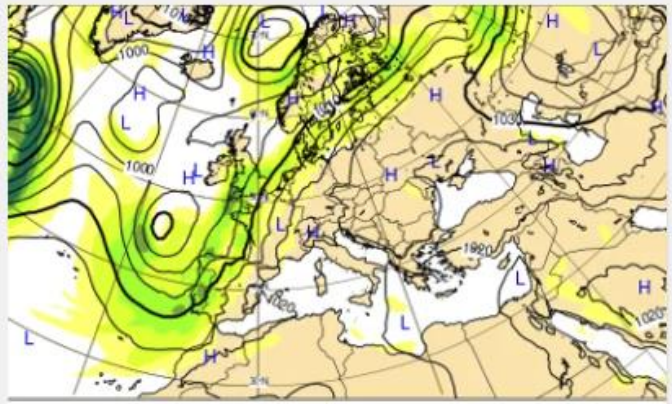
- [ ] Extreme forecast index
- [ ] Point-based products
- [x] AIFS Single



Latest forecast

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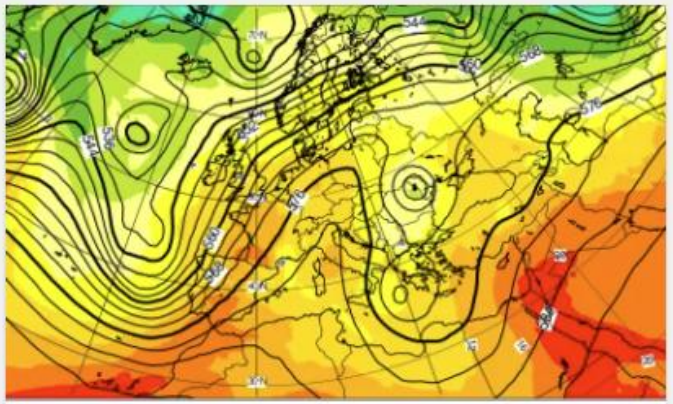
jupyter | github | launch binder | Open in Colab



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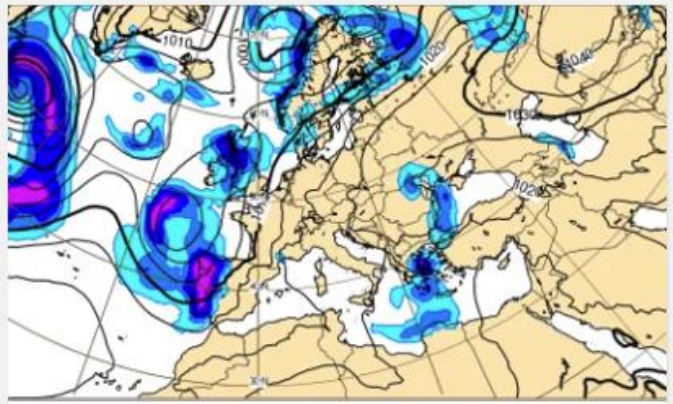
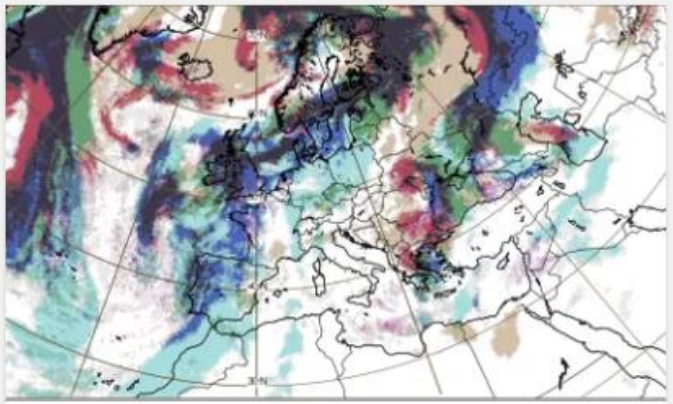
Latest forecast

AIFS Single pressure

These charts sh pressure (anticy weather...

jupyter | github



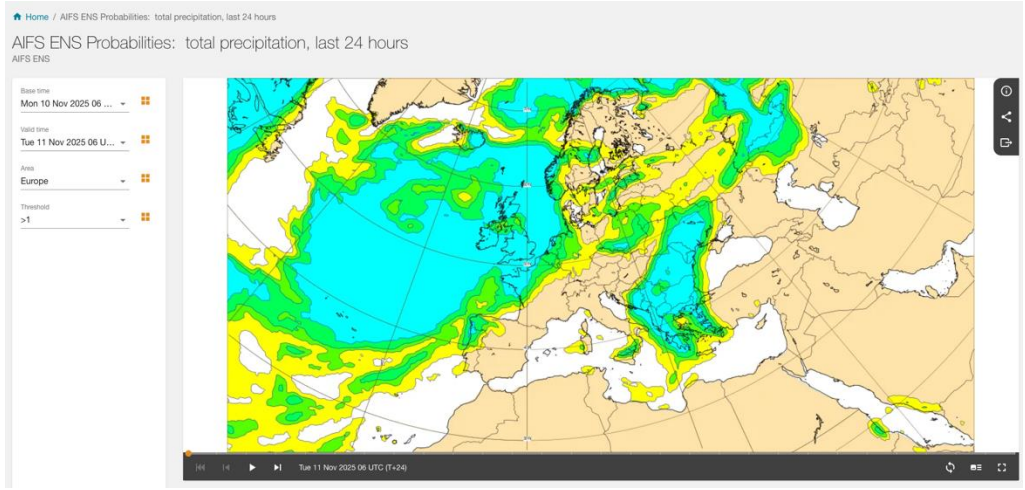


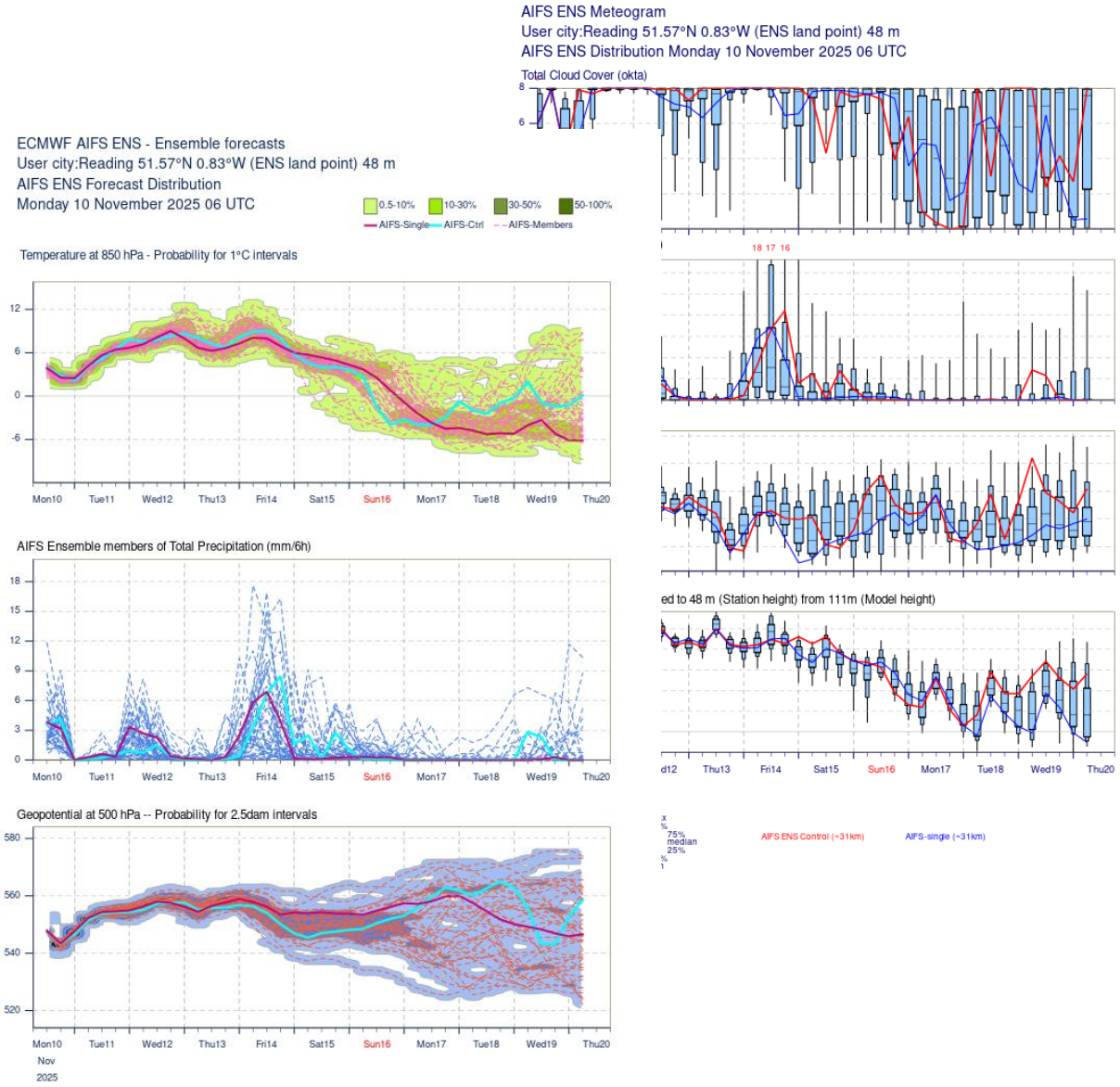
AIFS Ensemble – graphical products

www.charts.ecmwf.int

26 graphical products in Open charts:

- 13 with full ensemble:
  - Meteogram and plumes diagram,
  - 7 ensemble mean and spread,
  - 4 probabilities
- 13 graphical products from AIFS ENS Control





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- [ ] Extreme forecast index
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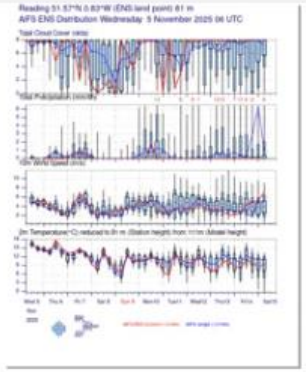
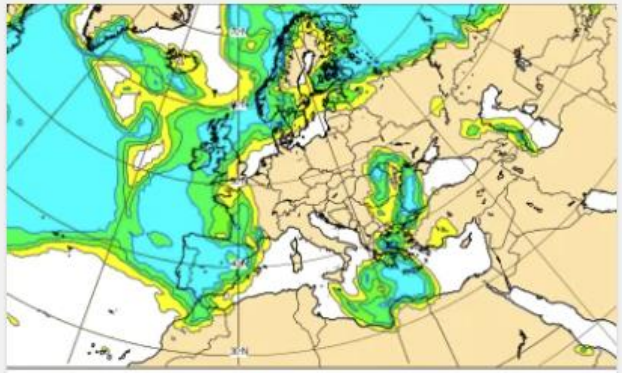
- [x] AIFS Ensemble forecast



Latest point-based forecast

AIFS ENS Meteograms

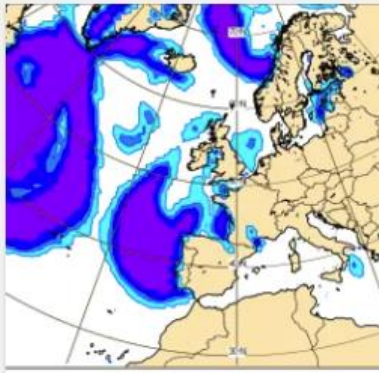
AIFS ENS Meteograms show a probabilistic interpretation of the AIFS ENS forecasts for specific locations using a box and whisker plot. It shows the time evolution of the distribution of several meteorological parameters on a single diagram...



Latest forecast

AIFS ENS Probabilities: total precipitation, last 24 hours

AIFS ENS: a deep learning-based system developed by ECMWF. It is initialised with ECMWF perturbed forecasts and operates at N320 (~0.25Deg) resolution



Latest forecast

AIFS ENS Probabilities: 10m

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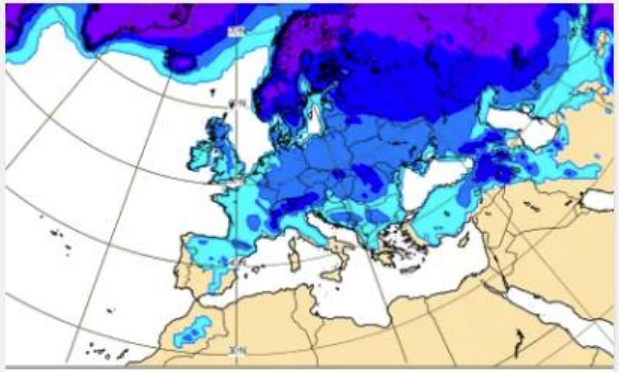
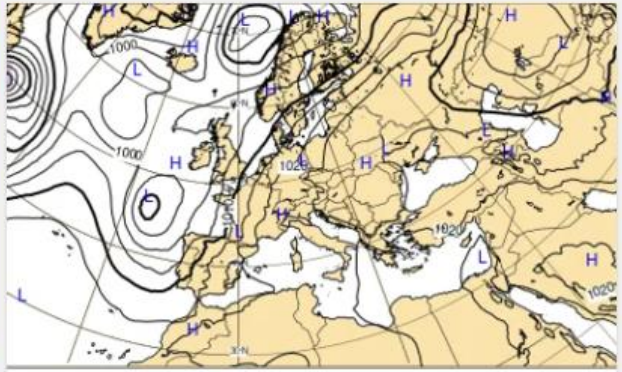


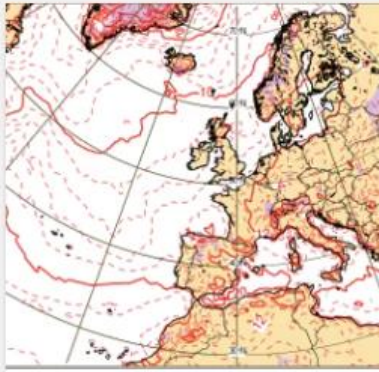
Latest forecast

AIFS ENS Probabilities: 2 m temperature < 0°C (day 10-15)



Latest forecast

AIFS ENS Ensemble mean and spread for mean sea level pressure



Latest forecast

AIFS ENS Ensemble mean a temperature

AIFS Ensemble – graphical products

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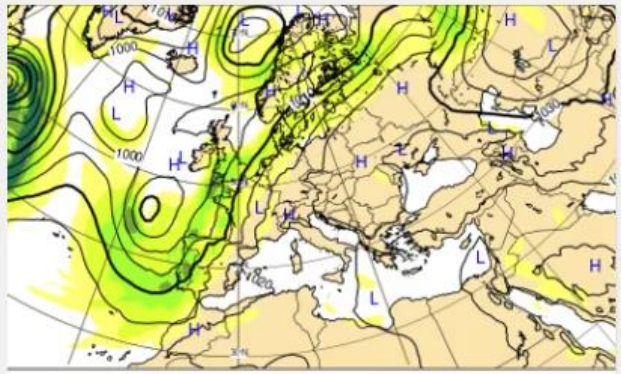
- [ ] AIFS Single
- [x] AIFS ENS Control



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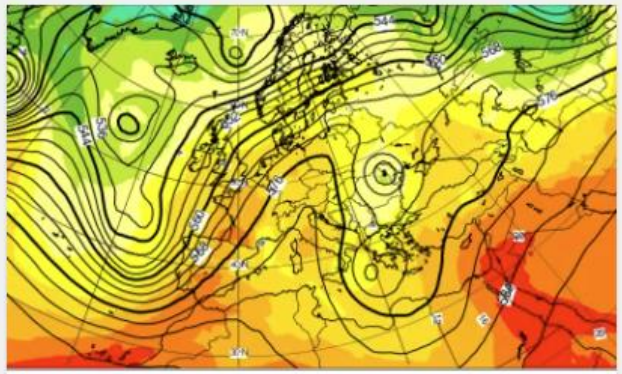

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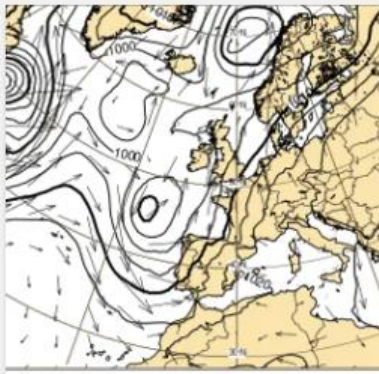

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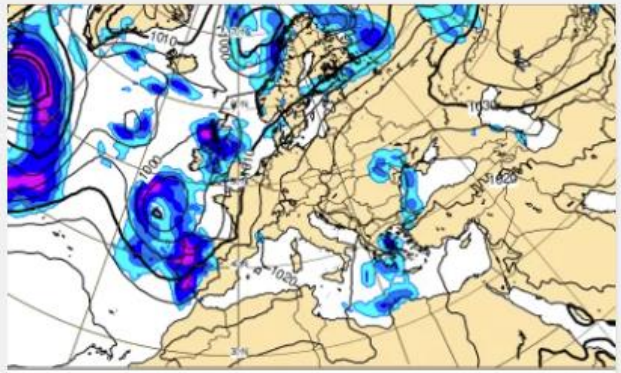
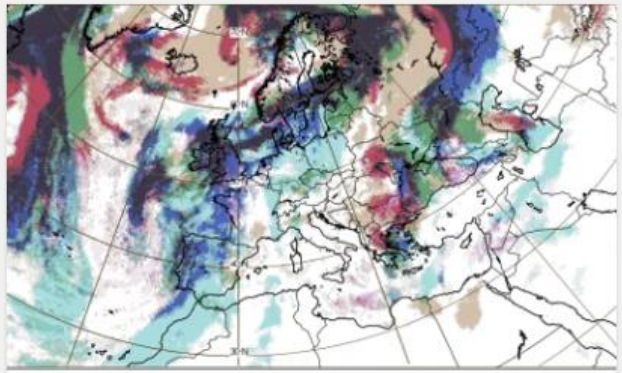


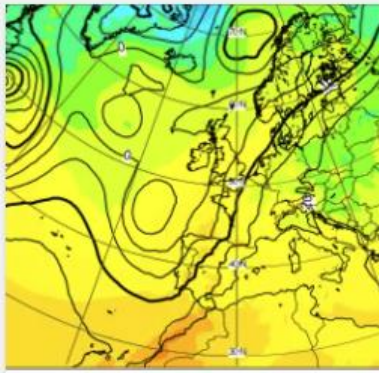
Latest forecast

AIFS ENS Control: Rain and mean sea level pressure



Latest forecast

AIFS ENS Control: Total cloud cover



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AIFS ENS Control: Temperat geopotential at various pres

Other Machine Learning models: experimental

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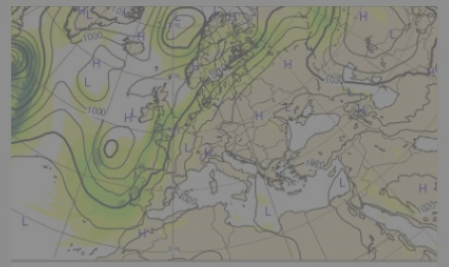

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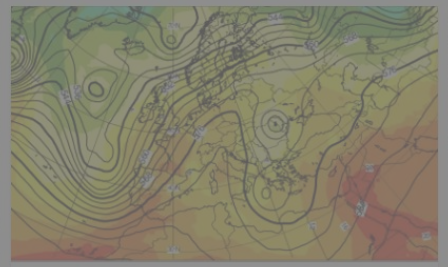

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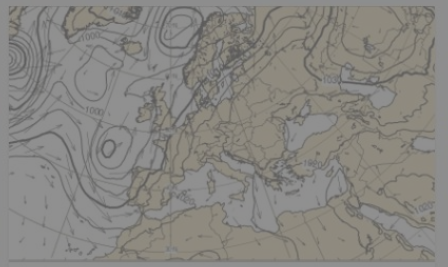

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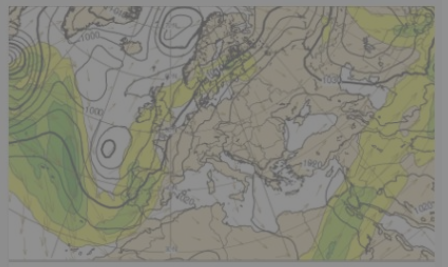

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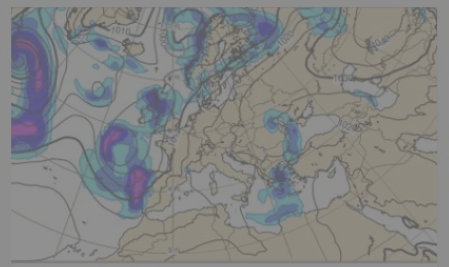

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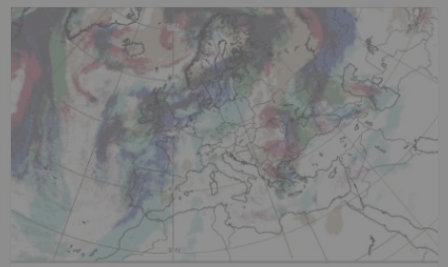

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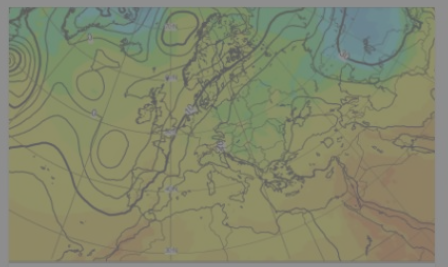

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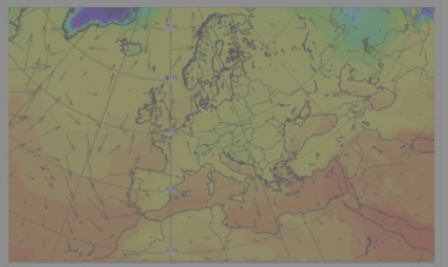

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Other Machine Learning models: experimental

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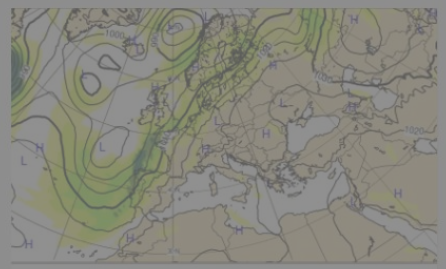
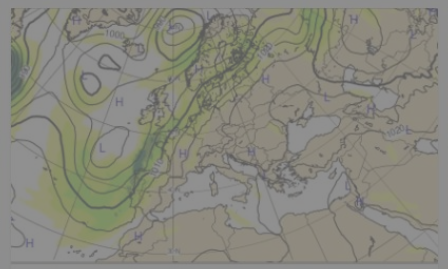


Latest forecast

Experimental: Aurora ML model: Mean sea level pressure and 850 hPa wind speed

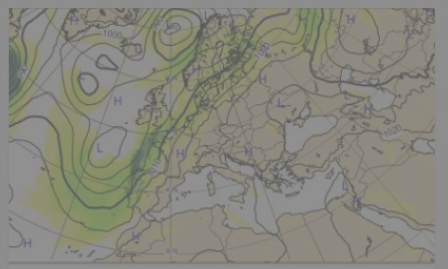
Aurora: a deep learning-based system developed by Microsoft. It is initialised with ECMWF analysis. Aurora operates at 0.1° resolution.



Latest forecast

Experimental: FourCastNet ML model: Mean sea level pressure and 850 hPa wind speed

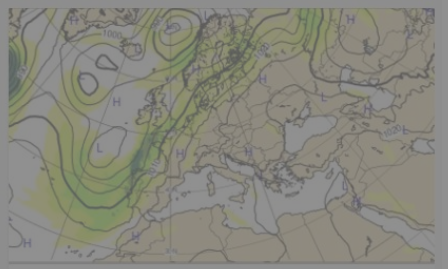
FourCastNet v2-small:a deep learning-based system developed by NVIDIA in collaboration with researchers at several US universities.It is initialised with ECMWF analysis. FourCastNet operates at 0.25° resolution.



Latest forecast

Experimental: GraphCast ML model: Mean sea level pressure and 850 hPa wind speed

GraphCast (Google DeepMind): a deep learning-based system developed by Google DeepMind.It is initialised with ECMWF analysis. GraphCast operates at 0.25° resolution.



Latest forecast

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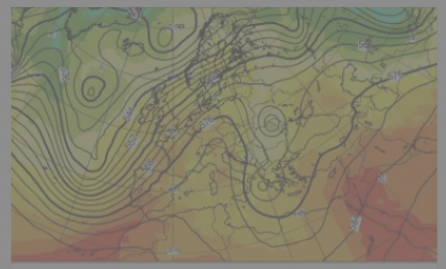

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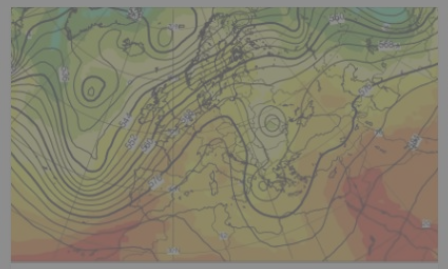

Latest forecast

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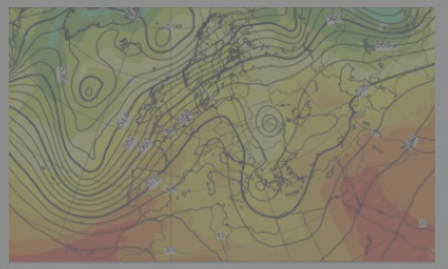

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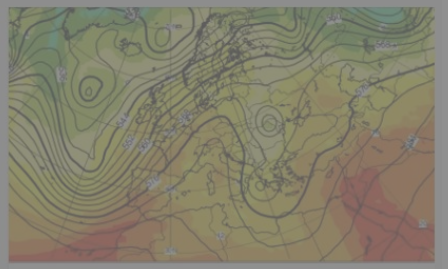

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Other Machine Learning models: experimental

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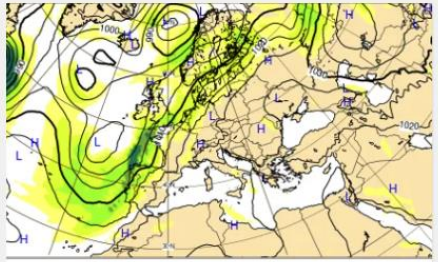
- Mean sea level pressure



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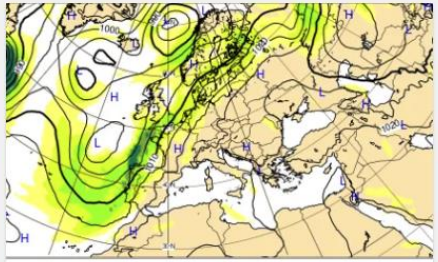

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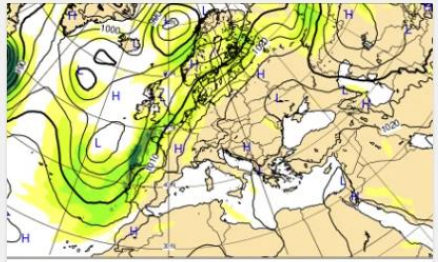

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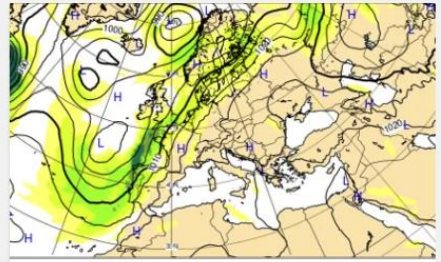

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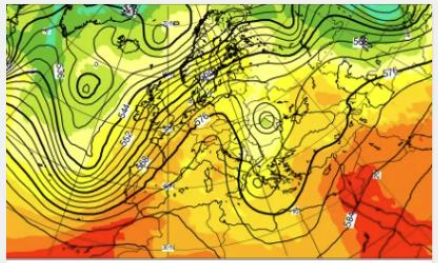

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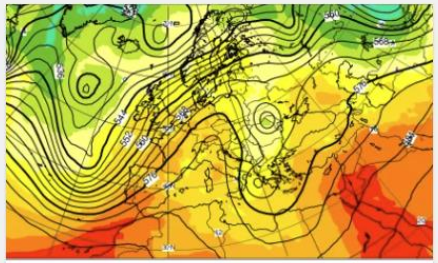

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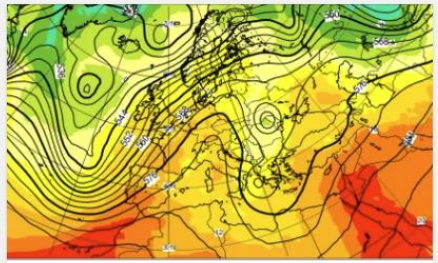

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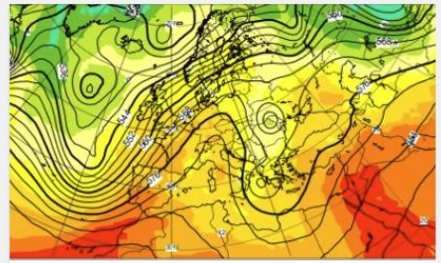

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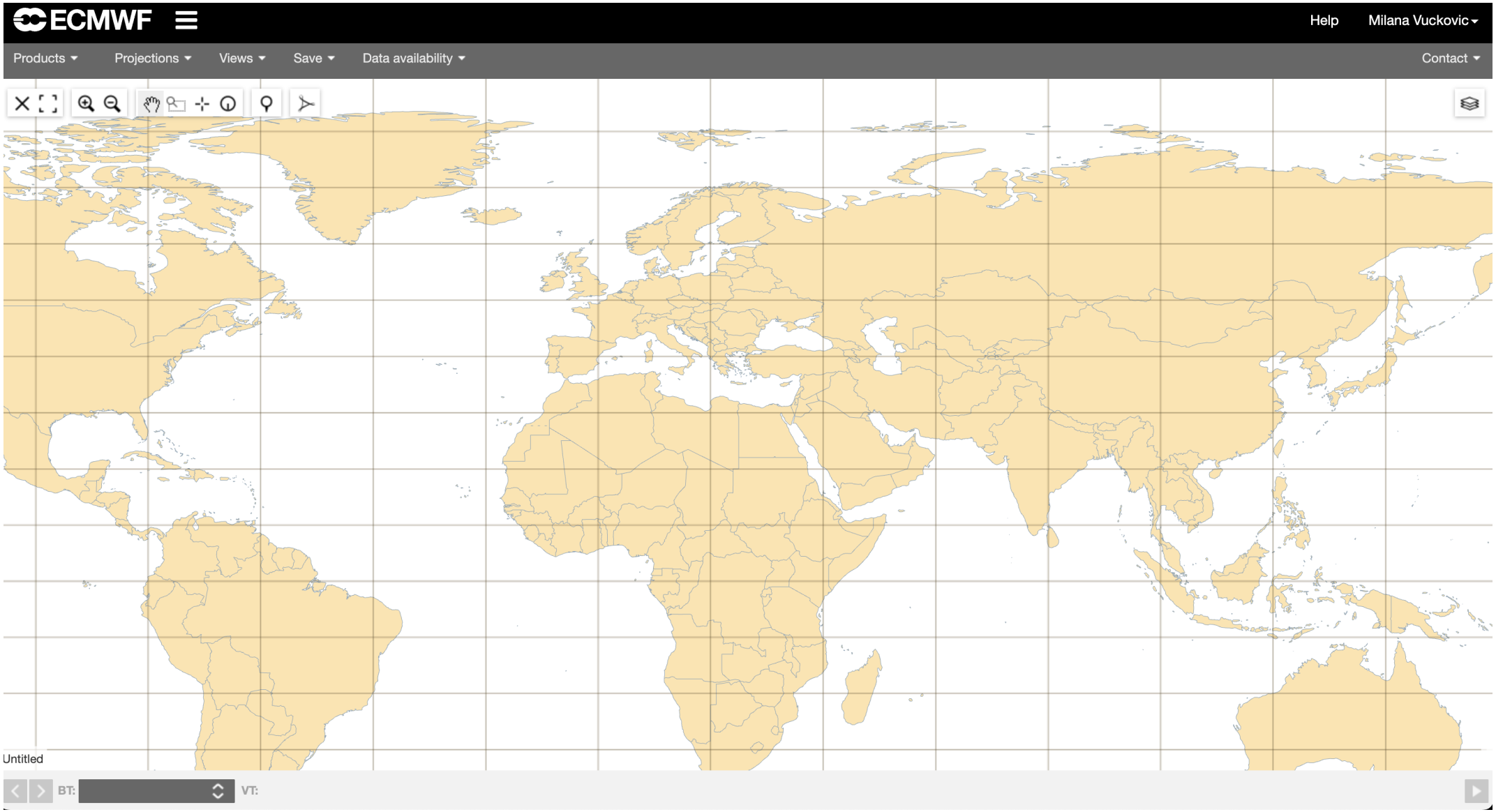

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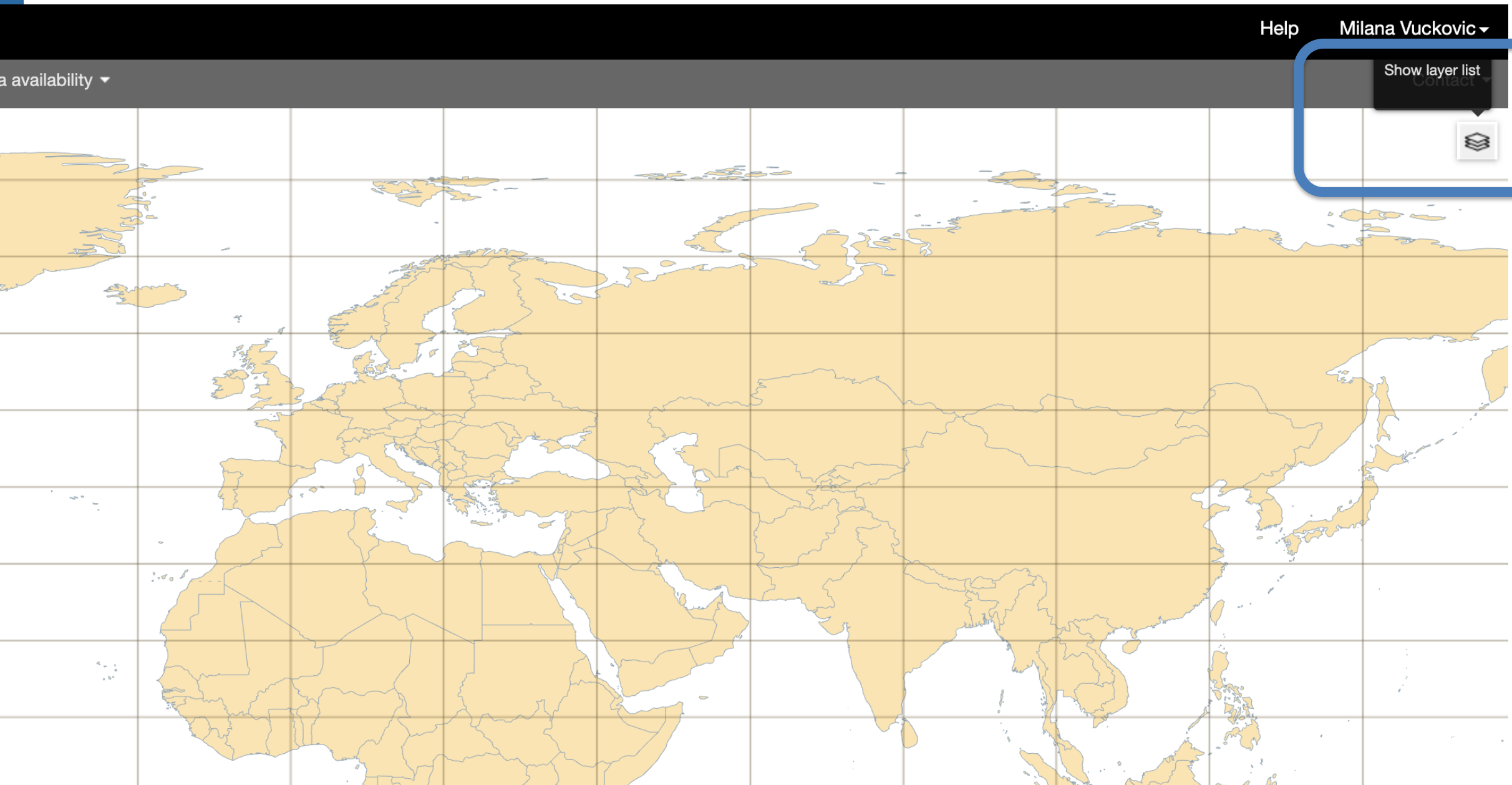

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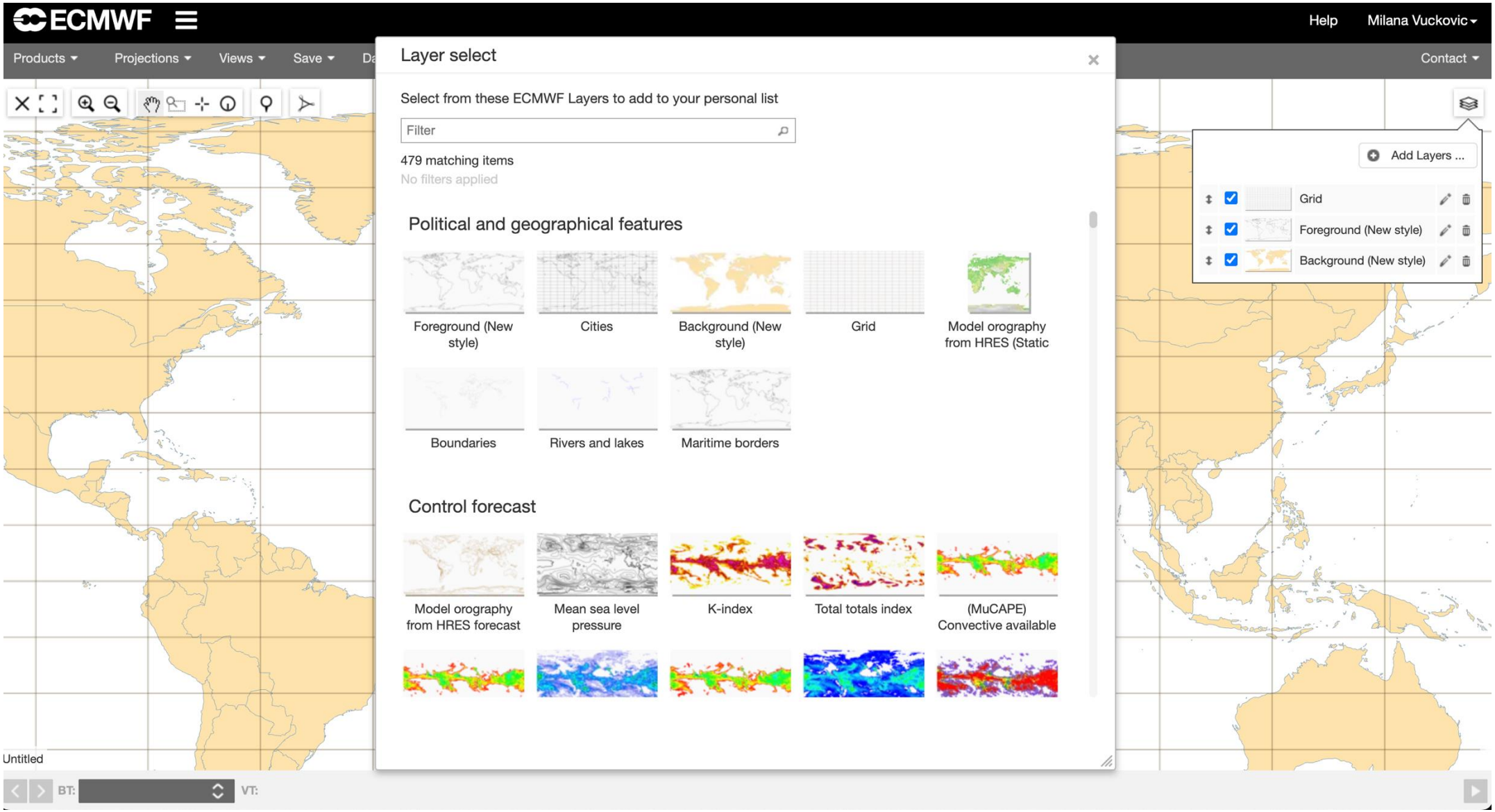

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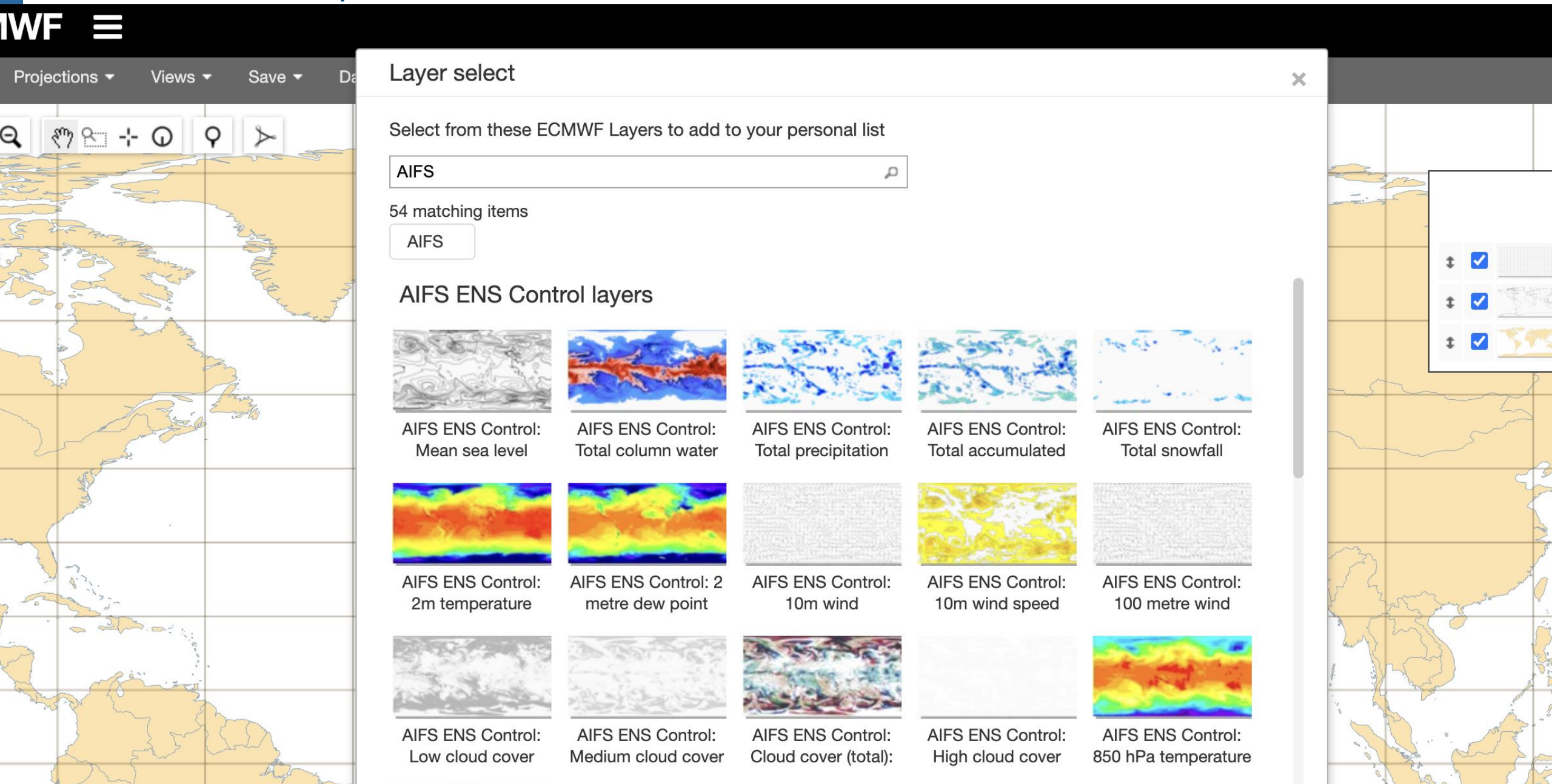

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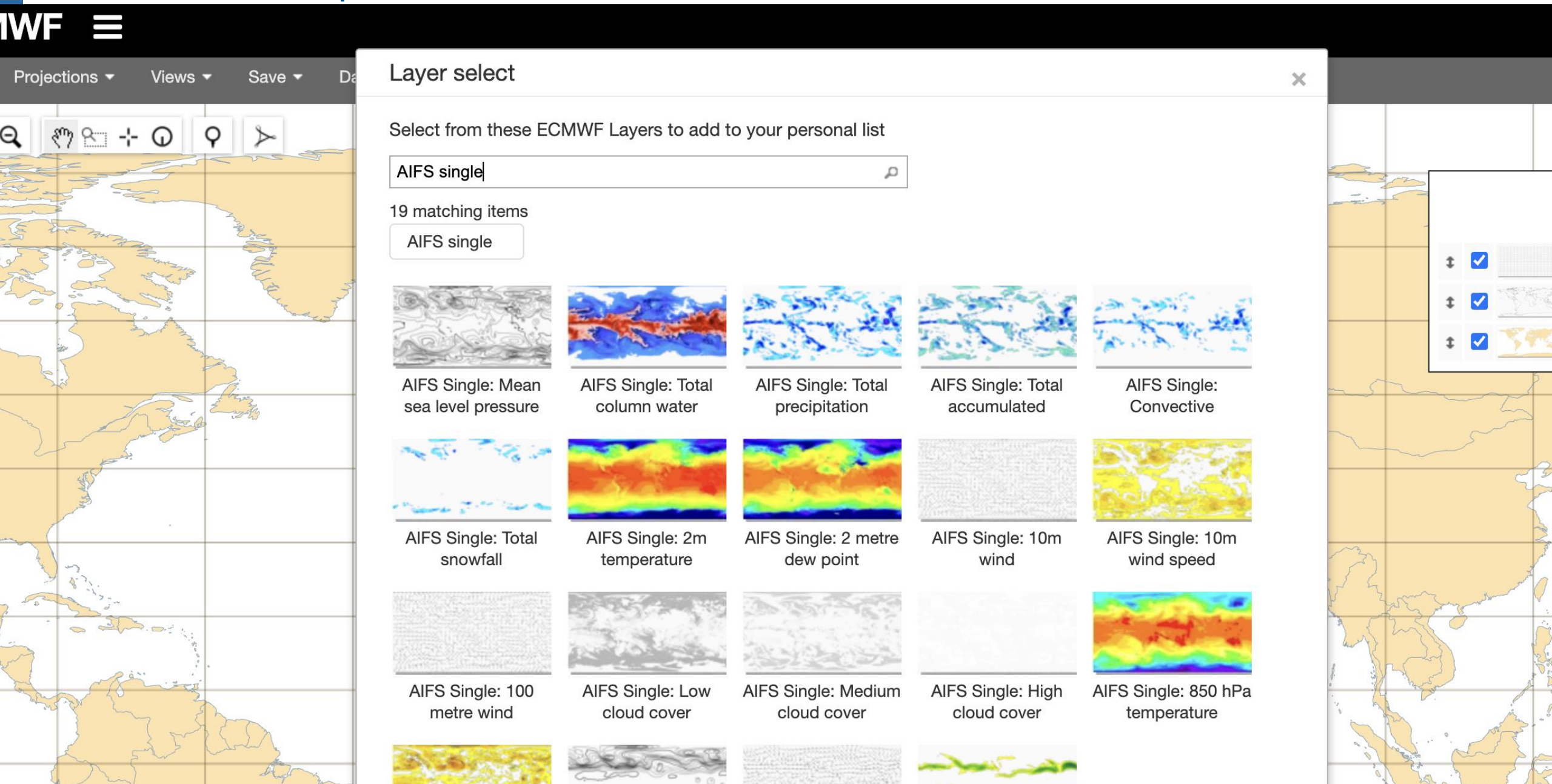

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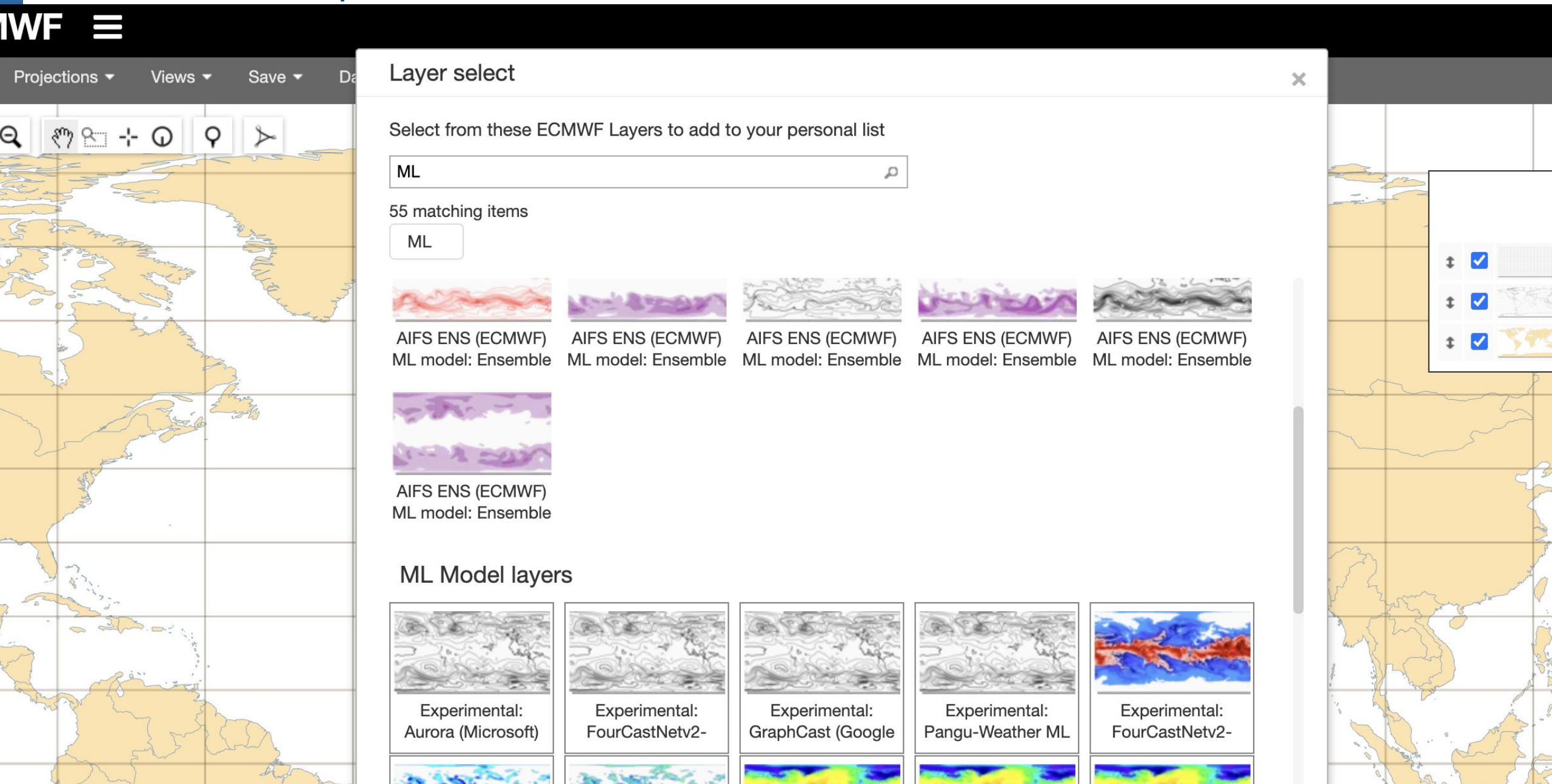

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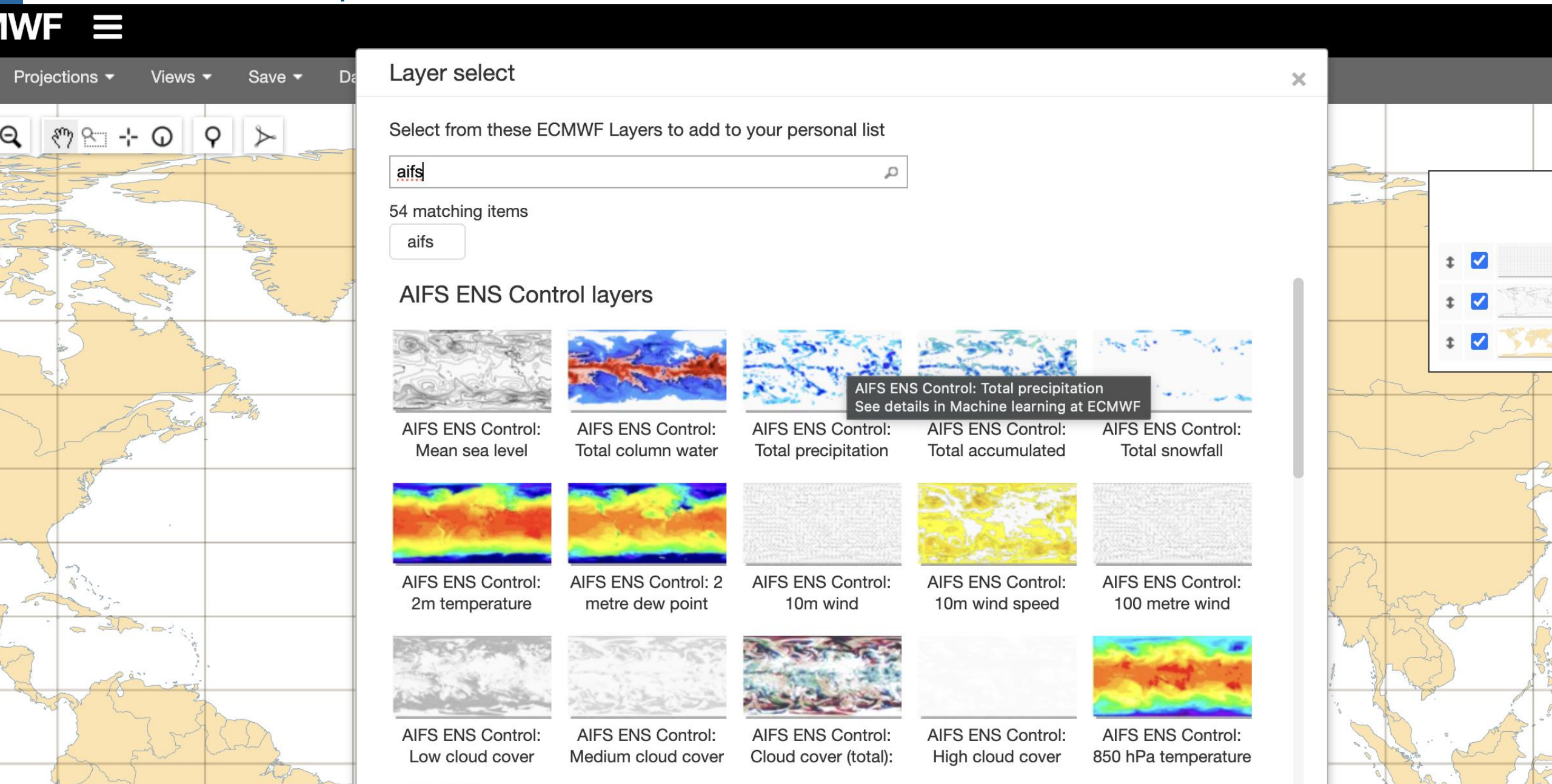

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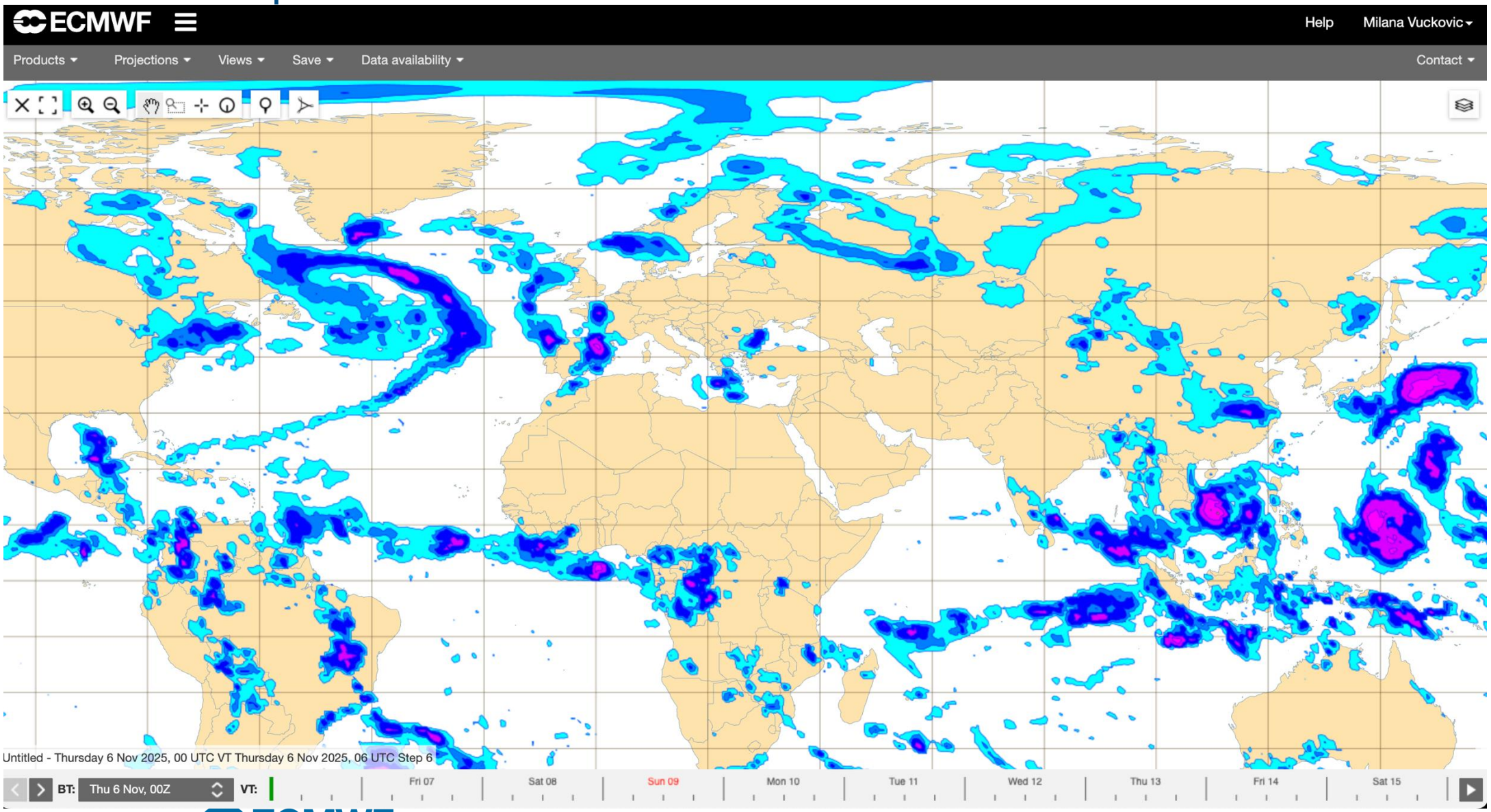

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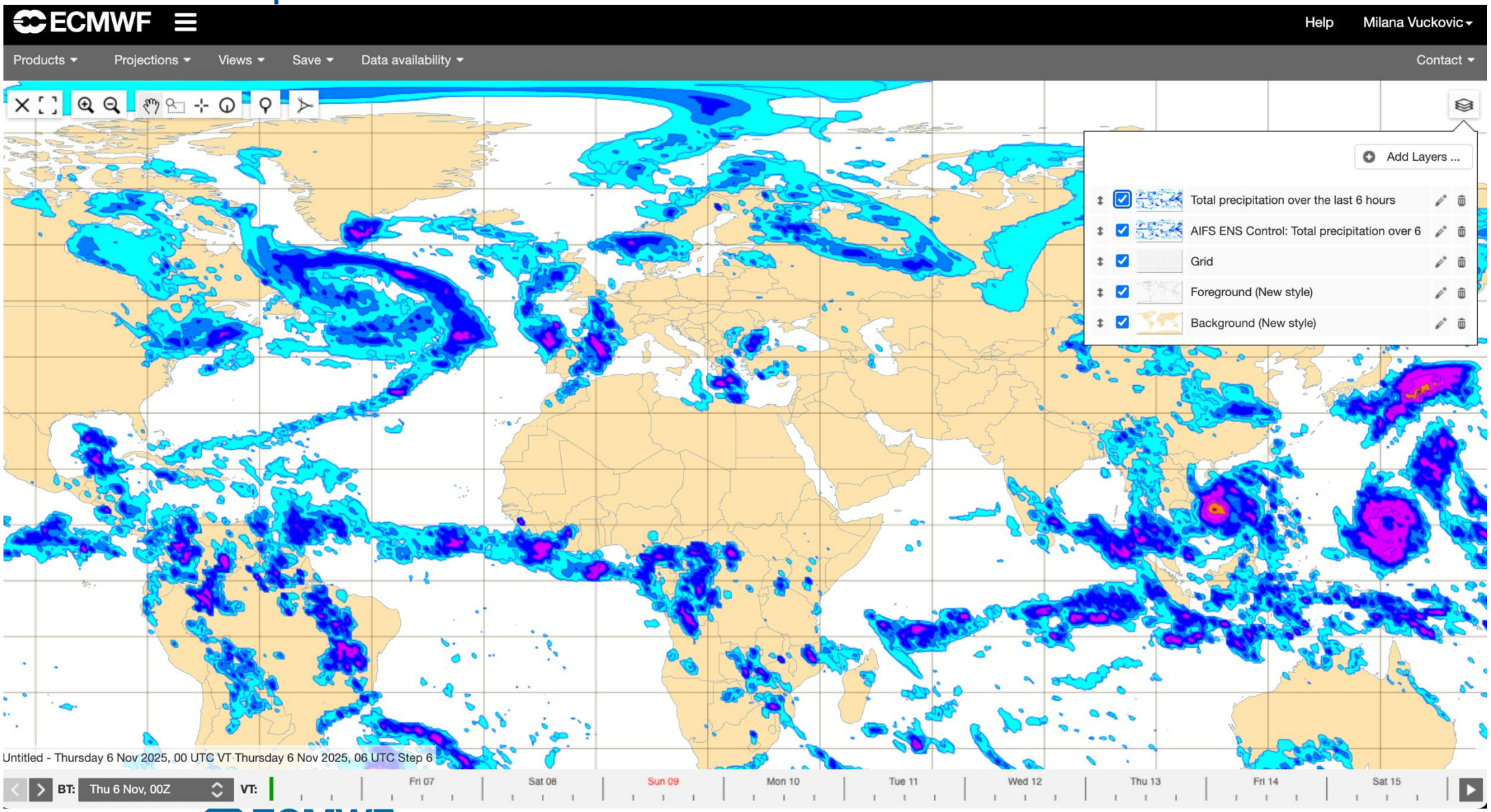

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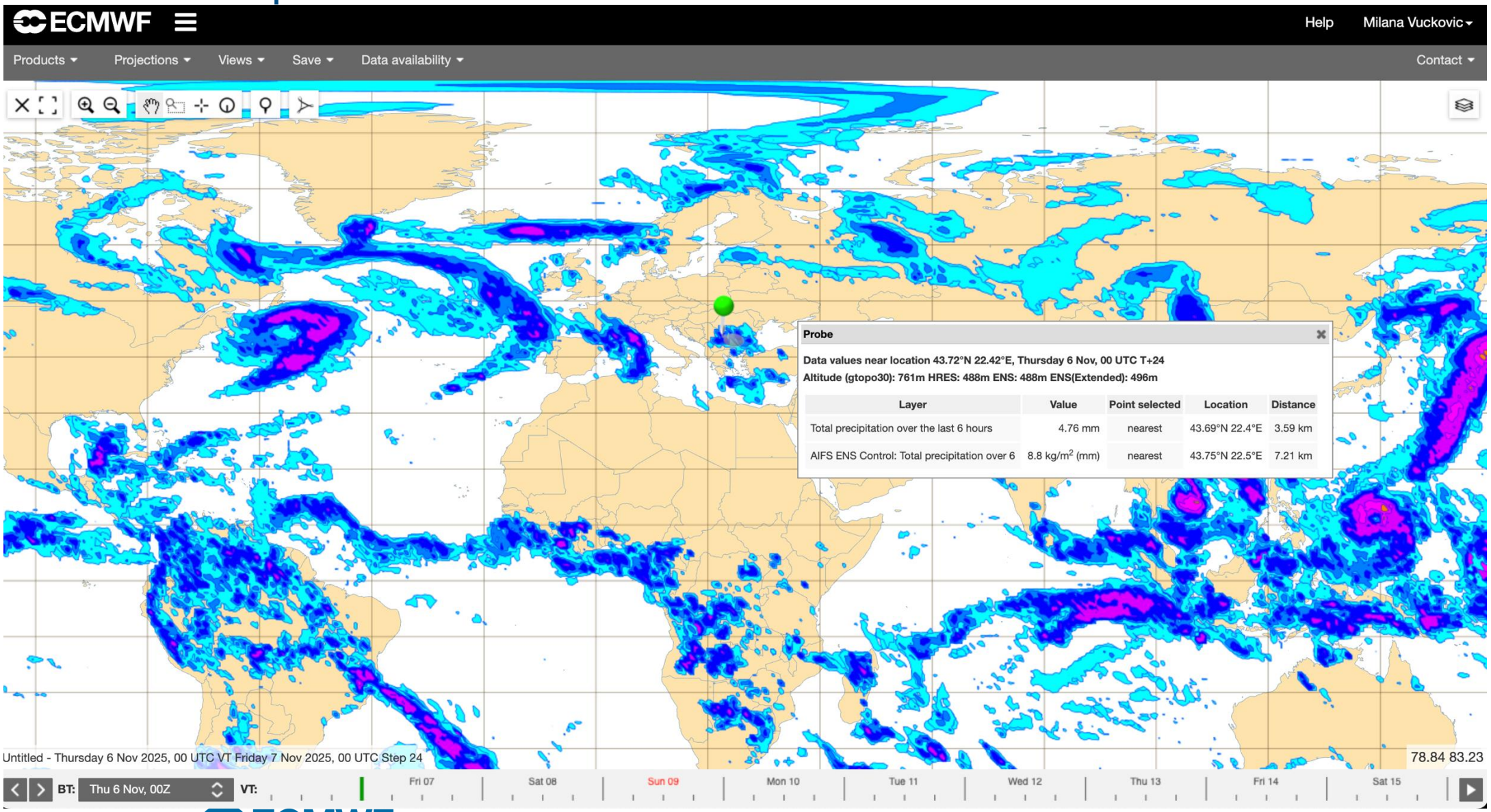

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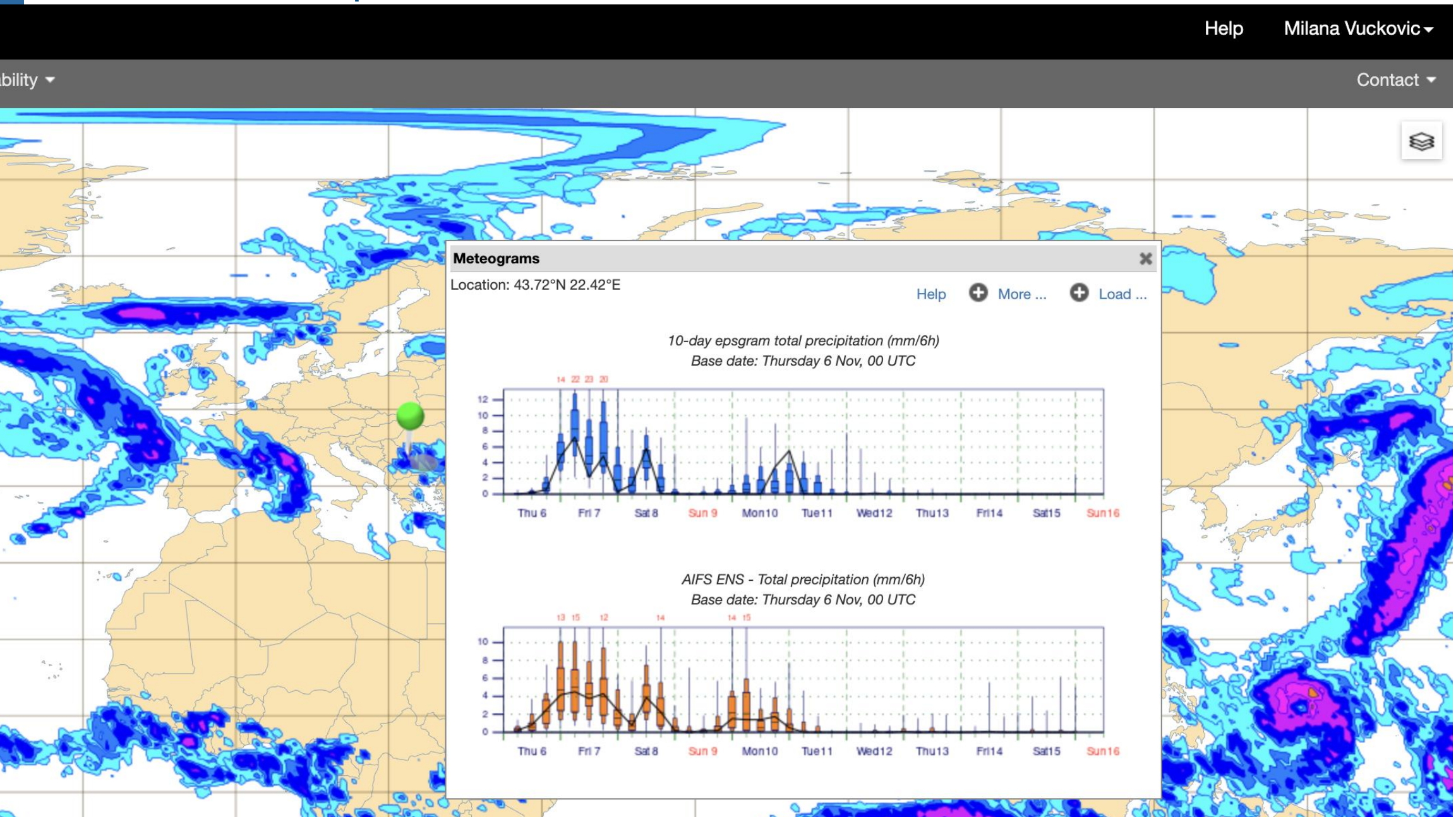

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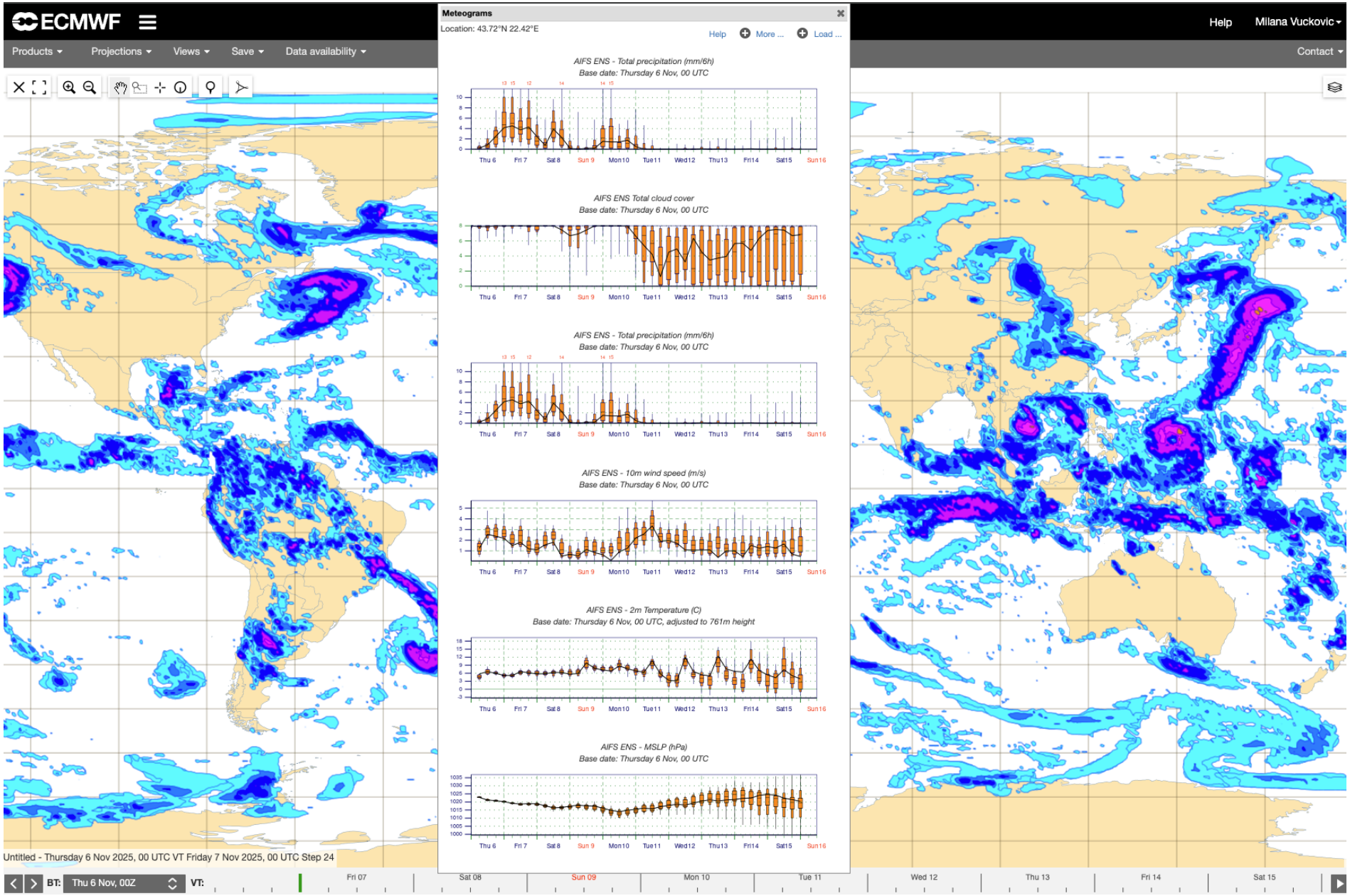
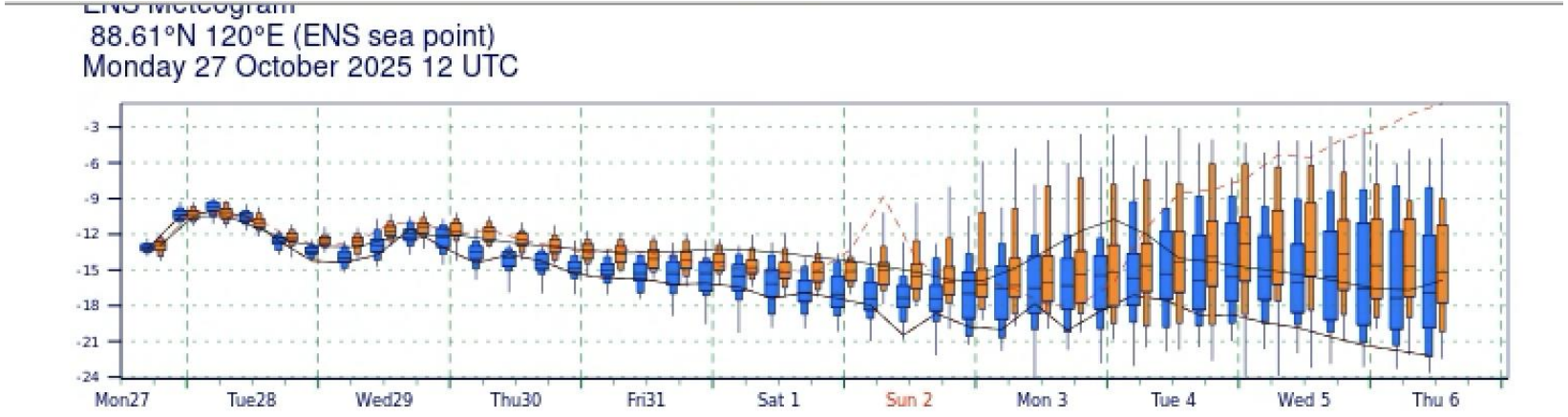


Coming soon!

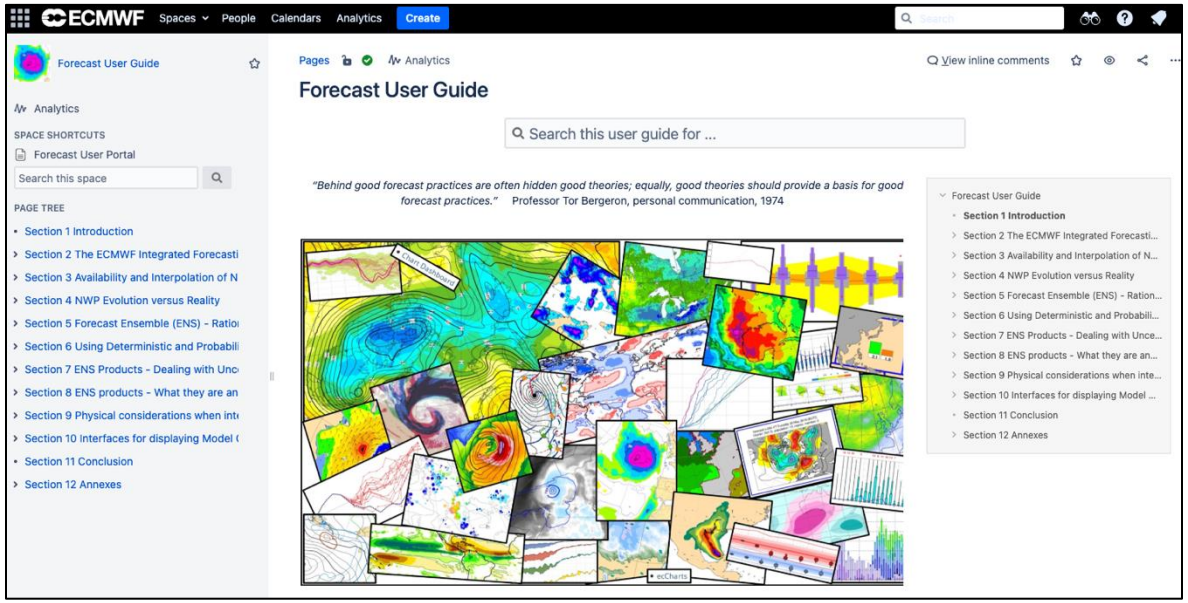
IFS & AIFS meteograms in one plot

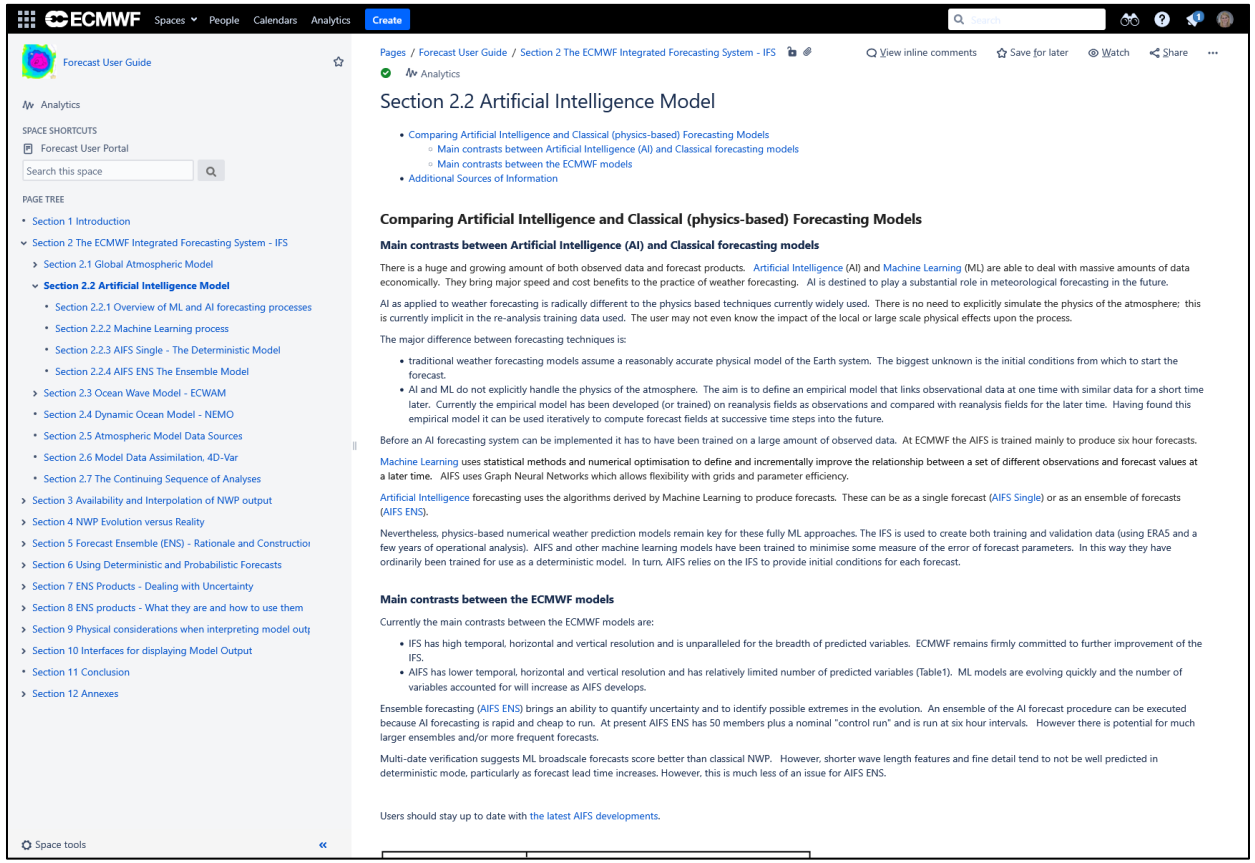


Where to find more information

Forecast User Guide: https://confluence.ecmwf.int/display/FUG/Forecast+User+Guide

New section: **Section 2.2 Artificial Intelligence Model**
https://confluence.ecmwf.int/display/FUG/Section+2.2+Artificial+Intelligence+Model





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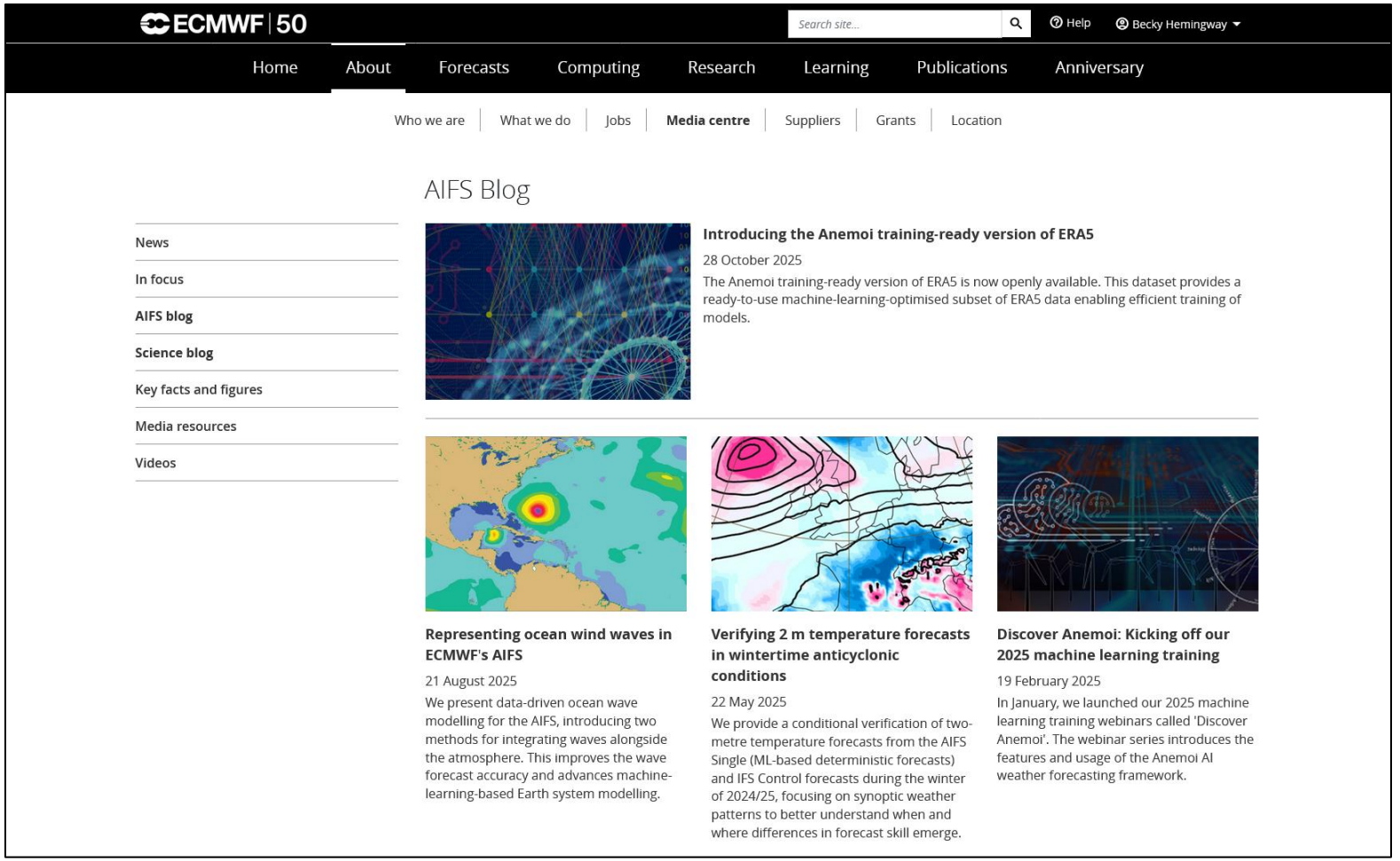
Where to find more information

AIFS Blog: https://www.ecmwf.int/en/about/media-centre/aifs-blog



Before we finish, a question for you

Which new graphical product using AIFS would you like to see?

Thank you for joining us today!

Questions?

Webinar 2 - What you need to be aware of when using ECMWF's Machine Learning models 18 November 2025, 10:00 - 11:00 UTC / 11:00 - 12:00 CET

Webinar 3 - Case Studies 25 November 2025, 14:00 - 15:00 UTC / 15:00 - 16:00 CET

Registration still open! https://events.ecmwf.int/event/493/