SARWeather

High-resolution & On-Demand
Weather Forecasts
for Search And Rescue

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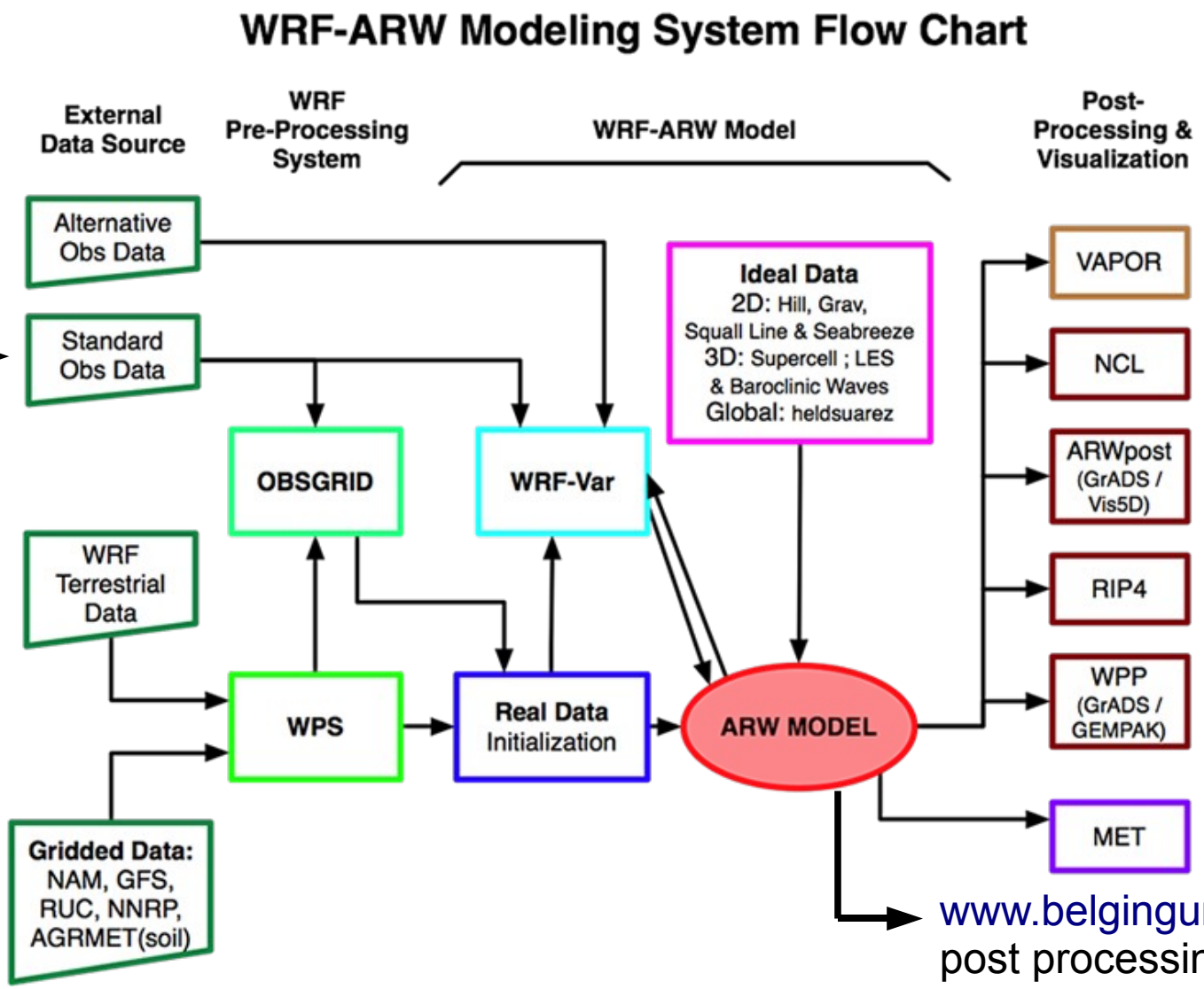
NORA
Nordisk Atlantsamarbejde

SEVENTH FRAMEWORK PROGRAMME

SARWeather

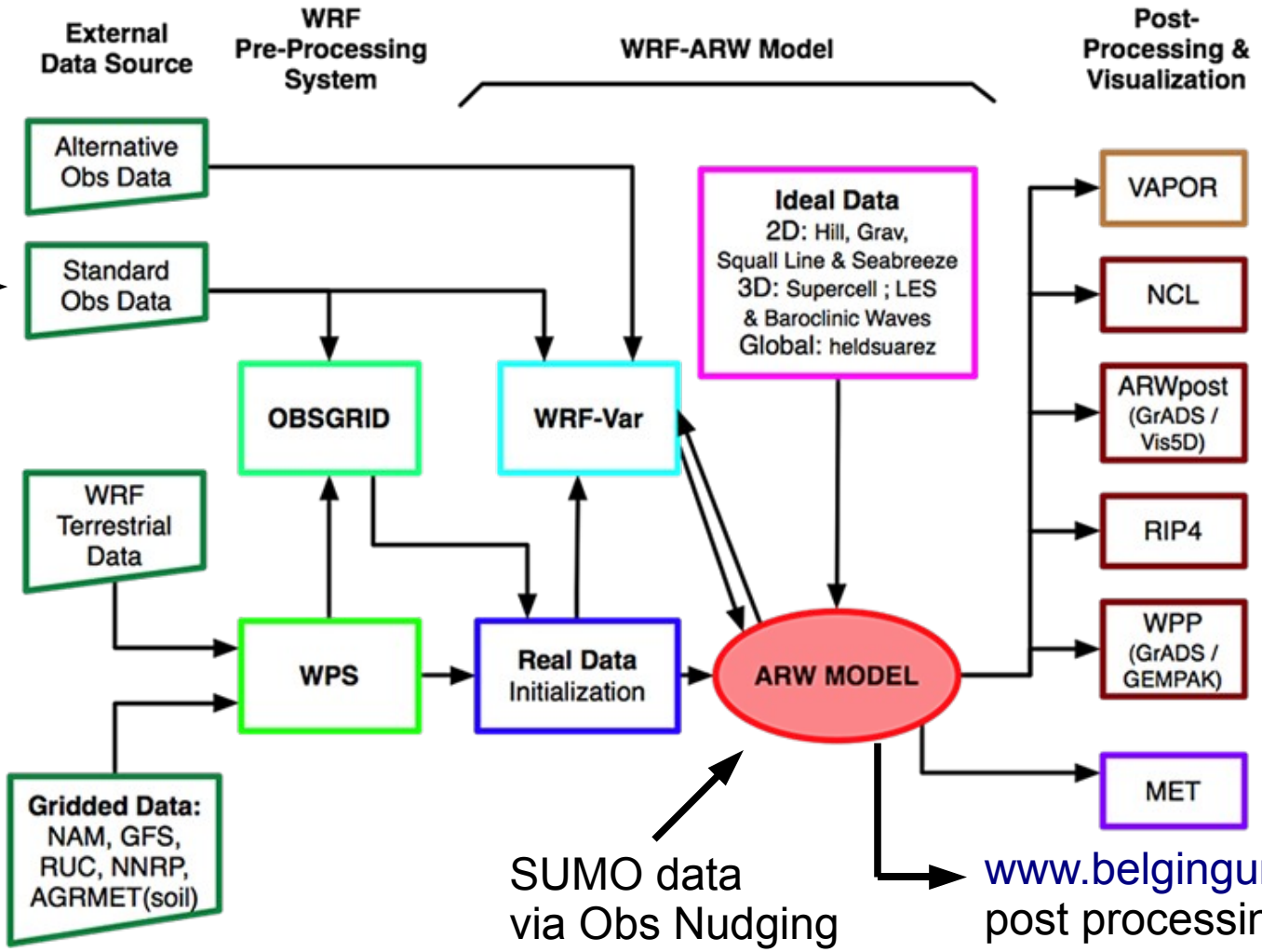
- WRF modeling system and SUMO
- V2 of the SUMO system
- In-flight data transmission
- Integration of SUMO data with SARWeather
- SARWeather on the cloud
- System schematics
- Demonstration of SARWeather
- On-going work and loose ends

SUMO data
3D-VAR or
4D-VAR



www.belgingur.is
post processing

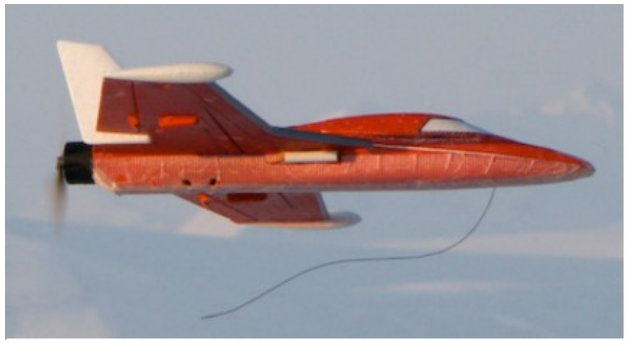
WRF-ARW Modeling System Flow Chart



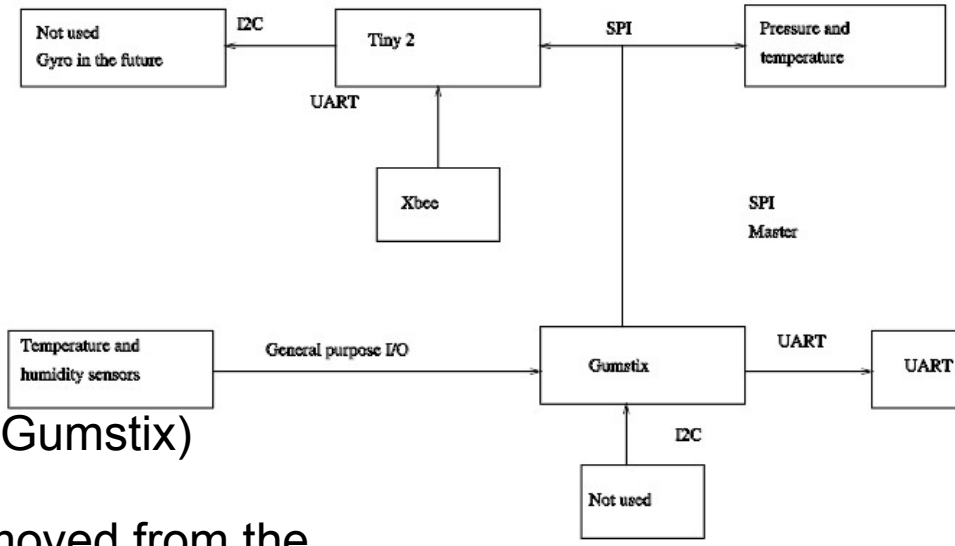
SUMO data
3D-VAR or
4D-VAR

SUMO data
via Obs Nudging

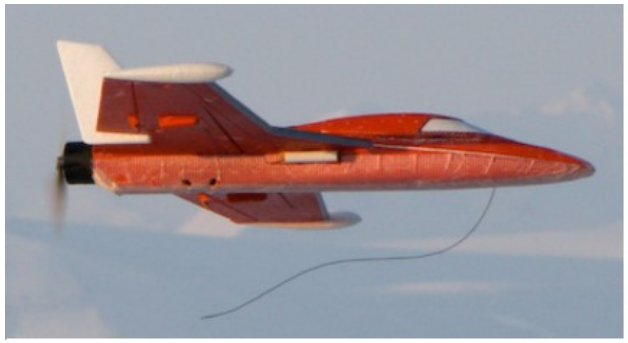
www.belgingur.is
post processing



Modifications done to the original SUMO plane



- New microcomputer (Gumstix)
- 3G/GSM modem
- All weather sensors moved from the original (Tiny2) microcomputer to the new one
- Opens up for two additional sensors to be connected to the Tiny2 (e.g. gyros for improved handling)



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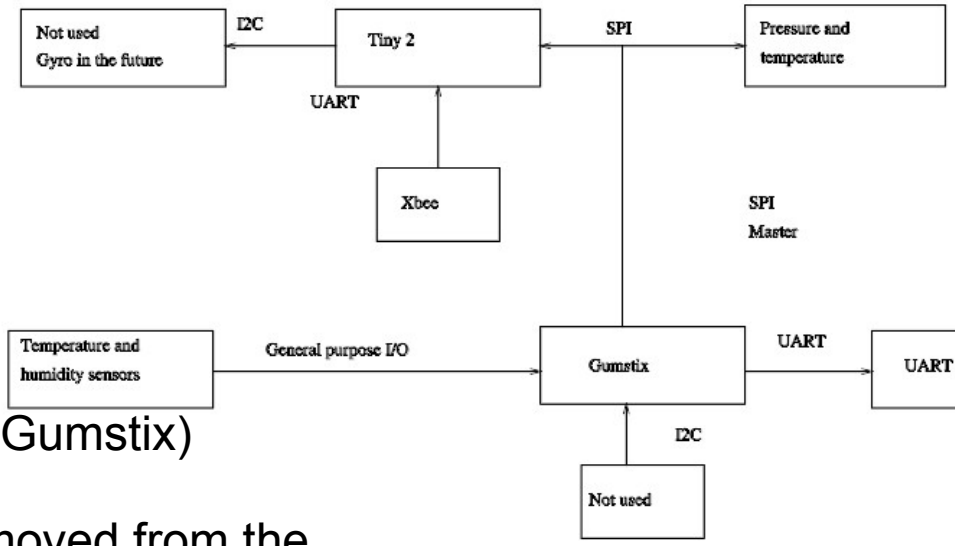

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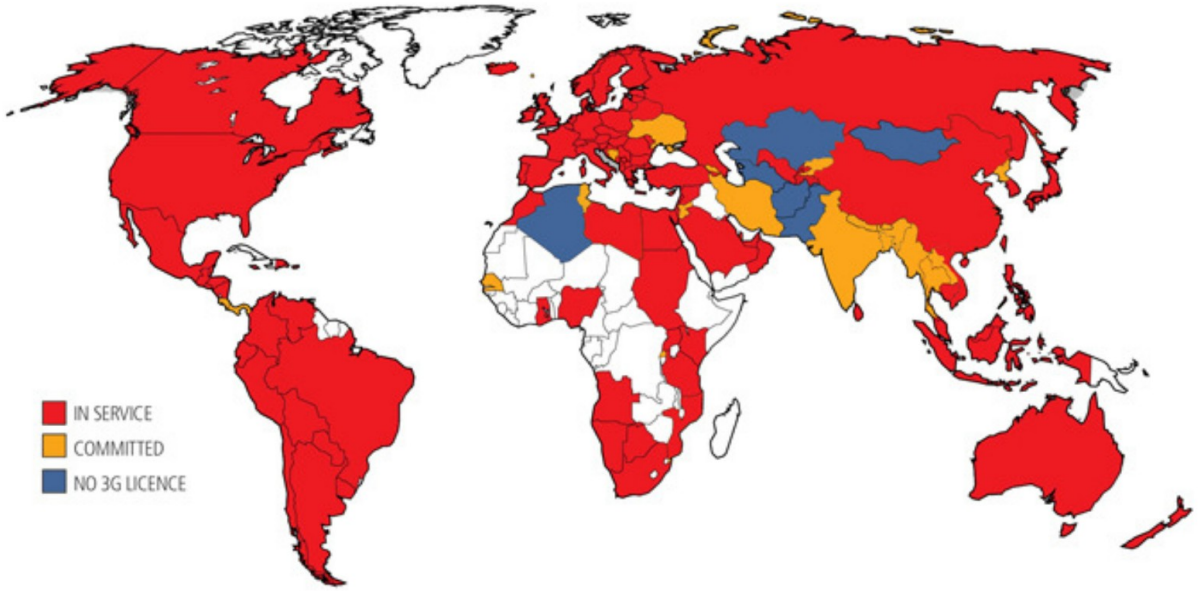
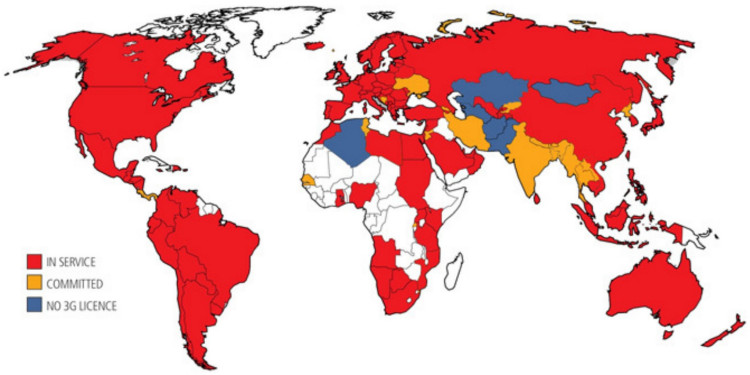
Data transmitted to data base

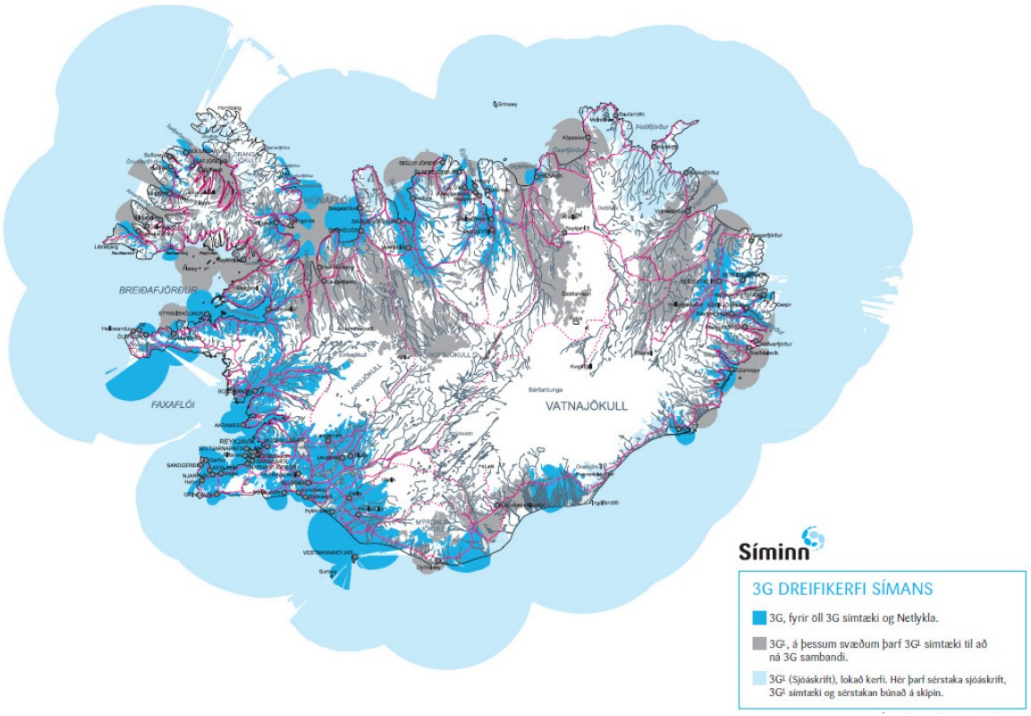
Also investigated the possibility of Iridium
- To power consuming and to heavy for the SUMO
- Could however be an option for a larger, more powerful plane



Current and near future coverage of the 3G system

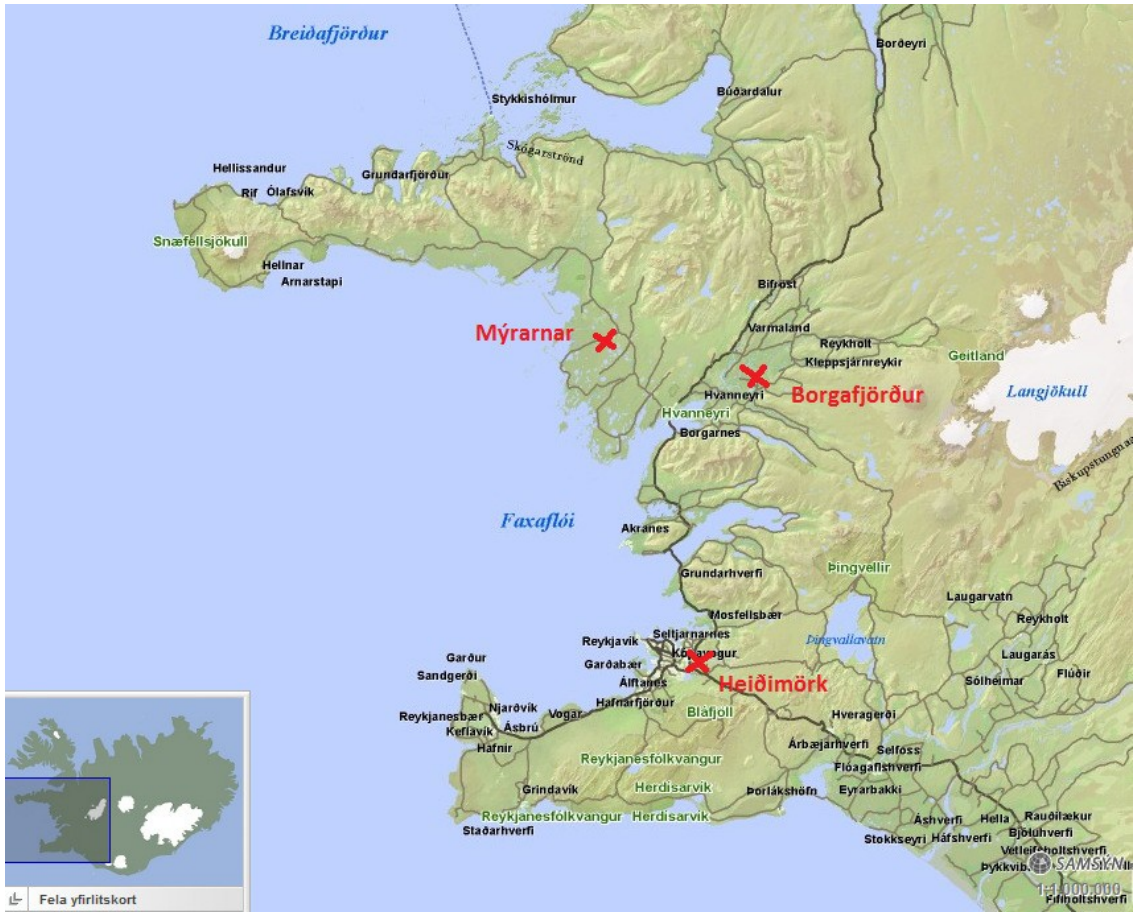
Current and near future coverage of the 3G system





Note that even if country is marked red it does not mean total 3G coverage

Test flights to investigate the 3G/GSM connection



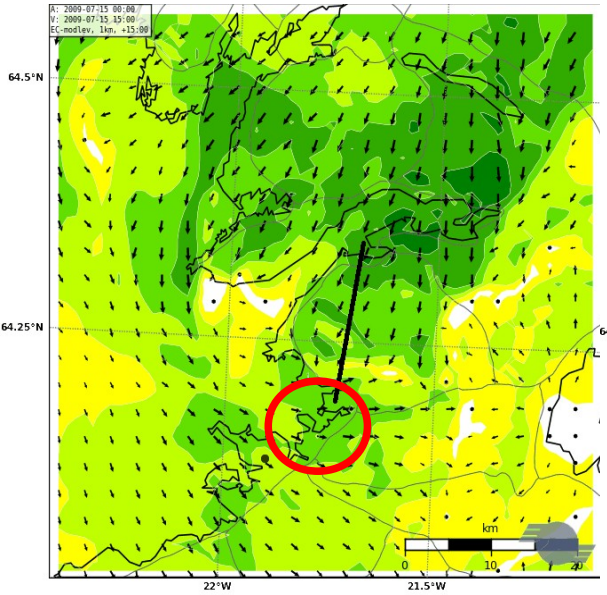
Connection ranged from very good (Heiðmörk) to very poor (Mýrarnar)

Test flights to investigate the 3G/GSM connection

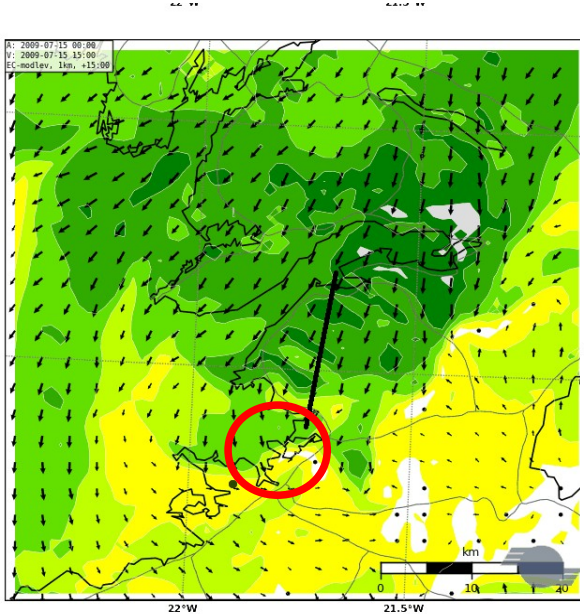
In all cases either the 3G or the GSM connection worked and data was transmitted successfully to the data base

Results from integrating SUMO data with WRF

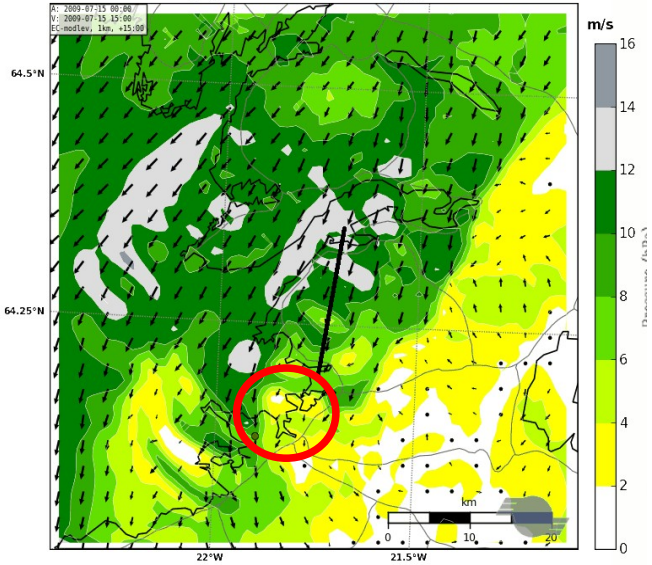
No SUMO



One flight



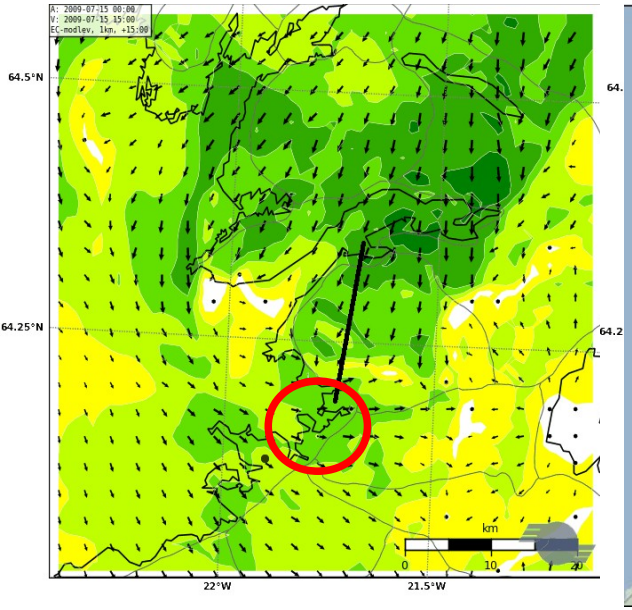
Five flights



Model resolution is 1km
Time is 15:00 UTC (T0 + 15 hrs)
Simulation based on global analysis shows the presence of a sea breeze in the afternoon
When combined with data from SUMO, this flow pattern brakes down

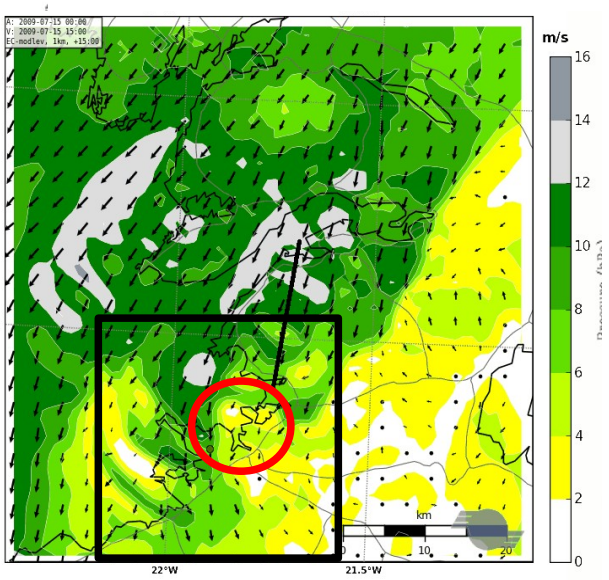
Results from integrating SUMO data with WRF

No SUMO



Location of observations

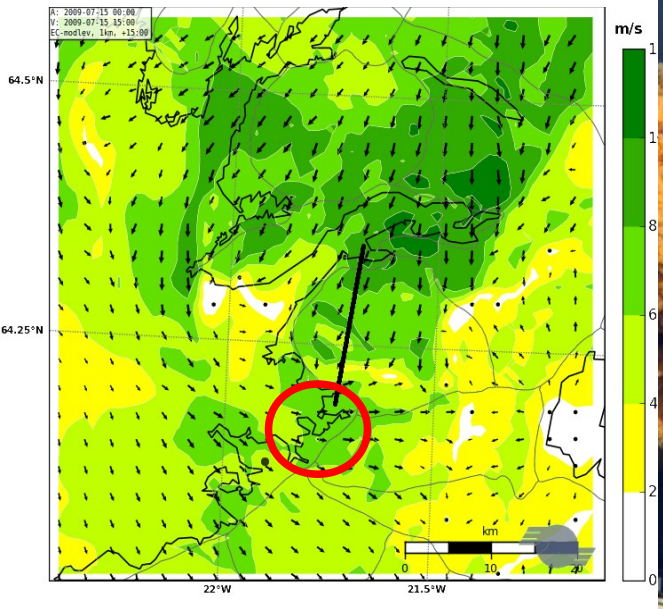
Five flights



At 15:00 UTC observations show NNW-N winds, ranging from 3 to 7 m/s
No sign of the originally simulated sea breeze

Results from integrating SUMO data with WRF

No SUMO



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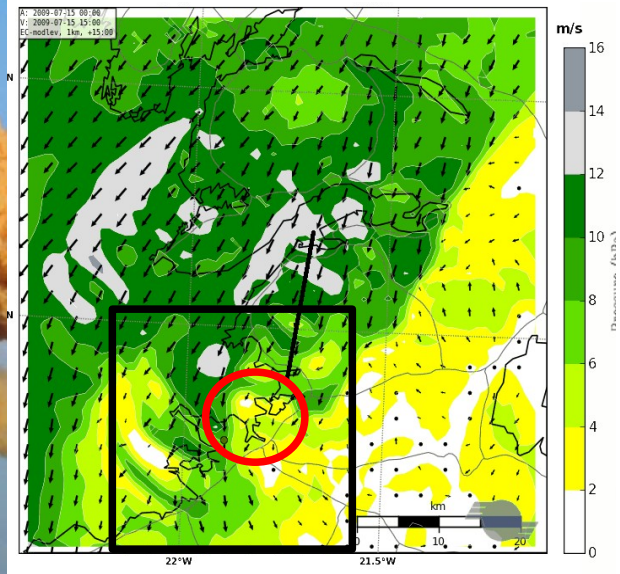
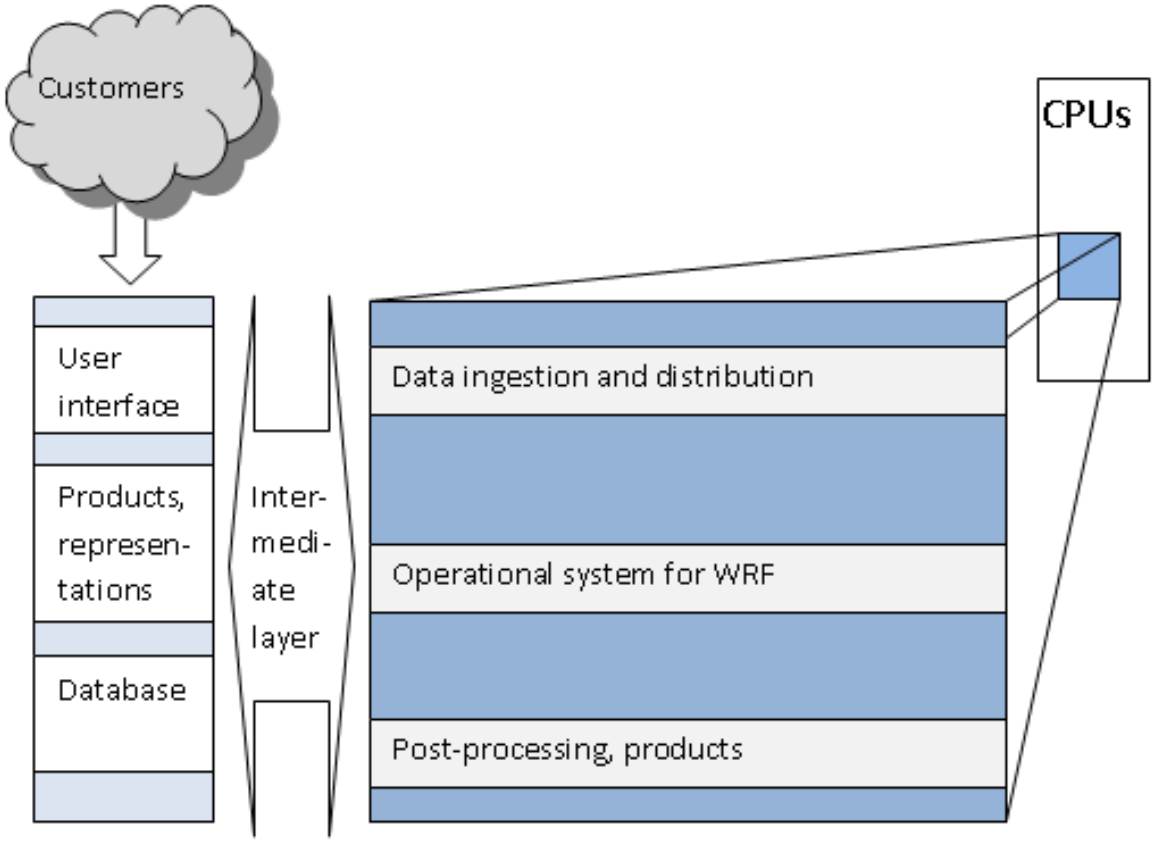


What if there was an explosition in a chemical plant?

Where does the wind driven pollution go?

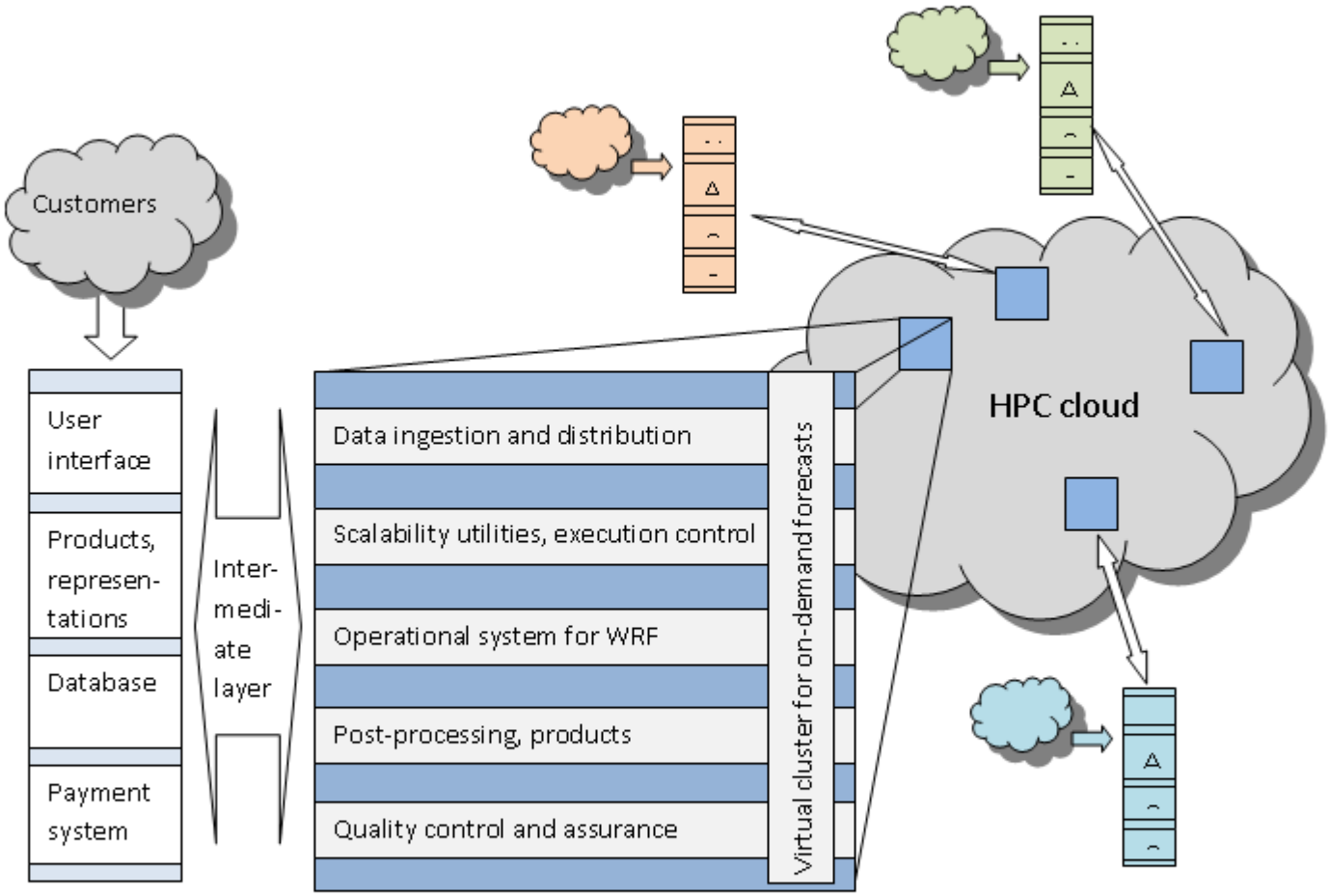
Good thing we now can add more sensors to the SUMO!

Towards the clouds...



Current model configuration

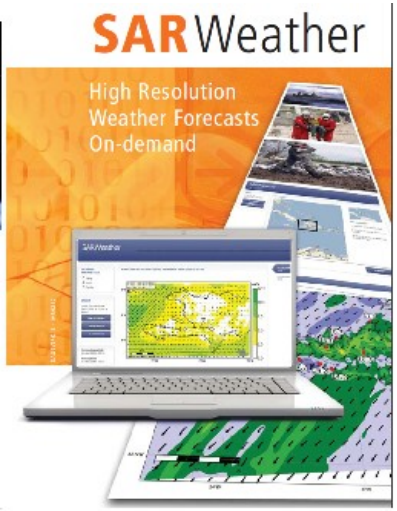
Towards the clouds...



Near future model configuration

System schematics

Integration with other systems
GalileoActive
GDACS
MapAction



User interface via
www.sarweather.com

GNSS

Data base

3G/GSM on flight data connection

Data source for
atmospheric model

Data assimilation
(optional)

Misc. datasources
(optional)

SARWeather

SARWeather

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Orders | Old orders

ORDER

NEW ORDER

LOGIN

Email: dev@sarweather.com

Password: ●●●●●●

Login

Remember me

Forgotten password

Print page

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Orders | Old orders

dev@sarweather.com
Sign out

Signed in.

ORDER

NEW ORDER

NO ORDER

No active order.

You can place a new order by clicking the button **New order** on the left.

OLD ORDERS

Pöntun 04 Oct 11:16
Pöntun 30 Sep 16:33
Pöntun 30 Sep 15:29
Pöntun 30 Sep 12:21
Pöntun 30 Sep 12:01
Pöntun 30 Sep 11:37
1 2 3 Next »

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Orders | Old orders

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Sign out

ORDER

NEW ORDER

NEW ORDER

Name

Order 08 Oct 11:49

GPS coordinates and radius | Rectangle area

Order by using GPS coordinates and radius

64.133333 , -21.933333

GPS coordinate

20

Radius in km

CONTINUE >

64.1333 , -21.93333

20

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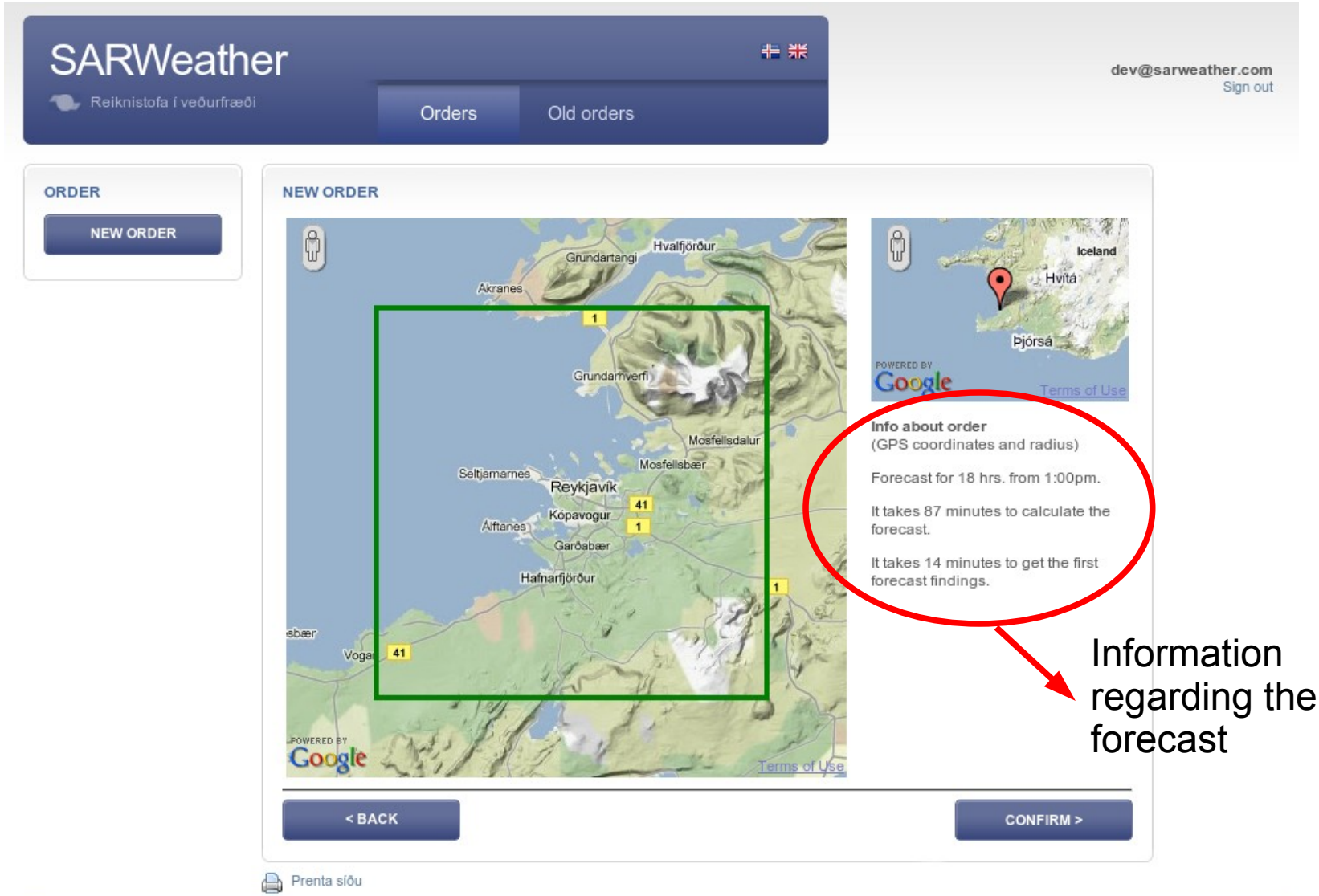
SARWeather



Information regarding the forecast

SARWeather

SARWeather

Reiknistofa í veðurfræði

Orders | Old orders

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Sign out

ORDER

Order for 08 October at 11:50 is active.

CANCEL ORDER

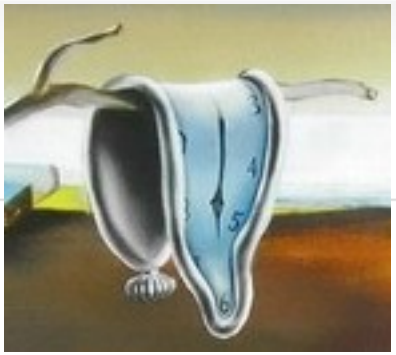
VIEW ORDER

NEW ORDER

The order has been received. The processing will begin shortly.

Please wait...

Print page



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SARWeather

SARWeather

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Orders | Old orders

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Sign out

PARAMETERS

- (•) Wind
- ( ) Combined
- ( ) Temperature

Forecast updated:
08 Oct at 06:00

Next update:
08 Oct at 12:00

ORDER

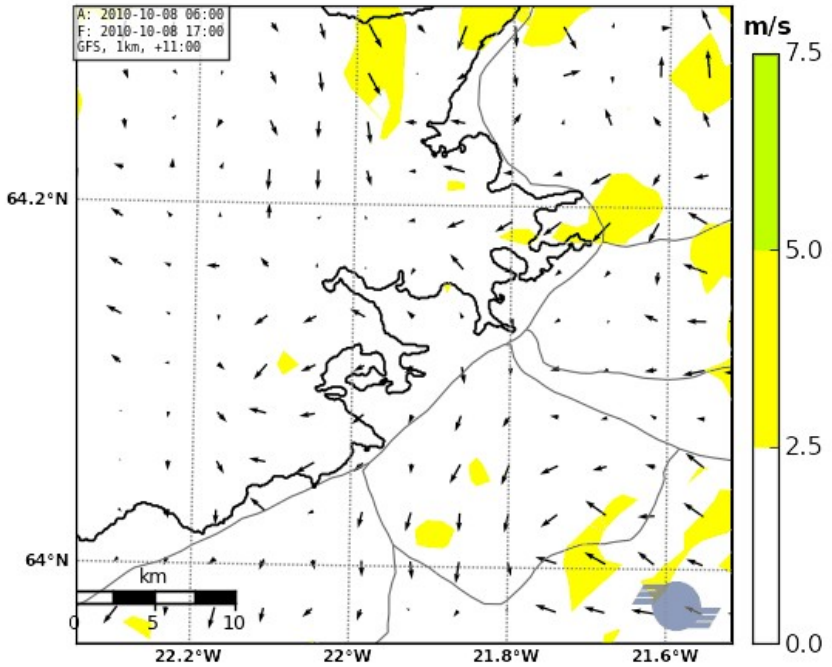
Order for 08 October at 11:50 is active.

CANCEL ORDER

VIEW ORDER

FORECAST VALID FOR FRIDAY 08 OCTOBER 2010 17:00:00 UTC

Oct 08
at 06:00



Friday

15 15 15 16 16 16 16 17 17 17 17 18

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Orders | Old orders

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Sign out

PARAMETERS

- ○ Wind
- ◉ Combined
- ○ Temperature

Forecast updated:
08 Oct at 06:00

Next update:
08 Oct at 12:00

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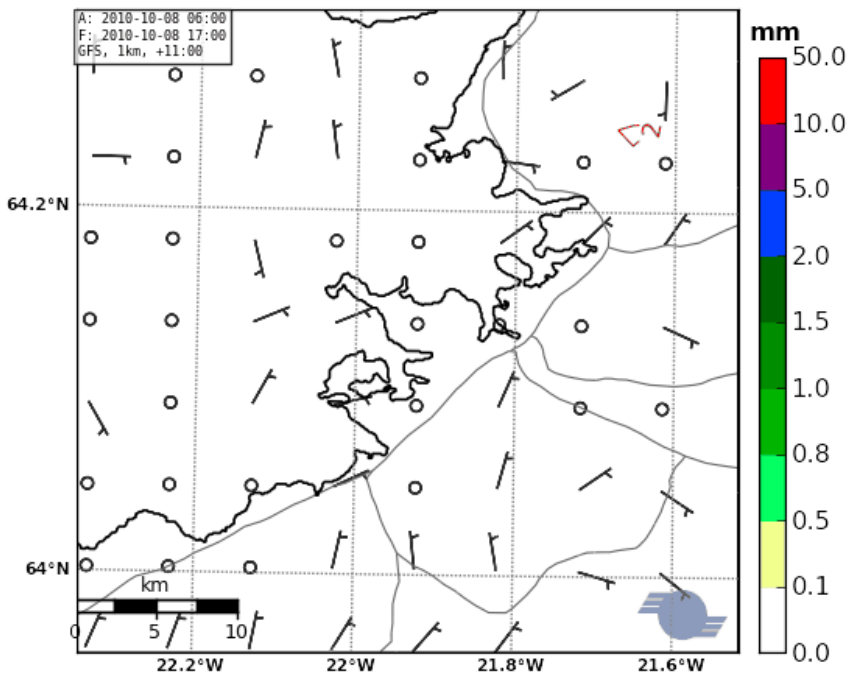

Friday

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Orders | Old orders

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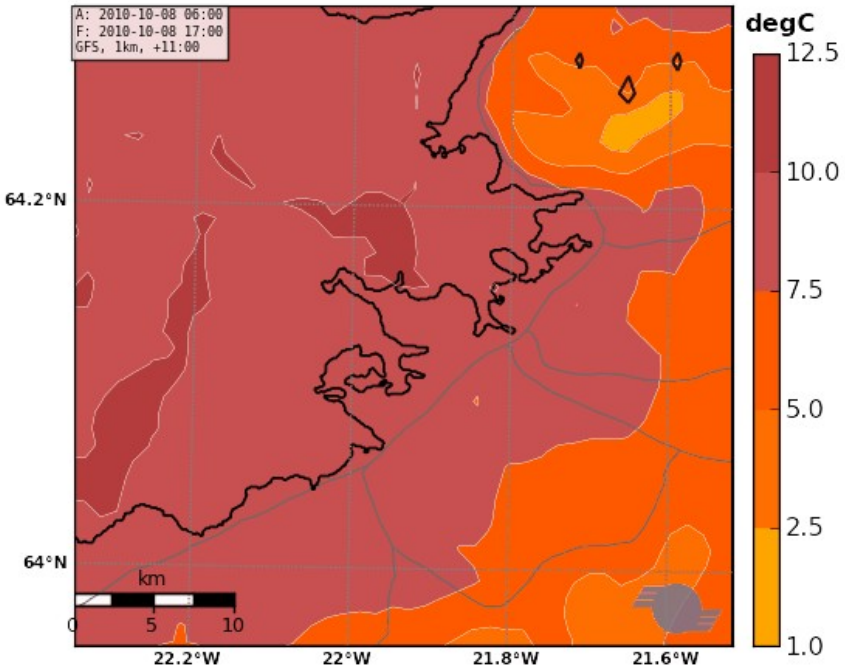

Friday

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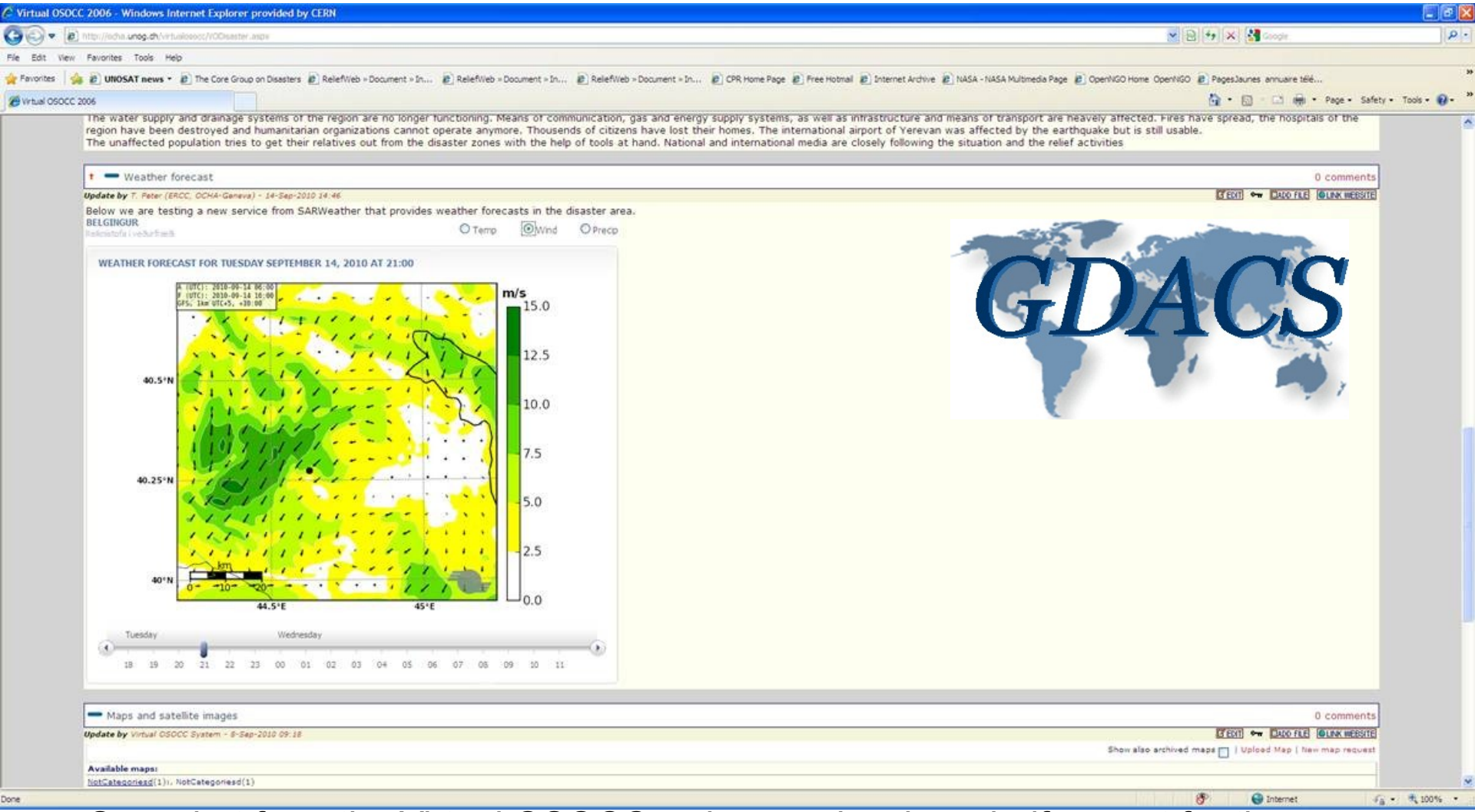
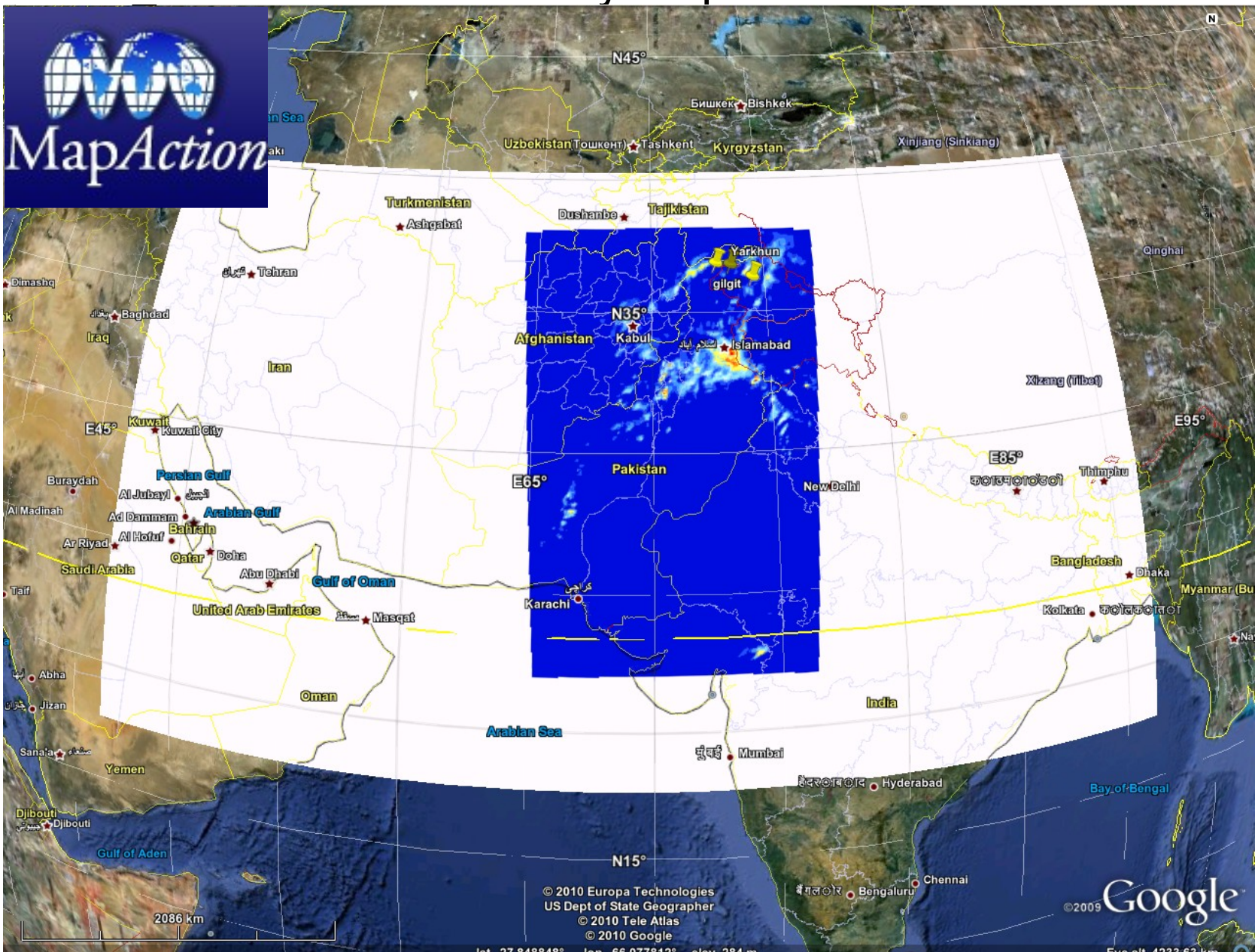
Integration with GDACS has already begun



Snapshot from the Virtual OSOCC webpage showing windforecast for the region of Kotayk. Part of the recent Armenia earth quake exercise (EADRCC Consequence Management Exercises ARMENIA 2010)

Has been used in Pakistan by MapAction



Things to do

- Finish the **SAR**Weather interface
  - Based on test user comments a number of minor refinements need to be done
- Build a new V2-SUMO plane
  - Done in collaboration with Reykjavík University and UiB
- Test flight, combining V2-SUMO with the **SAR**Weather forecasting system
- Integrate the **SAR**Weather system to a computer cloud to ensure scalability
- Install **SAR**Weather on Hexagon for academic research