

Institut Royal Météorologique



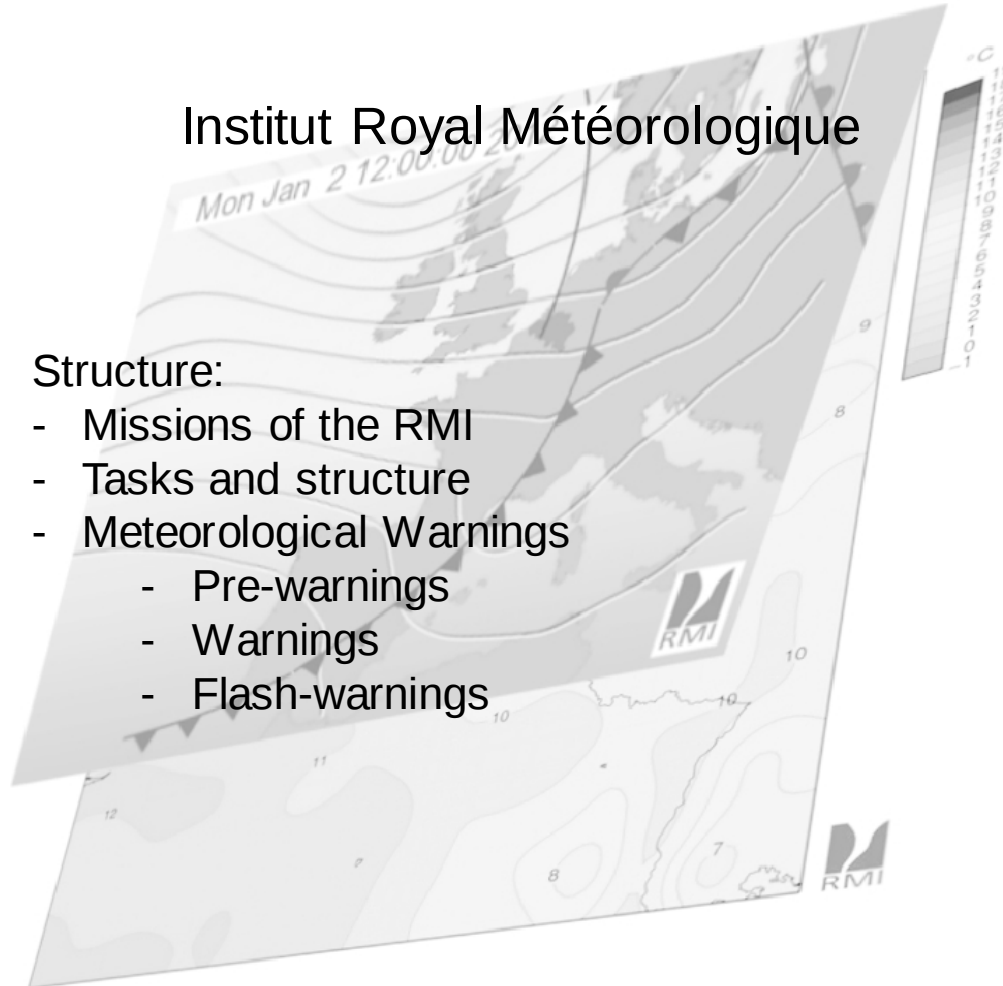


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Structure:

- Missions of the RMI
- Tasks and structure
- Meteorological Warnings
 - Pre-warnings
 - Warnings
 - Flash-warnings





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Mission de l'IRM (AR 1986):
La fourniture de services permanents:

En vue d'assurer la sécurité et l'information
de la population, des communautés
socio- économique et scientifique
Et l'appui aux autorités politiques.

Hydrométéorologie
Climatologie
Géophysique
Sciences connexes



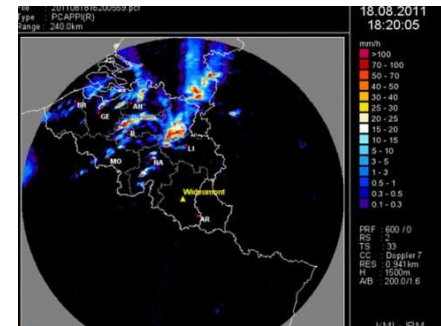


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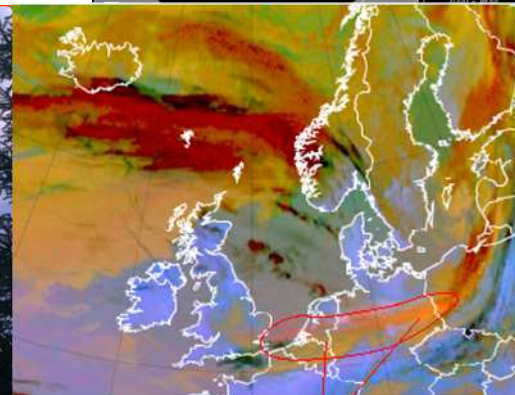


Observations:

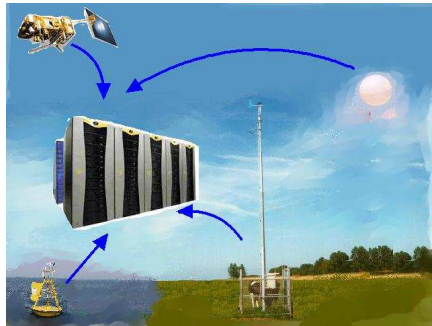
- Stations automatiques et climatologiques;
- Système de détection de la foudre;
- Radars météorologiques;
- Ozone et dispersion des polluants;
- Mesure du rayonnement;
- Satellites météorologiques;
- Laboratoire d'étalonnage;
- Princess Elizabeth.



Observations

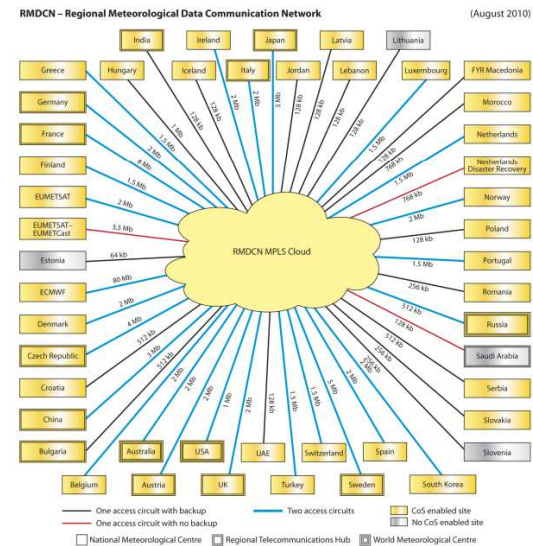


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Traitement de l'information:

- Echanges de données OMM et Belgique;
- Traitement des observations et des produits des modèles;
- Archivage et Base de données;
- Produits graphiques et visualisation;
- Computer Centre.



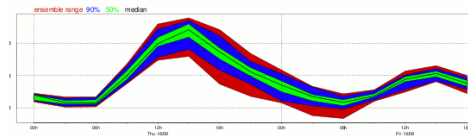
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GLAMEPS-o-GRAM

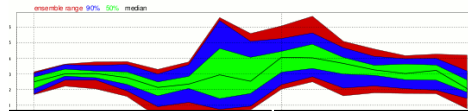
Hasselt

Forecast date: Thursday 18 August 2011, 00h UTC

2m Temperature



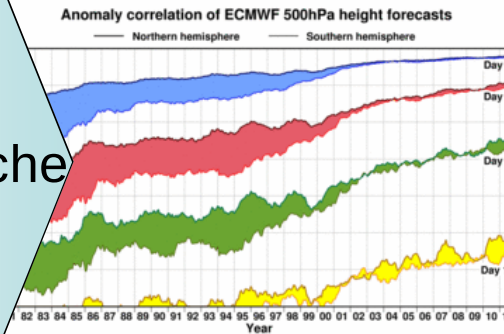
10m Wind



Recherche:

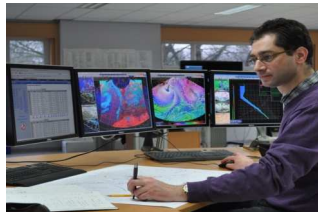
- Modèle de prévision Aladin;
- Recherche climatique (scénarios régionaux IPCC);
- Contribution internationale en modélisation;
- Nowcasting (INCA);
- Développement de nouveaux instruments de mesure;
- ...

Observations Traitement Recherche



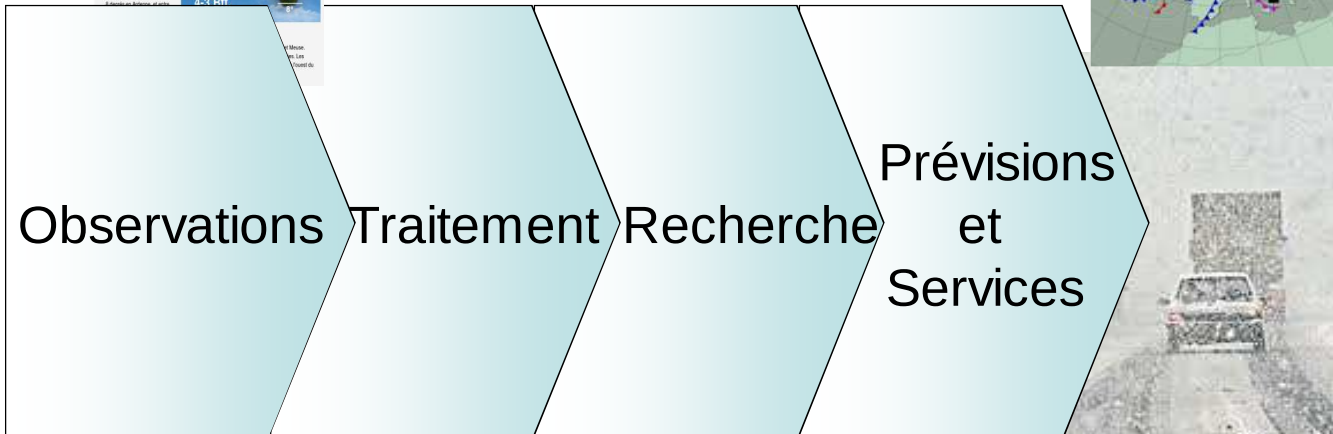
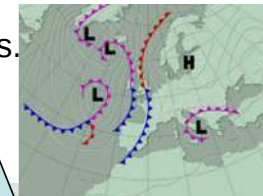
Courtesy of ECMWF. Adapted and extended from Simmons & Hollingsworth (2002)

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Prévisions et services:

- Prévisions grand public et spécialisées;
- Avertissements;
- Centre de Crise (tempêtes, volcanisme, Fukushima, ...);
- Services aux Régions et utilisateurs;
- Fonds des Calamités
- Statistiques et longues séries d'observations.

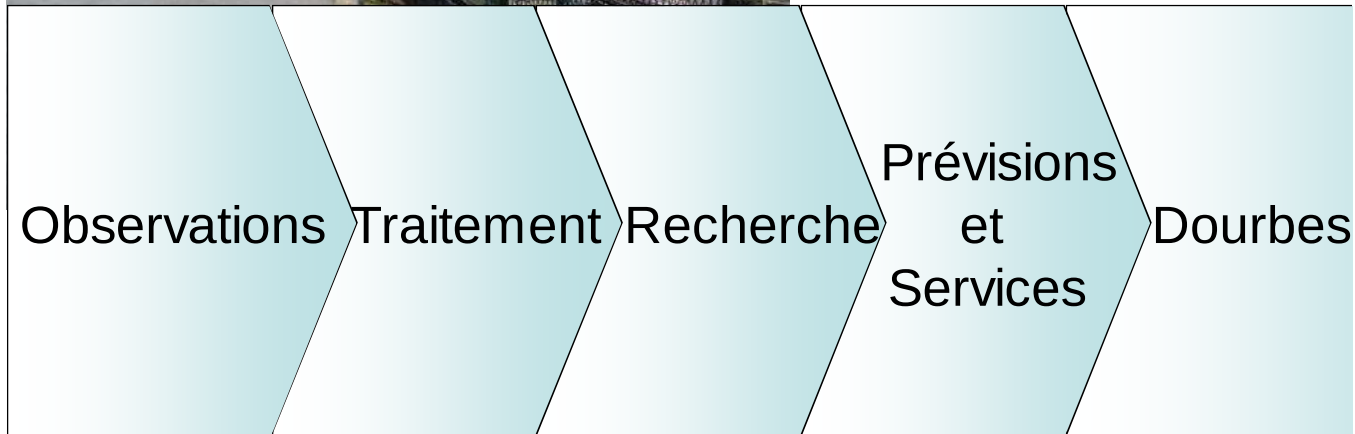


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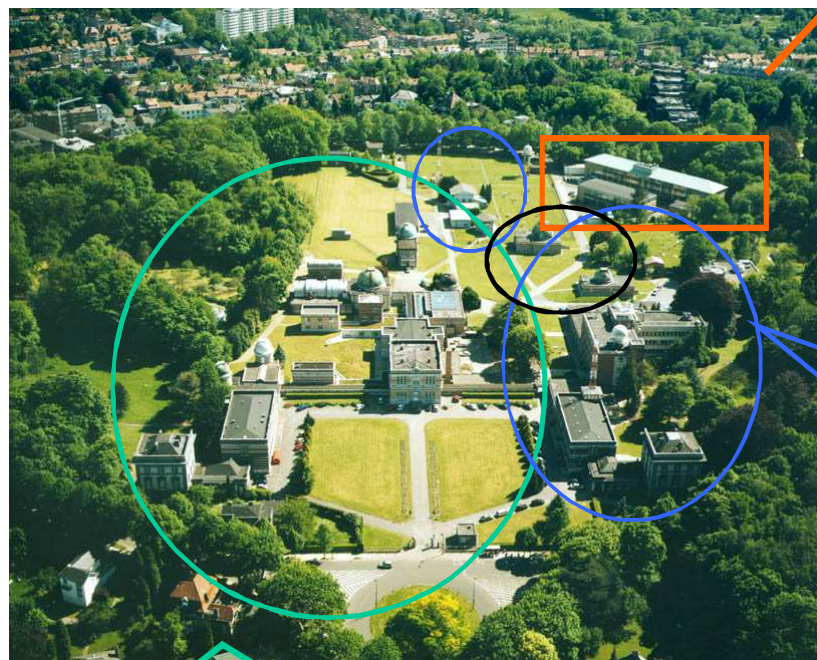


Centre de Physique du Globe:

- Géomagnétisme (Intermagnet);
- Paléomagnétisme;
- Ionosphère;
- Magnetic Valley.



THE SPACE POLE



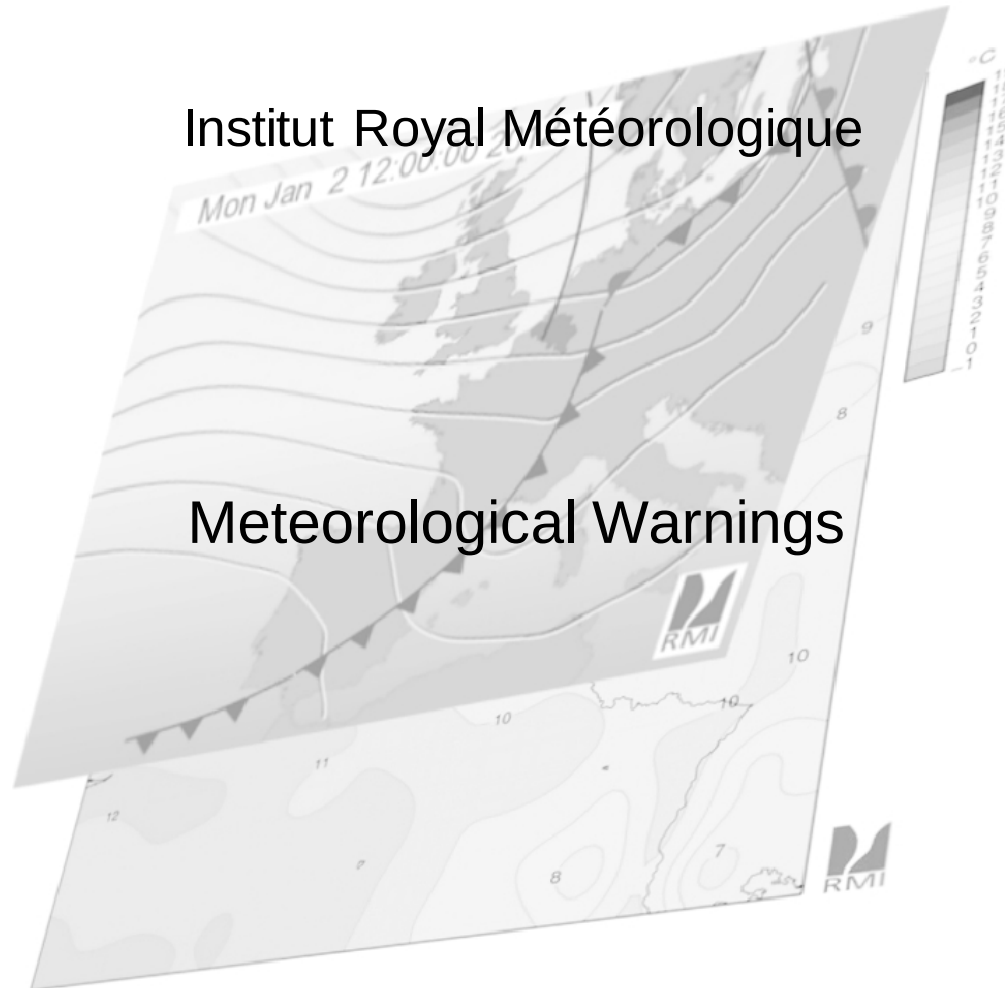
Belgian Institute of Space
Aeronomy (1964)

Royal
Meteorological
Institute (1913)

Royal Observatory of Belgium (1830)



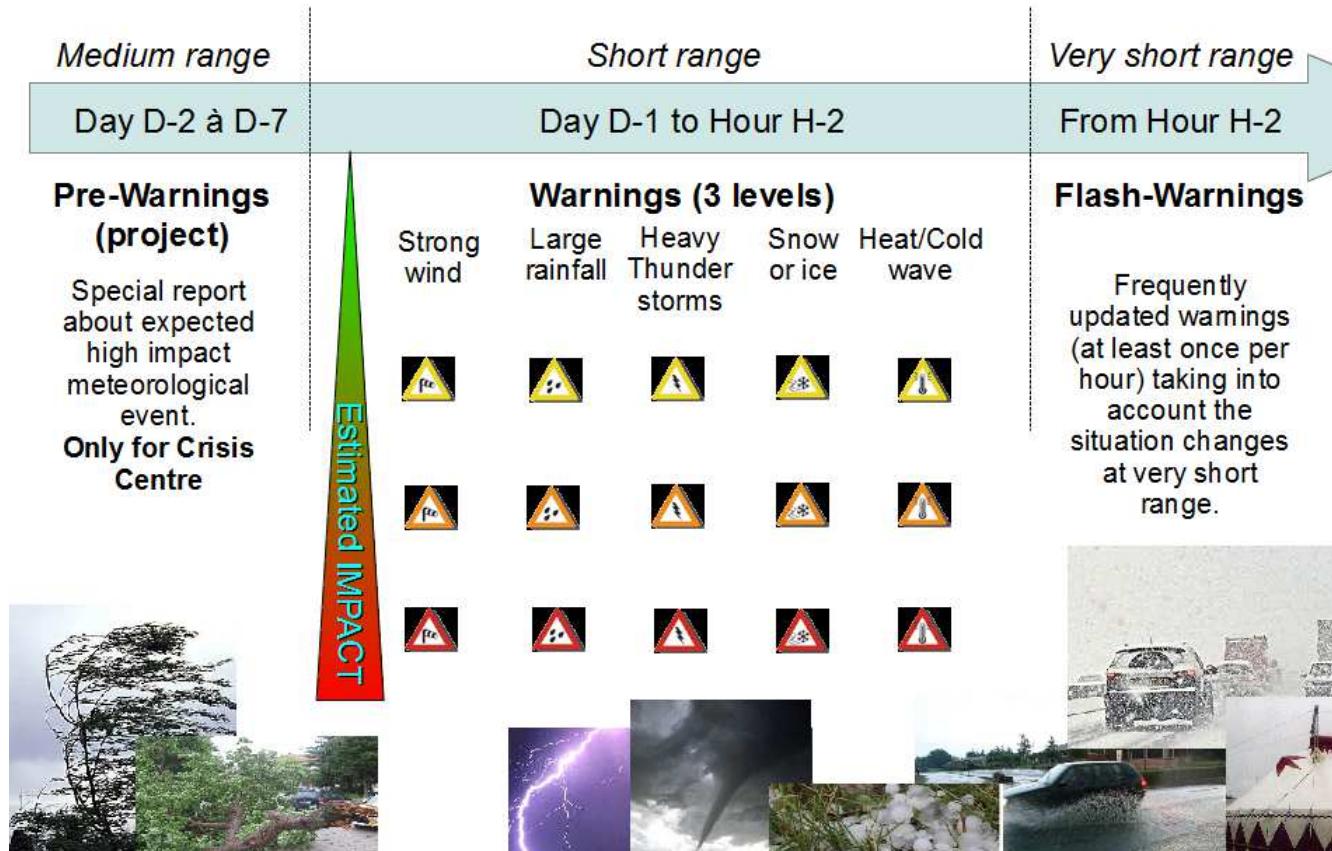
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Meteorological Warnings

OVERVIEW OF WARNINGS SYSTEM AT THE RMI WEATHER OFFICE

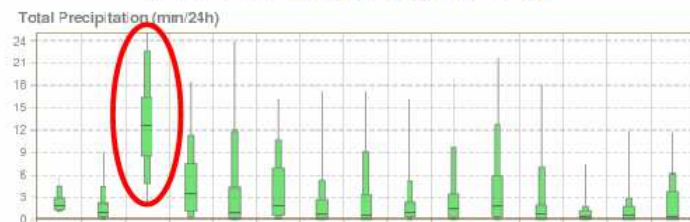
Issued warnings versus forecast range





**1. Pre-Warnings (Medium Range)
D-7 to D-2**

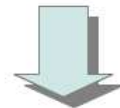
phenomena (large rainfall, strong wind, cold spell/heat wave,...) at medium range (up to J-7):



**Further investigations by the forecaster:
Checking of physical consistency, inter-(EPS) models comparison, ...**



Validation of possibility of high impact event



Pre-Warning to authority (Crisis Centre)





Pre-Warning to authority (Crisis Centre)

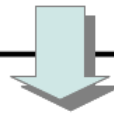
EXAMPLE:

Pre-Warning for risk of large rainfall
during the period from Friday 12 to Monday 15 november 2010

From 12 November a wavy and active perturbation associated to low pressure over the northern part of United Kingdom will cross our country and could lead to continuous and sometimes heavy rain. Total rainfall from 40 to 70 mm is expected.

Please pay attention to the next updates of this special report...

RMI – Weather Office



Pre-Warning is re-evaluated every days and can be:

- cancelled** if risk disappear or significantly decreases
- maintained** (with eventually adaptations)
- confirmed** as a **Warning** from D-1



2. Warnings (Short Range)

D-2 to H-2

WARNINGS



IMPACTS THRESHOLDS

WARNING



IMPACTS

No warning



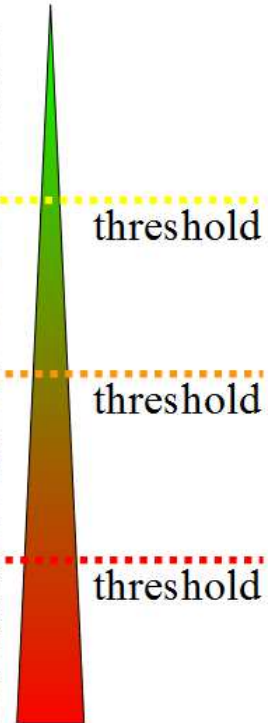
Warning



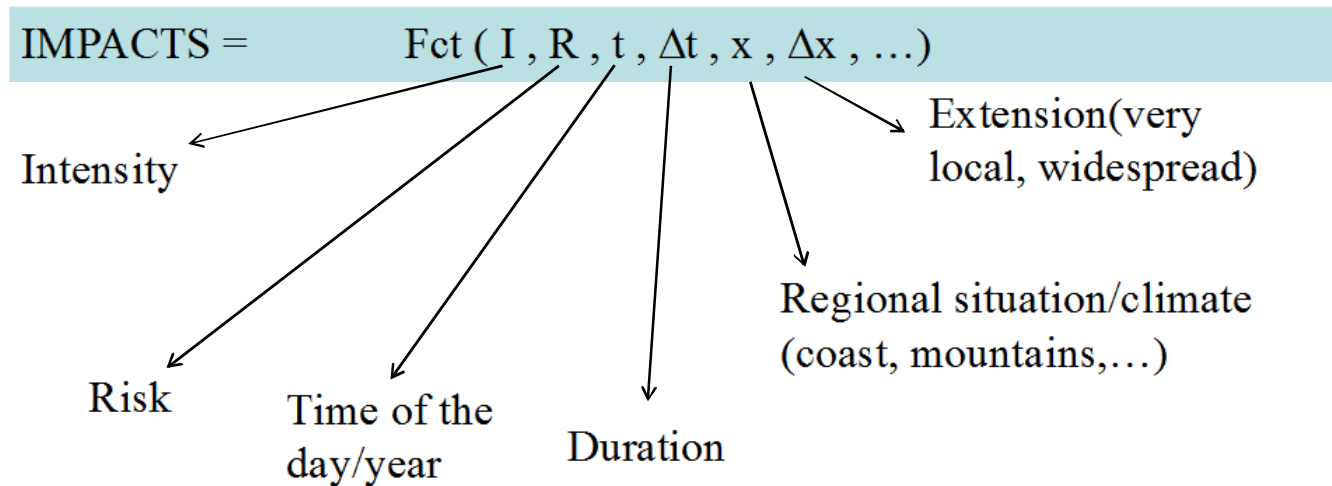
Warning



Warning



Assesment of the IMPACTS = complex function
of several parameters...



Warnings issued by the RMI weather office

General warnings (broadcast to large public):

- Strong wind (gusts)
- Heavy/large amount of rainfall
- Heavy Thunder (severe convection)
- Severe wintry situation (snow/freezing rain/black ice)
- Cold spell
- Heat wave

Special warnings (broadcast only to specific customers):

- Bad mixing conditions (pollution peak)
- SNCB: Water condensation in locomotive engine
- Gale warnings over sea for wind ≥ 8 Beaufort

Collaboration at international level

METEO ALARM





**3. Flash-Warnings (Very Short Range)
H-2 to the end of dangerous event**

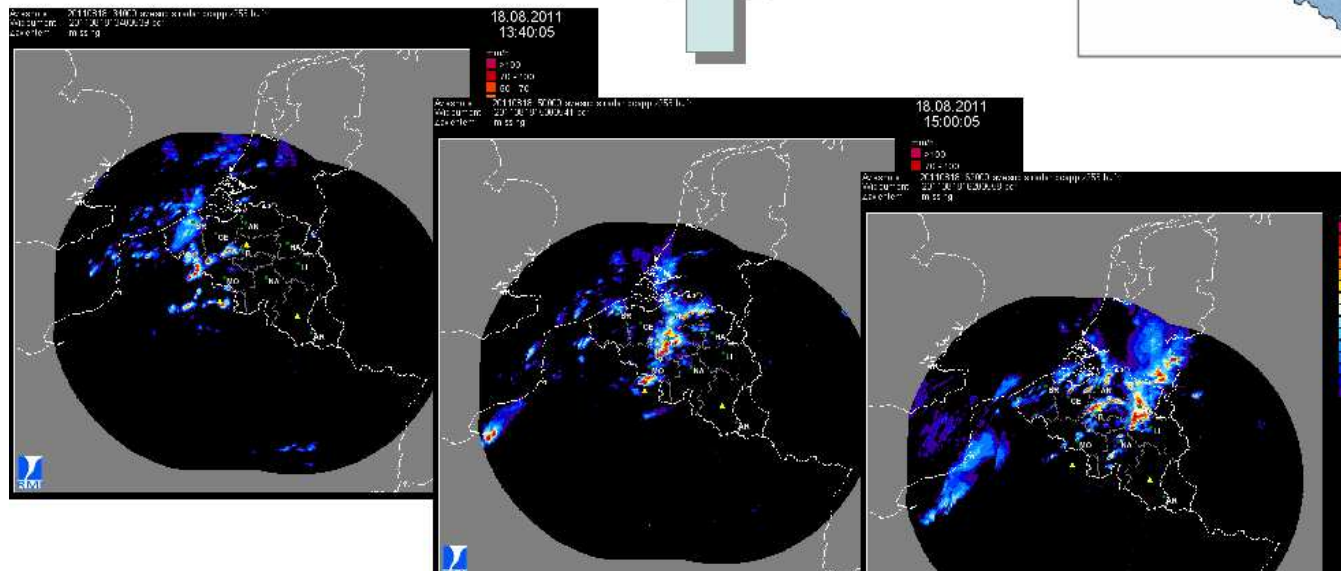
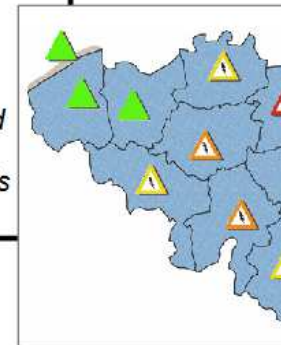
**orange or red alert: nowcast
warning on small scale on hourly
base, sent to media, emergency
center and to RMI website**

In case of **orange** or **red** warning level:
Nowcast-Warning sent to authority (Crisis Centre) at least every hour

EXAMPLE:

Nowcast-warning for heavy thunderstorms

Very active thunderstorms system has left the western part of the country and crosses the center. During the next 2 hours these thunderstorms will move towards the northeast and reach the provinces of Limburg and Liège. There is risk of heavy thunder with strong gust, hail and locally very large rainfall.





Nowcast based on INCA(ZAMG-RMI), mesoscale model output and observations

**Example: Pukkelpop disaster
18/08/2011, 5 victims**

Widomont: 2011081816150/36.pcr
Zaventem: missing

18.08.2011
16:15.00



mm/h
>100
70 - 100
50 - 70
40 - 50
30 - 40
25 - 30

INCA-BE

basic precip convect

BUKKELPOP III support

Refresh

Zoom Belgium on/off

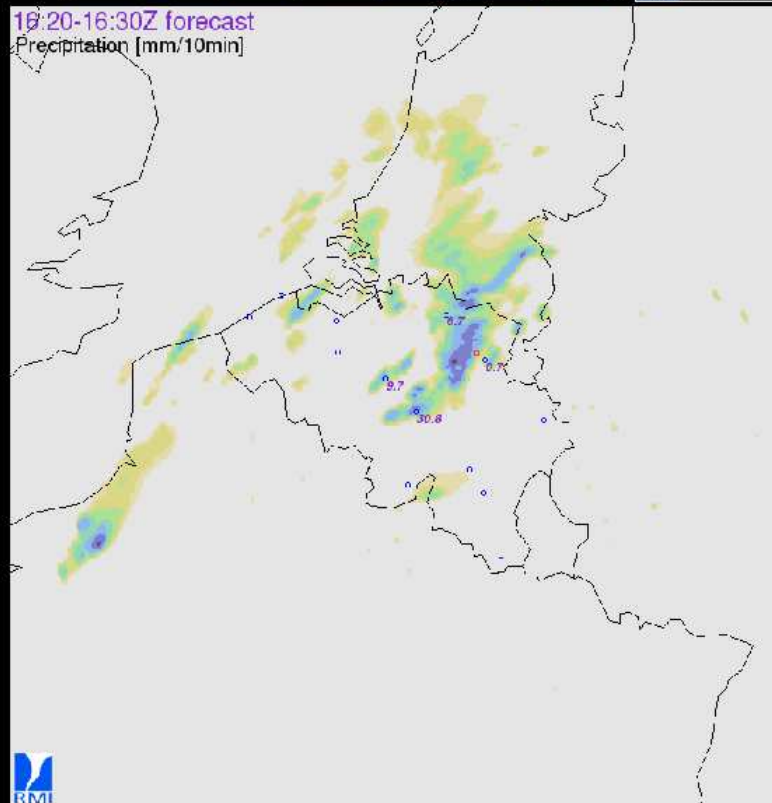
Play Stop - +

fixed std winter
TOPO RR PTP

12:20	14:40	17:00
12:30	14:50	17:10
12:40	15:00	17:20
12:50	15:10	17:30
13:00	15:20	17:40
13:10	15:30	17:50
13:20	15:40	18:00
13:30	15:50	18:10
13:40	16:00	18:20
13:50	16:10	18:30
14:00	16:20	18:40
14:10	16:30	18:50
14:20	16:40	19:00
14:30	16:50	19:10

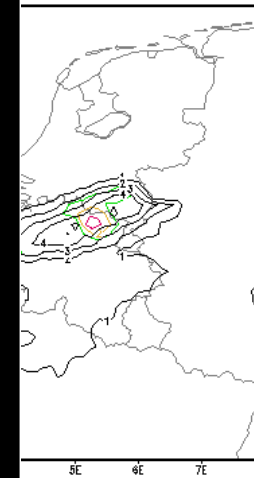
Show on map

18:20-16:30Z forecast
Precipitation [mm/10min]



16-C3-15:16:20 UTC

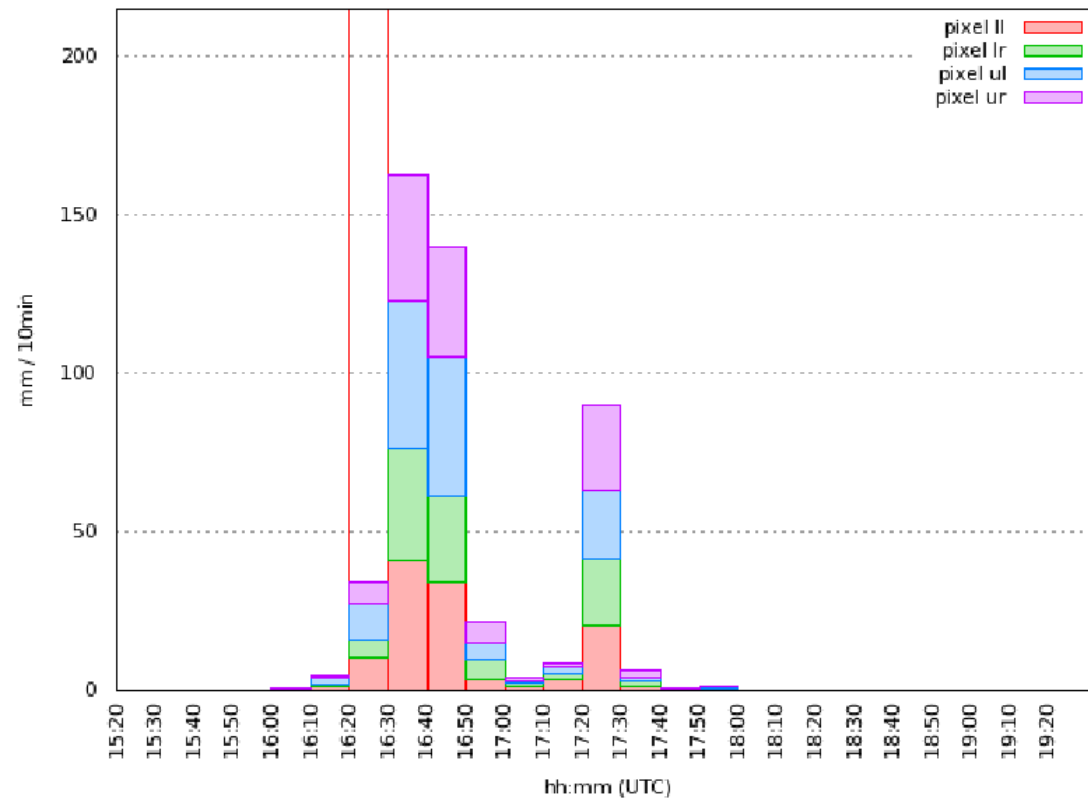
/supercell(black) risk +15h
011 15Z



5E 6E 7E 8E

2011-08-18-20:18

INCA-BE rainrate forecast Pukkelpop 15:20 UTC (60min before event)



RMIB climate observations track record

- Temperature, the Belgian climate time series, and precipitation since 1833.
- Sunshine duration since 1887.
- Ozone profiles since 1969, leading in Europe.

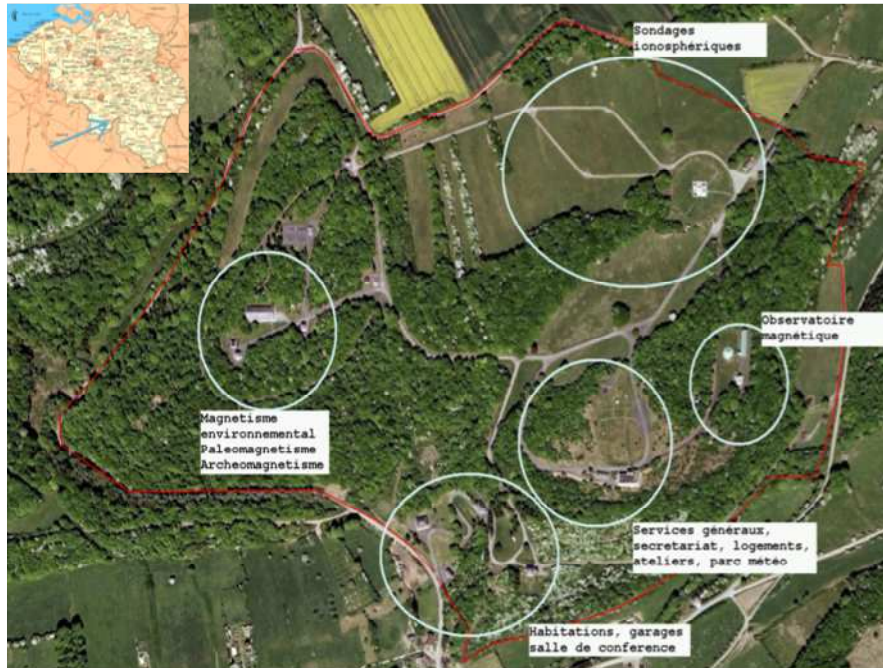
Global and direct solar irradiance since 1951, pioneer for solar energy studies in Europe.

- Total Solar Irradiance from space since 1983, leading in the World.
- Precipitation radar since 2000 (Wideumont), to be extended with Jabbeke, scientifically leading in Europe.
- Geostationary Earth Radiation Budget (GERB) since 2003, unique in the World.
- Aerosol observations from Princess Elisabeth station in Antarctica since 2009.
- Lidar since 2011, following Eyjafjallakökull volcanic eruption.

Latest development: Sun-earth Imbalance (SIMBA) nanosatellite, proposed for launch in 2013, will be first in the world.

Département 3 de l'IRM. Géophysique: Services et Recherche

Centre de Physique du Globe de DOORBES



Météo de l'Espace, Etude de l'ionosphère, Communications, Positionnement par GNSS

Champ Magnétique de la Terre, Programme INTERMAGNET, Navigation Aéronautique et Marine, Cartographie

Staff: ~30 personnes

« Magnetic Valley » pour valoriser localement le know-how du Centre par la production d'instruments et la fourniture de services commerciaux. Eveil des jeunes de la région aux sciences et techniques

Champ Magnétique Ancien, Propriétés Magnétiques des Roches, ...

Invitation cordiale à notre Ministre pour visiter le Centre de Physique



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