Royal Netherlands
Meteorological Institute
Ministry of Infrastructure and the Environment

Interactive 3D Visualization:

Handy Tool for Model Evaluation against Observational Data

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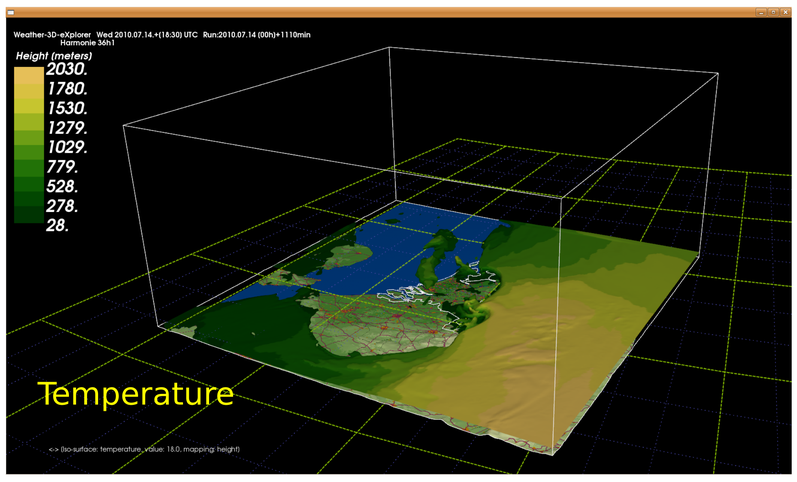
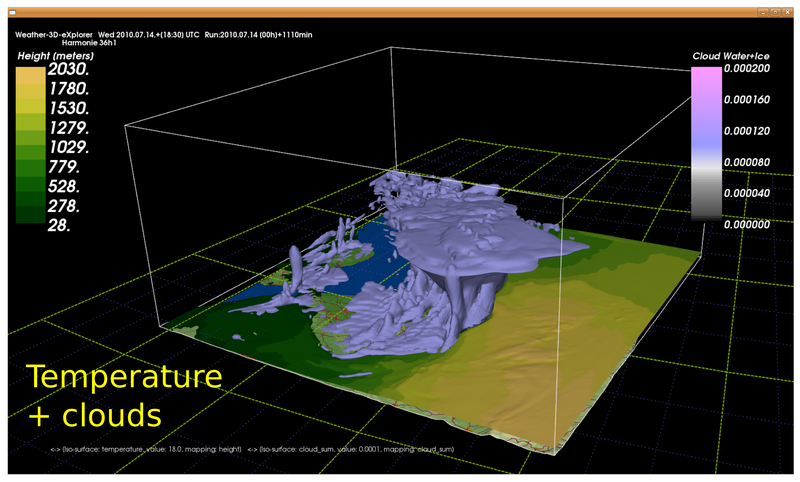
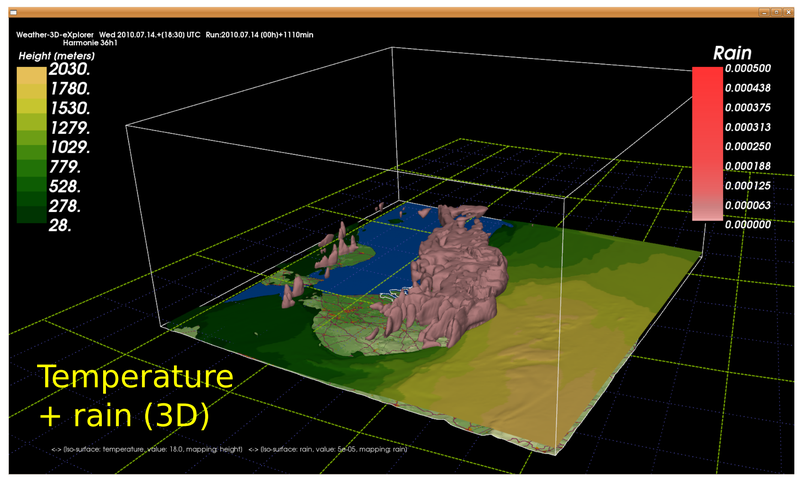
WEBSITE: http://www.knmi.nl/~koutek/w3dx/ * *KNMI Research & Development,*
'' *KNMI Product and Process Innovation*

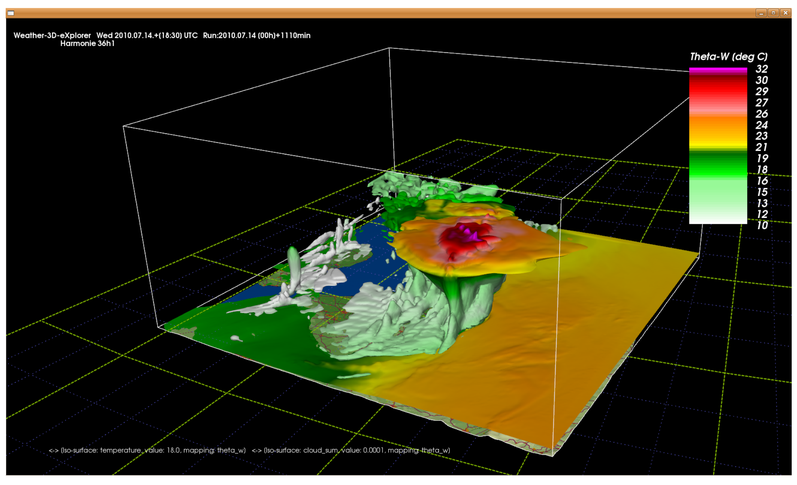
Example case: 14 July 2010; Weather Alarm Situation in the Netherlands



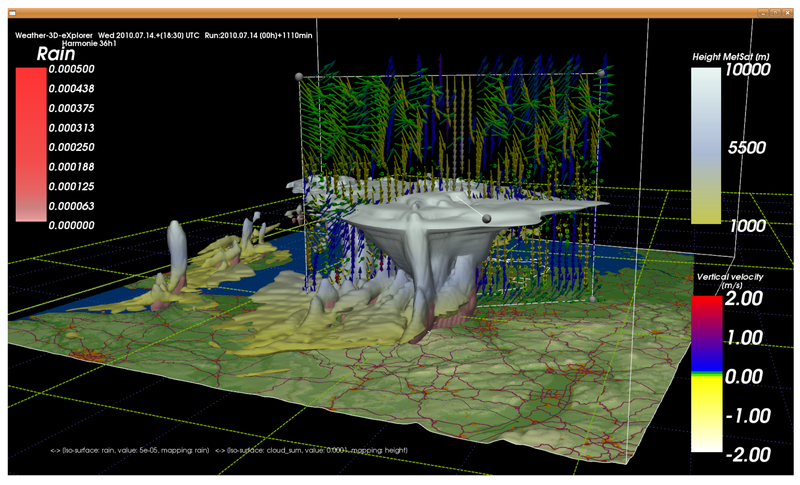




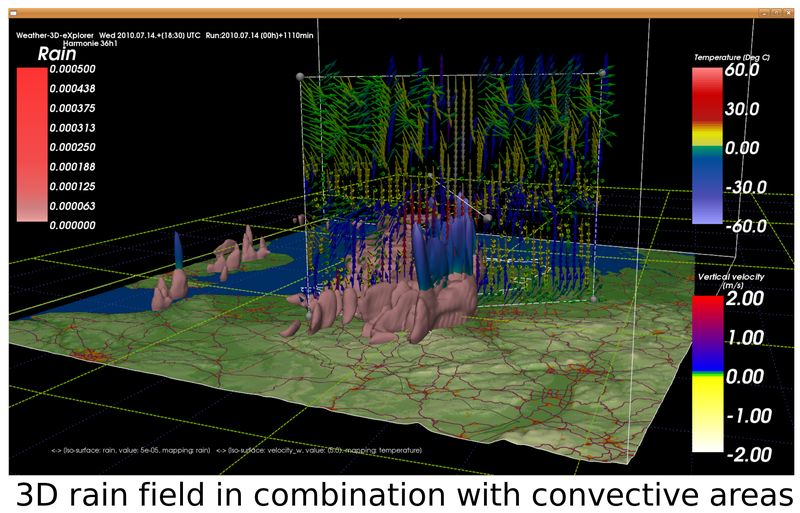
A clear temperature drop where the clouds and the rain move in.



Different sorts of air visualized with "Theta-w".



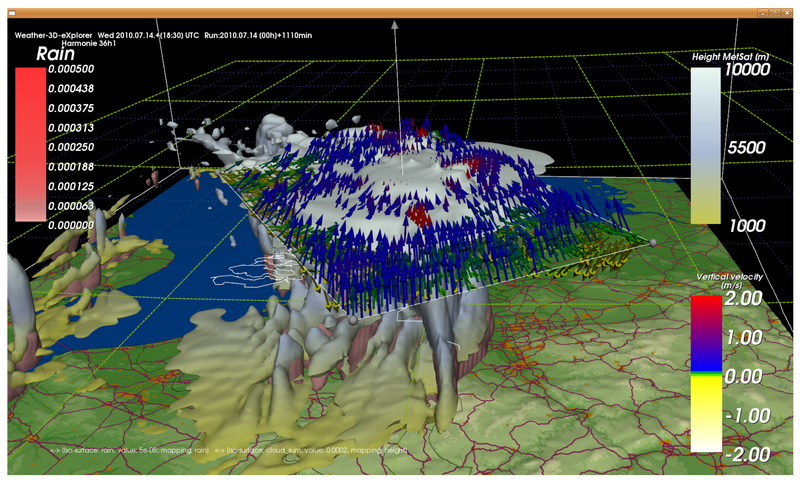
Clouds with 3D rain field in combination with the winds in a vertical cross-section.



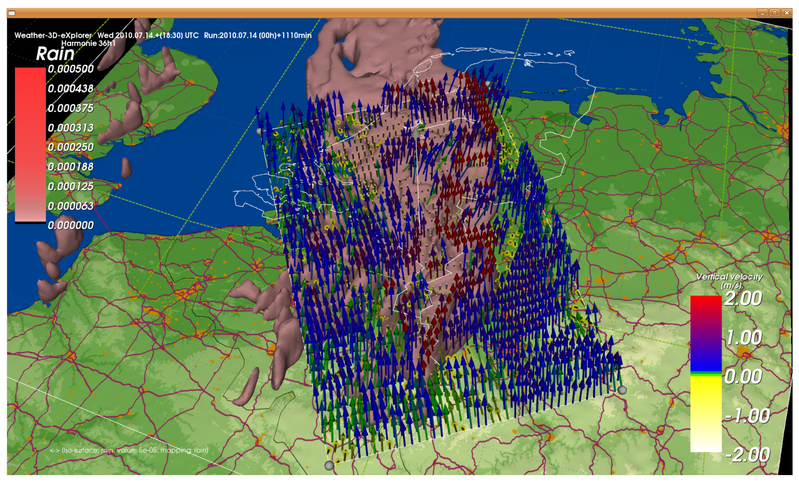
3D rain field in combination with convective areas (high vertical velocity iso-surface) with the winds in a vertical cross-section.

HARMONIE:

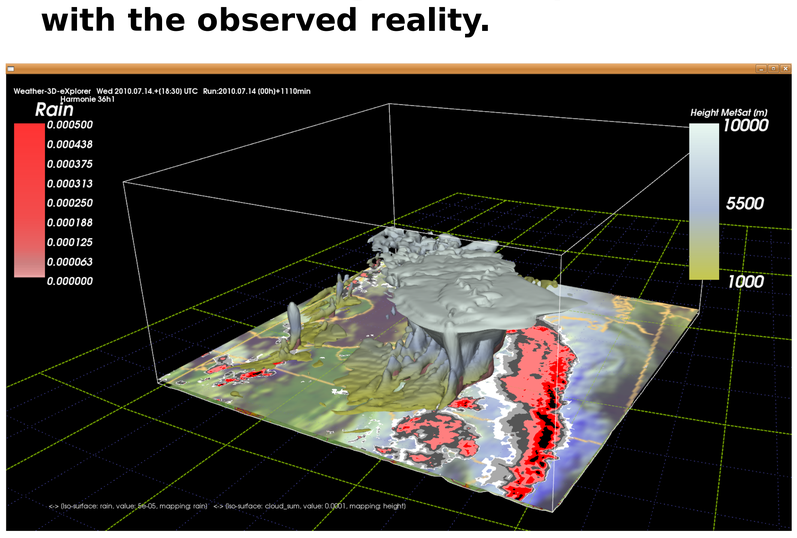
- **Model provides high detailed data, with a lot of fine 3D structures.**
- **Model is consistent with itself.**
- **Model is sensitive to data assimilation, and needs an appropriate nesting into larger area models, i.e. Hirlam or ECMWF.**
- **Visual comparisom with observational data helps to identify the situations where the model gets out of phase with the observed reality.**

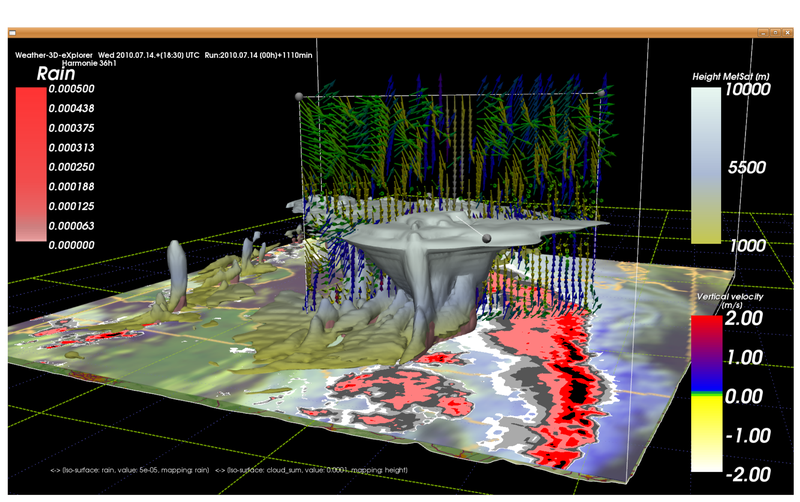


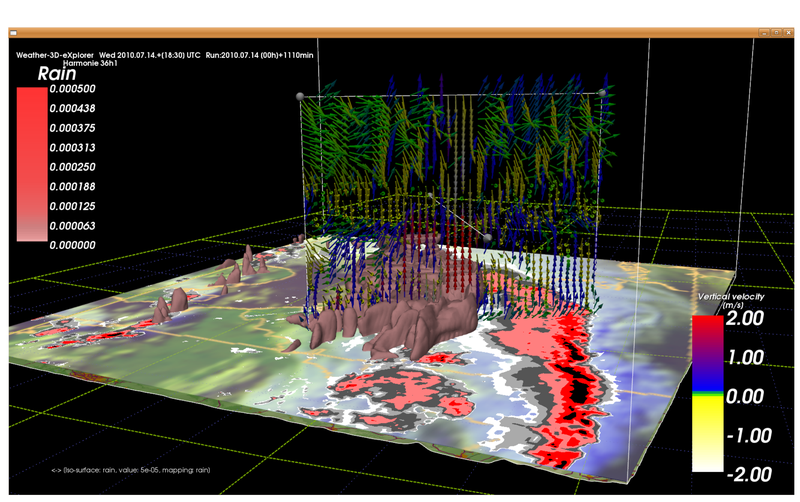
Winds around the cloud.



Winds around the area with intense rain.







Cloud, rain, and velocity fields in combination with satelite images and precipication radar data. Interactive 3D visualisation using the W3DX application provides means to study the response of NWP models (in this example Harmonie) under dangerous weather conditions. (Note: OFFSET)
It provide visual hints to the model developers so that they can improve the models and their application.
Also the meteorologists under operational conditions have an extra tool to base their decisions.

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