



QUICK GUIDE – RUN EMD-WRF ON-DEMAND MESOSCALE CALCULATION

Purpose:

To calculate high resolution mesoscale time series anywhere in the world.

In windPRO 2.9 we introduced the EmdConWx mesoscale dataset that has a spatial resolution of 3 km. The dataset only covers central Europe and hence there has been a demand for time series outside that domain with the same resolution and quality. Since windPRO 3.0 EMD offers its users the ability to run the WRF model (<http://www.wrf-model.org>) on our High Performance Cluster, to calculate time series anywhere in the world at the same resolution as EmdConWx. Besides being worldwide the on-demand solution also has a number of other advantages compared to EmdConWx:

- Newer version of the WRF model
- Better background roughness model
- Better solar radiation results
- Has turbulence information for all years simulated

Outline of Guide:

1. Price structure and meso credits
2. Running calculations
3. Data included in the results

1. PRICE STRUCTURE AND MESO CREDITS

There are *no* special modules that have to be purchased in order to run EmdWrf on-demand calculations. Instead the calculations are paid for when you perform the calculations and the price depends on how long a time series you request. We introduce the concept of a meso credit. A single meso credit will allow you to get 1 month of hourly time series data. So, for a 10-year time series the cost will be 12 (months) * 10 (years) = 120

meso credits. The meso credits are purchased by contacting sales@emd.dk or online at <http://www.emd.dk/windpro/online-ordering/>

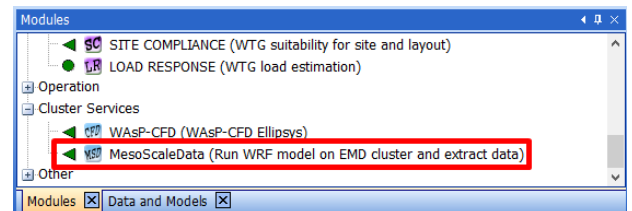
2. RUNNING CALCULATIONS

Running EmdWrf on-demand calculations is simple as you only need to define:

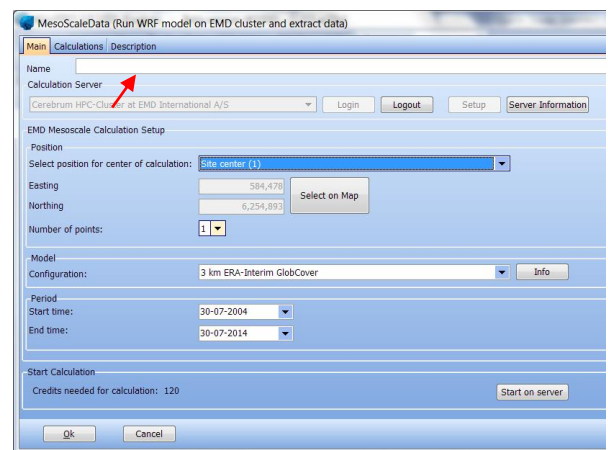
- ✓ Geo Location
- ✓ Period
- ✓ Boundary data

CALCULATION SETUP

To start a new calculation you create a MesoScaleData calculation in windPRO.



This will open the calculation setup window.



Start by pressing the Login button to connect to the computer cluster at EMD. The next step is to give the calculation a name and then select the position of the

Quick Guide – PARK with MESO data

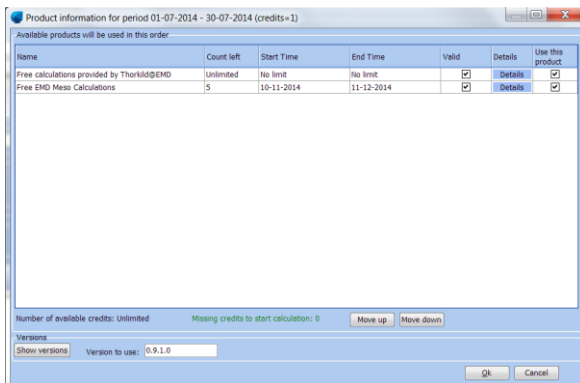
calculation. The position can be defined based on another object in windPRO, it can be manually entered (user defined) or you can select the position on the map by clicking on it.

The model configuration in the setup allows you to select which model to run. Currently, the only option you have is to select the boundary data for the calculation. This can be either ERA-Interim, MERRA-2, CFSR/CFSv2 or ERA5. You can read more about the performance of these options in this technical note: http://help.emd.dk/knowledgebase/content/TechNotes/TechNote_6_EMD-WRF_On-Demand.pdf

The last thing to define before starting the calculation is the period you want. If you have measurements on the site, you can start by running the period where you have data and then later on you can request the full period you need (10-20 years).

STARTING THE CALCULATION

Once you have set up everything it is time to start the calculation on the computer cluster at EMD. This is done by pressing the “Start on Server” button. This will give you the following window:



In this window you can see the meso credits that you have purchased and select in which order they should be used. In the window you can also see how many credits that will be used for the calculation (1 meso credit in this case). Once you are ready press the “Ok” button to go ahead and start the calculation. You will see one more confirmation dialog before the calculation is actually started. Simply click “Yes” if you are sure you want to start the calculation.

When the calculation has started you will see the “Calculations” tab that shows you the calculation you

just started and also show the estimated completion time for the job. During busy periods for the EMD cluster this can be quite a long time so simply click the “Ok” button and save the project.

DOWNLOADING THE RESULTS

Once the job has completed you will receive an e-mail confirming that the results can be downloaded in windPRO.

Open the project in windPRO and find the MesoScaleData calculation and open it. On the “Calculations” tab you should see the calculation you started and the button “Download results” should now be enabled. Click the button to download the results from the server. After the download completes the result is added as a Meteo object in the windPRO project.

3. DATA INCLUDED IN THE RESULTS

The main results are:

- Wind speed/direction and turbulence in 10, 25, 50, 75, 100, 150 and 200 meters.
- Temperature in 2 and 100 meters.
- Detailed solar radiation
- Surface pressure, humidity, precipitation, visibility, cloud cover etc.