EMD webinar:

Mesoscale data in windPRO 3.0
10/03-2015

Questions submitted during the webinar

Questions		Answers
How confident can we be applying this method to tropical regions?		Well, we have tested the EMD-WRF setup in several tropical regions including a major project in Indonesia and many places in Brazil and it have worked quite well. Modelling the tropical wind climate is more challenging so "raw" (unaveraged) correlations are often a little lower than in simpler climates as e.g. northern Europe, but wind roses and distributions are typically captured well ans so is day-to-day, seasonal and year-to-year variations.
Do I need a licens for EMD-ConWx Pre-runs for being able to order EMD-WRF data?		No – to run EMD-WRF you just need to have enough prepaid credits.
Do you have any information about the acceptance of EMD mesoscale data by wind experts like GL GH? Maybe an intercomparison of MERRA, EMD-WRF, EMD-CONWX, ERA-INTERIM, ...?		Many of the largest manufacturers, developers and consultants are already using EMD-ConWx. So I am sure that GL GH will accept use of EMD's mesoscale data, if the data are used in a proper way. Thanks for the suggestion – we will consider this for future validation publications.
What is the difference between using the MERRA data from EMD-WRF versus using directly the MERRA data like in WindPro 2.9?		There is a big difference! When used with EMD-WRF MERRA is just use as initialization and boundary conditions with the WRF model. MERRA itself has a resolution of ca. 50km in EMD-WRF using MERRA the resolution is 3km which captures much more of the important meteorological phenomena controlling wind speed and direction.
Is the downscaling of mesoscale data used as a substitute for met mast data initially?		Yes that is one way to do it. In very mature markets like Denmark or Germany with many existing turbines the downscaling is perfectly suited in combination with existing reference turbines to calibrate the model to further improve the accuracy of the method. In that case a local mast is not sed/needed.
Can you provide the papers mentioned in "Validations: external"?		I am not sure I am allowed to redistribute them for EWEA, however you can easily find them in the EWEA 2014 proceedings simply search for authors: "Konstantinos Gkarakis" "Dimitri Foussekis" "Eric Holtslag"
Can the emd-wrf be scaled to exact required coordinates, or is it just the available nodes?		Yes – because EMD-WRF is on-demand the grid is centred on your point of interest.

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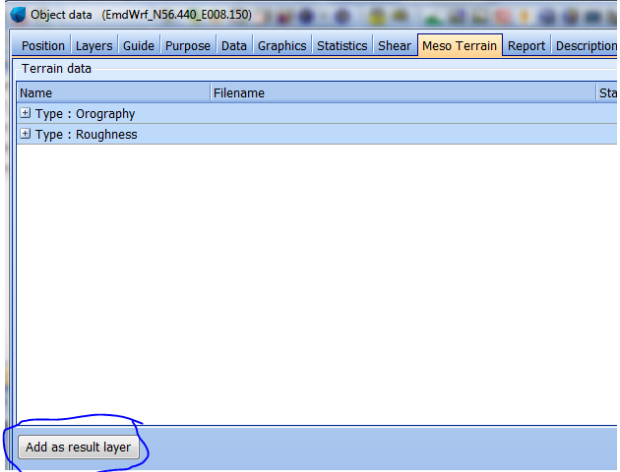
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Could we use any other mesoscale data than the ones provided by EMD in WindPRO and use Statgen for downscaling?	No not in the very easy "Downscaling via STATGEN" because for that you need the terrain and roughness from the mesoscale model. I am not aware that any other mesoscale providers supply this information. However, in the future we can support that the user can add this info manually if other providers should choose to make this info available with their mesoscale data.
Could you show us the mesoscale terrain downloaded? please	If you open a EMD-ConWx or EMD-WRF meteoobject and go to the "Meso terrain" tab simply click as highlighted below to have the mesoscale terrain and roughness model added as results layers in the windPRO project.
Does EMD done any model verification regarding the EMD-ConWx Mesoscale data /and EMD-WRF simulation result? any report we can refer to?	There are no official publications made by EMD, but perhaps we should make such a report.
What about the speed predictions for the future? Is it going to be available via WRF?	I am unsure what you mean? AS the webinar shows to update and existing EMD-WRF you simply reopen the calculation and select the time span you which to extent with and start that calculation. Once completed and you download it is automatically added in the existing EMD-WRF meteoobject. I guess that we can make this procedure even more easy in the future by automating definition of the previous end time and the time of the most recent data available.
How about changing Mesoscale model parametrizations?	Good question! The are many different options in WRF, the setup that we provide we have validated thoroughly and ourselves and also checked in general benchmark. We believe that for most users this is the best option. However, if you have special request for a

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		parameterization I am sure we can make a series for you – please contact our support (support@emd.dk) with you request.
There are a lot different windstatictics downloadable. Is it correct you can't download the EMD ConWx with the module MCP unless you have an extra subscription to EMD ConWx? Are all the others included in MCP?		Yes – and yes. The other on-line data sets comes with MCP for free download, but they are all of much coarser resolution like ERA (ca. 70km) or MERRA (ca. 50km) and hence typically not as accurate as EMD-ConWx or EMD-WRF which is run at ca. 3km.
Can we please get the presentation document?		Sorry – but the recorded webinar will be available on our helpdesk and youtube shortly.
Does the EMD ConWx generate weibulls and can you calculate shear from it?		Yes in the meteo object you see and make all the usual data analyses like Weibull and wind shear etc..
How do you cope with model boundaries in case of WRF. Do you run the model for a lot of domains?		I am unsure what you mean? However, regarding model domains we always make sure to have a significant buffer around the area of interest to prevent artifacts from the model boundaries.
Is the EMD-ConWx produce the same data set as the EMD-WRF?		No. EMD-ConWx is pre-run for a very large domain and EMD-WRF is on-demand and optimized for rather limited domain. There are some other minor differences in the model setup perhaps primarily the landcover model which more detailed and accurate in EMD-WRF. However, with downscaling which use this as input it will not make a big difference in most cases.
Raw correlation coefficients: what is the temporal resolution? 10 mins?		Yes – for each hourly sample in the mesoscale time series we pick the nearest 10min sample in the measurements and then estimate the correlation coefficient.
Is around 10% of mean abs error not too much?		Well – keep in mind that the mean error is very close to zero – so that on average for many masts the model works very well. A mean absolute error of 10% means that the model is not perfect on very single site, but the measurements with instrumentation and mounting alone will have an uncertainty of around 5%. With that said I can say that we want to improve the model even further, As mentioned in the webinar in most cases downscaling should not be used all alone – but with either existing reference turbines to calibrate the model or some reference wind data form the region to achieve the maximum accuracy.

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I would like to ask some questions:

1. All the online data from many different stations are measured at sites or these data are generated by correlations/calculations via special tools/programs ?

2. In case not directly measured at sites, has EMD carried on any checks the reliability of these data ? Can we use these data for calculations of a specific design of wind farms or these data are normally used for some preliminary phases of wind energy projects ?

3. The data of wind speed standard deviation and wind speed turbulence for each station are also included in online data set ?

1) I am not sure what you mean… But EMD's mesoscale data EMD-ConWx and EMD-WRF are generated using the WRF mesoscale model and using the global assimilation/reanalysis models ERA or MERRA as boundary conditions.

2) Yes - as we present in the webinar (please see the recording) there is an on-going and thorough validation going on internally at EMD but also external validations performed by third party.

3) The standard deviation is not pre-loaded for EMD-ConWx, but if you add the "SQRT_TKE" in the import filter this is the wind speed standard deviation.