



Milestone Summary Report: M1

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Work Package: WP2 – Parameters to flow models and global case studies
Milestone name: M1 – Sites and data requirements identified for global trial cases
Milestone status: Completed

Milestone description

M1 Sites and data requirements identified for global trial cases - at least 10 sites

The success of the project is highly dependent on validation of satellite based outcomes against measurements at wind energy sites around the world. Identification of suitable sites (at least 10) where both satellite data and ground truth observations are available is thus a stop/go criterion.

Activities and tasks completed

Requirements for test sites in InnoWind were discussed at a scientific meeting held at Vestas' premises in Aarhus on August 21, 2017. The meeting outcome was a list of detailed research objectives for InnoWind together with the types of in situ observations and satellite data/products needed for each analysis.

Several of the InnoWind partners hold large data bases with in situ observations of vegetation parameters, wind speed, or wind power production. The following criteria have been used to identify the most suitable sites for InnoWind testing (listed according to priority):

- Previous analyses have been conducted at the site so there is a basis for comparison of 'traditional' approaches with new InnoWind developments
- The sites represent different land cover and vegetation types (e.g. forest, agriculture, grass land, swamp, ..)
- The sites represent different orography 'classes' from flat to mountainous terrain
- The sites are distributed around the world so the coverage - and thus the potential - of satellite data and products can be tested

Deliverables and outcomes

A list of 12 test sites and their main characteristics (Table 1).

	Site location		In situ observations			
	Latitude	Longitude	Type	Start	End	Features
Østerild, Denmark	57° 4' 3.30" N	8° 52' 56.00" E	Multiple masts, lidar, point cloud obs.	28-01-2015	ongoing	Patchy forest, flat terrain, land cover change over time
Risø, Denmark	55° 41' 39.20" N	12° 5' 18.50" E	Mast	20-11-1995	ongoing	Mixed land cover (agriculture, forest, water), flat terrain, easy to reach
Falster, Denmark	54°45'47.07"N	12° 2'13.74"Ø	Mast	01-03-2008	30-09-2008	Forest with edge, agriculture, flat terrain
Hornamossen, Sweden	57°59'48.89"N	13°56'35.85"Ø	Mast	?	ongoing	Forest, hilly terrain
Ryningsnäs, Sweden	57°16'33.93"N	15°59'12.35"Ø	Mast, point cloud obs.	2010	2011	Forest, hilly terrain
Norrbäck, Sweden	64.715°N	17.684 E	Mast	?	?	Forest, hilly terrain
Kassel, Germany	51.361680N	9.188759E	Multiple masts and WindScanners	01-10-2016	01-01-2017	Forest, hilly terrain
Perdigao, Portugal	39.708665 N	7.738735 W	Multiple masts and WindScanners	15-12-2016	ongoing	Forest, complex terrain with double hill
Humansdorp, South Africa	-34.109965	24.51436	Mast	01-10-2010	ongoing	Patchy forest, agriculture, not complex, well documented site with photos.
Camargo, Mexico	26.315558	-98.850064	Mast	01-01-2012	31-12-2012	3 masts (about 60-100 km distance between them). Mix of natural (semi-arid), agricultural and urban, flat terrain, well documented with photos.
Los Naranjos, Mexico	23.890944	-98.027519	Mast	01-04-2005	30-11-2009	3 masts (about 60-100 km distance between them), mix of natural (semi-arid), agricultural and urban. Flat terrain.
Francisco Villa, Mexico	25.020772	-98.0875	Mast	01-04-2005	30-11-2009	Well documented with photos, one site at 50 and 80 m, but others are lower (20 and 40 m). Measurement period does not coincide.

Table 1. Test sites selected for InnoWind