

D1.1- Oceanographic and meteorological conditions for the design

Met-ocean conditions and seabed characteristics greatly influence design of marine structures. Their adequate definition is thus crucial for the upscaling of the innovative floating substructure concepts of LIFES50+ to support a 10 MW wind turbine, as well as for the evaluation of their performance in a realistic range of operating conditions.

The deliverable D1.1, “*Oceanographic and meteorological conditions for the design*”, provides three sets of environmental parameters for moderate, medium and severe met-ocean conditions. To ensure sufficient realism and coherence between the different parameters, site-specific data is taken from three real locations considered as areas of interest in terms of offshore wind energy resource. By consensus decision of consortium partners, the areas selected are as follows:

- Site A (moderate met-ocean conditions), offshore of Golfe de Fos, France
- Site B (medium met-ocean conditions), the Gulf of Maine, United States of America
- Site C (severe met-ocean conditions), West of the Isle of Barra, Scotland

It is worth to mention that the aim of this document is not to perform a complete site assessment for a real wind-farm project but rather providing realistic and coherent environmental parameters for upscaling and evaluating the platform concepts involved in LIFES 50+ project for moderate, medium and severe met-ocean conditions. Moreover, these three areas (sites A, B and C) were selected to cover a large range of depths (70 - 130 meters) in order to enhance the project’s outcomes.

Within this document, a characterization of the three selected sites is performed, detailing the environmental parameters required for a conceptual/basic design of a floating offshore wind substructure.

The table below summarizes the characteristic met-ocean conditions for the three sites.

	50-year wind at hub height [m/s]	50-year significant wave height [m]	50-year sea-state peak period [s]	50-year current [m/s]	Extreme water level range [m]	Design Depth [m]	Soil Type
Site A	37	7.5	8-11	0.9	1.13	70	Sand/Clay
Site B	44	10.9	9-16	1.13	4.3	130	Sand/Clay
Site C	50	15.6	12-18	1.82	4.2	100	Basalt

In-situ data sources were sparse for Site A, relative to sites B and C. Hence the evaluation of environmental parameters there relies primarily on published results, while for sites B and C buoy data has been used more extensively.

