The Mid Atlantic Current Hindcast (MACH) is a 20-year hindcast of high quality current data for the mid-Atlantic region that meets oil and gas operator requirements for engineering design and reduction of operational risk.

### Application

MACH provides support throughout a project lifecycle with essential input of current data for:

- seismic exploration planning, by optimizing the survey line pattern.
- assessment of worst case design loading conditions for subsea components such as risers.
- assessment of dynamic loading.
- operational planning, such as FPSO shuttle tanker offloading.
- oil spill contingency planning.

### What is MACH?

The Mid Atlantic Current Hindcast (MACH) is a joint initiative between the Met Office, Oceanweather Inc. and BMT ARGOSS.

The group collectively brings together the necessary skills, knowledge, experience and access to computational resources to build a 20-year hindcast of high quality ocean current data for the mid-Atlantic region.

MACH utilises state-of-the-art assimilative layered ocean modelling techniques forced by high integrity wind fields and is validated against extensive in-situ oceanographic measurements, resulting in a major update to existing hindcast studies throughout the region.

High resolution nested grids covering principal oil and gas concession areas, provide high quality long-term detailed characterization of ambient and extreme ocean current conditions through the full water column, with significant economic, safety and environmental benefits for the engineering design and operation of offshore field developments.

A scheme of model nesting is used such that a very fine 1/36° grid covers the key oil and gas deep-water provinces in west Africa; an outer 1/12° grid covers the full central and South Atlantic, and this is nested into a global grid at 1/4° resolution.

- State of the art assimilative layered ocean modelling techniques forced by high integrity wind fields
- Validated against extensive in-situ oceanographic measurements
- Providing a major update to existing hindcast studies throughout the region.
- Offering significant economic, safety and environmental benefits for the engineering design and operation of offshore field developments.

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Area of coverage of MACH data set. Data region outlined in red.
Advantages
The use of advanced ocean modelling techniques in the generation of the MACH hindcast data, calibrated with historical in-situ measured data, provides a validated long-term spatial ocean profile hindcast at reduced costs and short lead-in time.

- Off-the-shelf data for engineering design at short lead times
- Improved accuracy of hindcast data calibrated with in-situ measurements
- Long-term data set for inter-annual variability studies
- Spatial overview of current circulation over a region
- Source of reliable current data without risk and costly measurement programme

MACH Standard Products/Deliverables
The MACH data set comprises of a twenty year three-dimensional hindcast of currents in the West Africa region for the period January 1993 to December 2012.

Data deliverables are provided at a grid spacing of 1/36° for exploration and production areas between 10°N and 30°S across the West Africa region.

Hindcast time series are delivered as ASCII files or, alternatively, may be delivered as NetCDF or point-sorted OSMOSIS formatted files (for which a separate OSMOSIS License is required).

Data deliverables are available as:
- Time series of current velocity, including residual and tidal components available at 75 levels throughout the water column at each archived grid points at hourly intervals.
- Time series of temperature and salinity at daily time intervals.
- Regional data set of current data over a pre-defined grid (Figure 1).

MACH Licence Subscriptions
Data from MACH may be purchased for a specified location (grid point at 1/36° resolution) or region. Alternatively the whole West Africa region data set may be purchased.