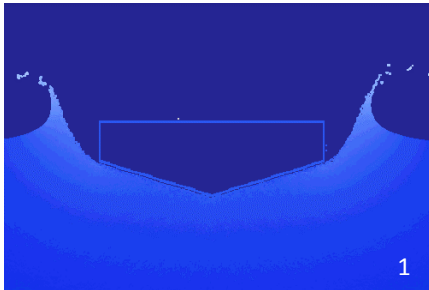


VESSEL HYDRODYNAMICS

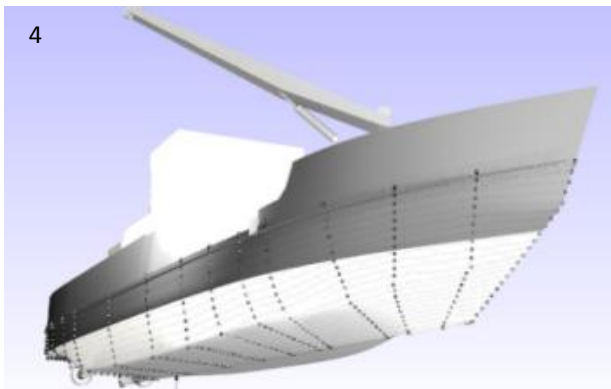
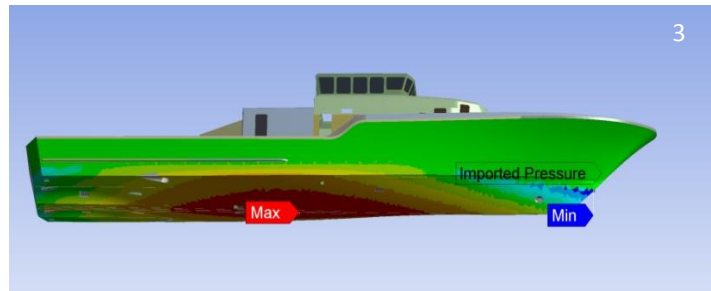


Maine Marine Composites



Engineering...

for the Marine Environment



The ocean environment is challenging in every way. MMC can reduce your risks by analyzing your boat, ship, mooring system, energy converter... whatever system you need to deploy in the water.

Photo Credits: (1) Smoothed Particle Hydrodynamics simulation of vessel slamming. (2) Arctic Challenger barge. (3) FE model of 43m cutter. (4) CAD model of US Coast Guard buoy tender. (5) R/V Hough R. Sharp (Photo: University of Delaware).

MMC specializes in motion prediction for ships and platforms, advanced hydrodynamic analyses, and mooring system design and simulation. Our engineering staff has decades of experience with design and analysis of ships and offshore energy systems, and has successfully completed diverse and challenging projects for many of the most highly regarded offshore and ocean energy companies.

Sample Projects:

- Maine – Mooring and seakeeping response – tidal and river current energy converters.
- BSEE/BOEM – Fatigue analysis of offshore floating wind mooring systems
- Scotland – Simulation and mooring system analysis for barge-transported road segments for Firth of Forth replacement crossing bridge

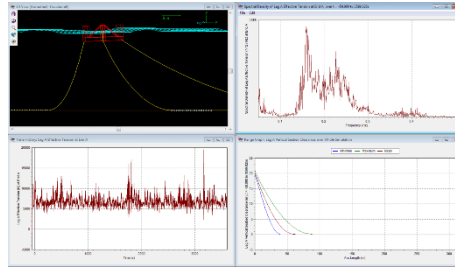
Specialized Services:

- Advanced Hydrodynamics Analysis using CFD, ANSYS Aqwa
- Finite Element Analyses of complex structures and materials
- Mooring System Design and Analysis using OrcaFlex, Aqwa with Cable Dynamics
- Ship and Barge Seakeeping and Stability Analysis using Aqwa
- Analysis and Simulation of Complex Marine Systems using multi-body simulation in OrcaFlex

Meeting Customer Needs, Exceeding Customer Expectations

We offer each customer the right mix of expertise, performance and price. Our staff has expertise in marine, civil, electrical, software and aerospace engineering. Our software analysis capabilities include:

- ANSYS Design Modeler, Rhino3D, MultiSurf, SpaceClaim
 - CAD/CAE models of ocean platforms, hulls, wave and tidal energy converters
- ANSYS-Aqwa with Cable Dynamics
 - Potential flow (Radiation/Diffraction) analyses
 - Determine wave loads, Response Amplitude Operators (RAOs)



- Orcina OrcaFlex
 - Nonlinear finite element mooring model in time domain
 - Coupled with FAST to Analyze Floating Offshore Wind Turbines (FOWT) hydrodynamics including platform, turbine, moorings
- ANSYS Structural Professional
 - FEA of complex structural systems
- NREL FAST and WECsim
 - Simulation of Wave Energy Converters and controllers

Mooring Systems for Demanding Environments

The correct mooring system can make the difference between the success of your project, severe system failure, or the burden of excessive costs. MMC is experienced in the design and analysis of deep water ocean moorings, shallow water wave / wind energy moorings, and river moorings. Our software analysis tools are “best in class,” selected to give you the accurate answers you need on a timely, cost-effective basis. We can help you select the best anchor, embedment, piling or gravity, and the best mooring components, chain, steel, synthetic rope or pipe.

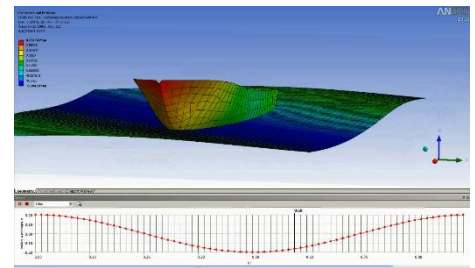


Based on our ongoing research, we can predict the life expectancy of your mooring system and we can help you to develop a maintenance schedule to minimize your operating risks.

Mooring Systems and Vessel Hydrodynamics

- MMC has conducted motions analysis of vessels and offshore systems for a wide range of industries, including:
- Offshore oil and gas
 - Offshore renewable energy
 - Cargo transportation
 - High speed planing craft
 - Government

Our engineering staff has analyzed vessel motions and wave excitations to study hydrodynamic feasibility, loads and accelerations, slamming, seasickness, and spectral fatigue.



MMC staff has assisted a number of naval architecture and engineering firms in ensuring that their vessels and cargo can survive a dynamic ocean environment. Adding MMC to your project team will help to make sure that your vessel is developed and analyzed successfully and arrives safely at its destination.

