

# WEC-Sim (Wave Energy Converter Simulator)

WEC-Sim (Wave Energy Converter SIMulator) is an open-source software for simulating wave energy converters. The software is developed in MATLAB/ SIMULINK using the multi-body dynamics solver Simscape Multibody.

## WEC-Sim Capabilities

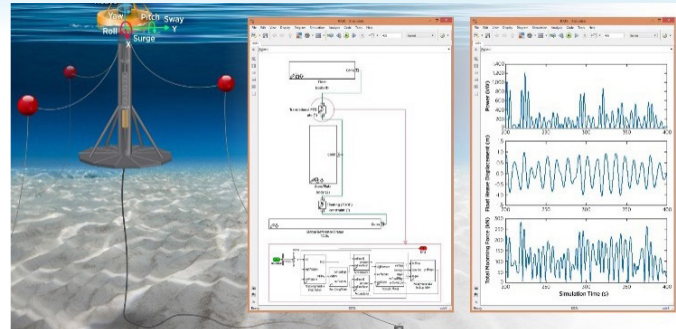
WEC-Sim models a wide range of floating devices comprised of bodies, joints, power take-off systems, and mooring systems. WEC-Sim can model the hydrodynamics of rigid, flexible, and variable geometries. Simulations are performed in the time-domain by solving the governing wave energy converter equations of motion in the 6 Cartesian degrees-of-freedom, plus any number of user-defined modes.

## WEC-Sim Applications Repository

The WEC-Sim [applications repository](#) contains a wide variety of scenarios that WEC-Sim can be used to model, including desalination, mooring dynamics, nonlinear hydrodynamic bodies, passive yawing, batch simulations and many others. The software is quite flexible and can be adapted to many scenarios within the wave energy industry.

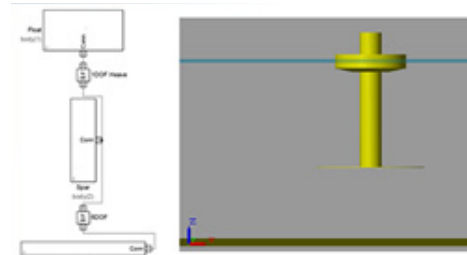
## WEC-Sim Open Source Software

The open-source code for simulating wave energy converters is developed in MATLAB/SIMULINK, with the ability to model devices that are comprised of rigid bodies, joints, power take-off systems, and mooring systems. The WEC-Sim [source code](#) is publicly available on GitHub, and more information can be found in the



Graphic of wave energy converter and WEC-Sim simulation. Courtesy of NLR.

software's documentation. WEC-Sim has regular releases, and maintains stable and development branches of the software on GitHub. Due to its extensive use and impact on the community, WEC-Sim won a 2021 [R&D 100 award](#) for software/services.



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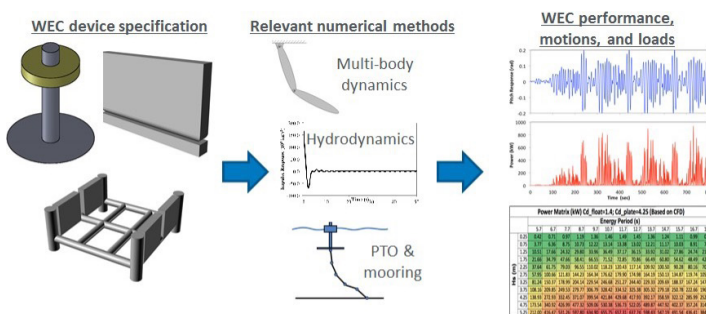
## WEC-Sim Developers

WEC-Sim is a collaboration between Sandia National Laboratories and the National Laboratory of the Rockies, and funded by the U.S. Department of Energy's Water Power Technologies Office. The project is co-led by Adam Keester (Sandia) and Toan Tran (NLR).



## WEC-Sim Teamer Facility

WEC-Sim was established as a [TEAMER facility](#) in 2021, and has since become one of the most requested facilities. The WEC-Sim team regularly supports industry partners through TEAMER awards. Refer to the TEAMER website for information about how to apply for WEC-Sim support through TEAMER.



WEC-Sim modeling workflow. Courtesy of SNL.