

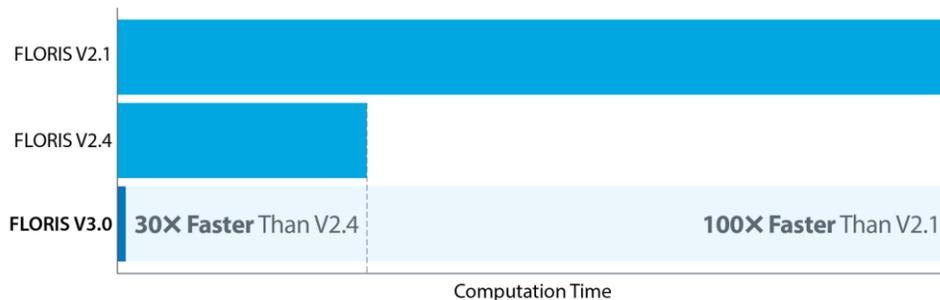
## Announcing FLORIS Version 3.0

The National Renewable Energy Laboratory's (NREL's) Wind Energy Controls Research Team is excited to announce the Version 3.0 release of the [FLow Redirection and Induction in Steady State \(FLORIS\)](#) wind farm controls software. FLORIS optimizes flow control strategies so that existing wind energy facilities can improve productivity and future projects can maximize profits.

The full release of FLORIS Version 3.0 comes after a 6-week beta-testing period during which additional features were added and minor bugs were fixed. Version 3.0 represents a major redesign, rewrite, and enhancement of the open-source software to allow for faster, more accurate, and more varied computations. [Get the quick-start guide](#) to FLORIS Version 3.0, and [view the complete installation instructions](#).

Some of the most significant improvements that are now available to academics, manufacturers, developers, and small businesses include the following.

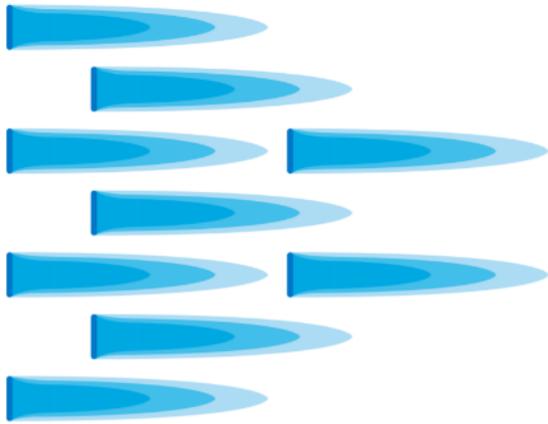
### Improved Computation Speeds for Calculating Wind Farm Annual Energy Production



Due to major upgrades in NREL's latest developmental iteration, FLORIS Version 3.0 (V3.0) can provide users with information much faster than before. *Graphic by Taylor Henry, NREL*

- A complete redesign of the software architecture makes FLORIS Version 3.0 better modularized to foster collaboration and adoption of more modern software best practices.
- By leveraging a larger portion of a computer's processor, FLORIS can now perform many mathematical operations concurrently.
- New algorithms enable improved memory usage and reduce the number of mathematical operations required.

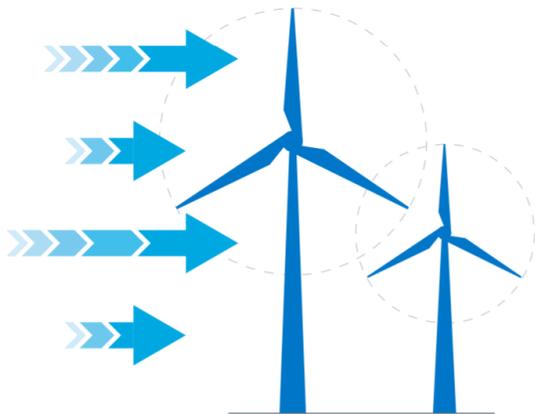
## Enhanced Offshore Wind Farm Models



FLORIS Version 3.0 enables users to improve the accuracy of models for large offshore wind farms, using new models of wake superposition. *Graphic by Taylor Henry, NREL*

- [The new cumulative curl model](#), developed in collaboration with the [National Offshore Wind Research and Development Consortium](#) improves the accuracy of FLORIS's wake models for large offshore wind farms.
- This includes [a new cumulative model for wake superposition](#).

## Mixed-Model Capabilities

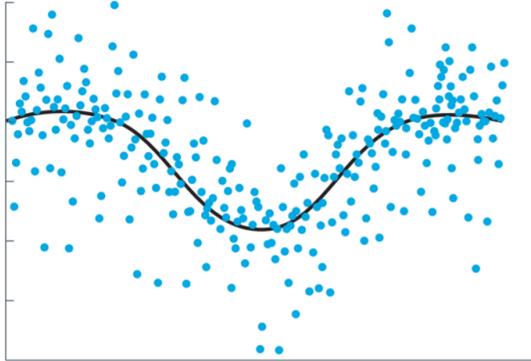


Among other new capabilities, with a framework upgrade and added reference information, users can simulate multiple wind turbine models within one simulation with FLORIS Version 3.0. *Graphic by Taylor Henry, NREL*

- The new FLORIS framework allows specification of different wind speeds in three dimensions for every wind direction. This enables layout optimizations based on speed-up areas as well as arbitrary inflow profile modeling.
- Support for various wind turbine models in a single simulation is now available, along with a wind turbine reference library.

## FLASC Companion Repository

FLORIS-based Analysis for SCADA (FLASC)



Also new for users is the release of FLORIS-based Analysis for Supervisory Control and data acquisition (SCADA) data (FLASC), which includes FLORIS-to-SCADA data comparison. *Graphic by Taylor Henry, NREL*

- Version 3.0 includes the initial release of FLORIS-based Analysis for Supervisory Control and data acquisition (SCADA) data ([FLASC](#)), a companion open-source repository.
- FLASC implements the methods used in NREL’s research for field data postprocessing, model analysis, and FLORIS-to-SCADA data comparison.

### Next Steps

Following the Version 3.0 release, ongoing development of FLORIS will continue. Upcoming features include:

- [An implementation of the updated TurbOPark model](#), which expands upon the previous version seen in FLORIS Version 2.4 based on top-hat wake profiles.
- The ability to couple with hybrid plant models for modeling wind energy, solar power, and energy storage facilities in addition to performing optimizations
- Axial-induction-based wind farm controller modeling
- Continuous improvements to wake models
- Further improvements to computational speed
- A web-based preprocessing dashboard.

For a quick look at FLORIS Version 3.0, view the [Getting Started Notebook](#).

As always, the team remains open to and appreciative of the user community's feedback. If you have additional input, no longer wish to receive updates on FLORIS, or just discovered FLORIS and would like to start receiving updates, please send an email to [Paul.Fleming@nrel.gov](mailto:Paul.Fleming@nrel.gov).

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