

# New Features to the Trinity of GLM R-packages: glmtools, GLM3r and GRAPLER

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Join the  
GLM slack!



## glmtools

### Short description

To interact with GLM, especially to extract information from the model

### How to get the new features?

`devtools::install_github('hdugan/glmtools')`  
But soon on '[USGS-R/glmtools](#)' (main)

### Overhauled visualization

New visualization options help you to

- Create beautiful contour plots of every simulated variable
- Compare simulated and observed data using improved contour plots
- Modify plot aspects as you like, e.g. moving the legend, increase font size, change color palettes
- Everything was overhauled to run on the ggplot2 engine

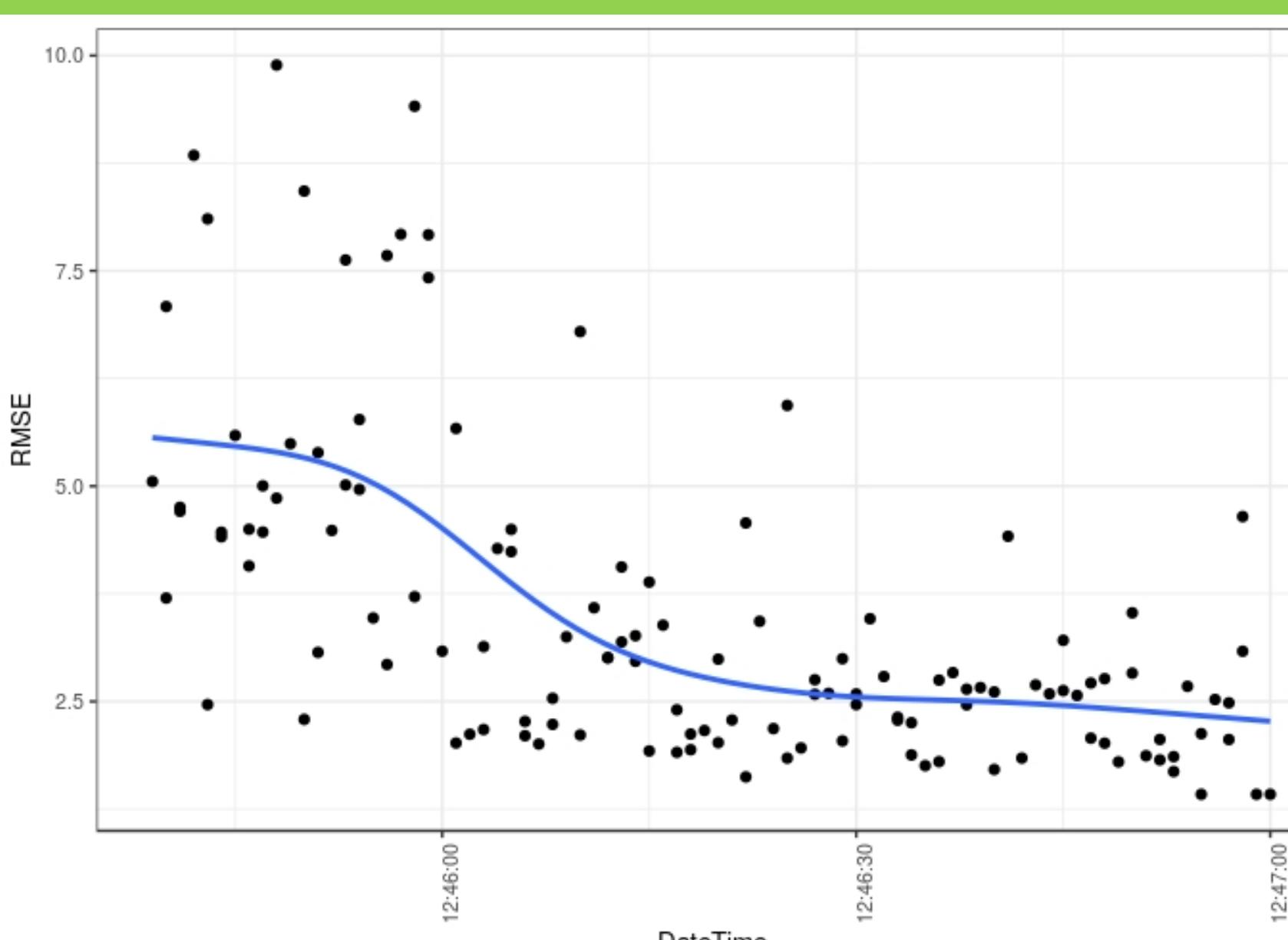


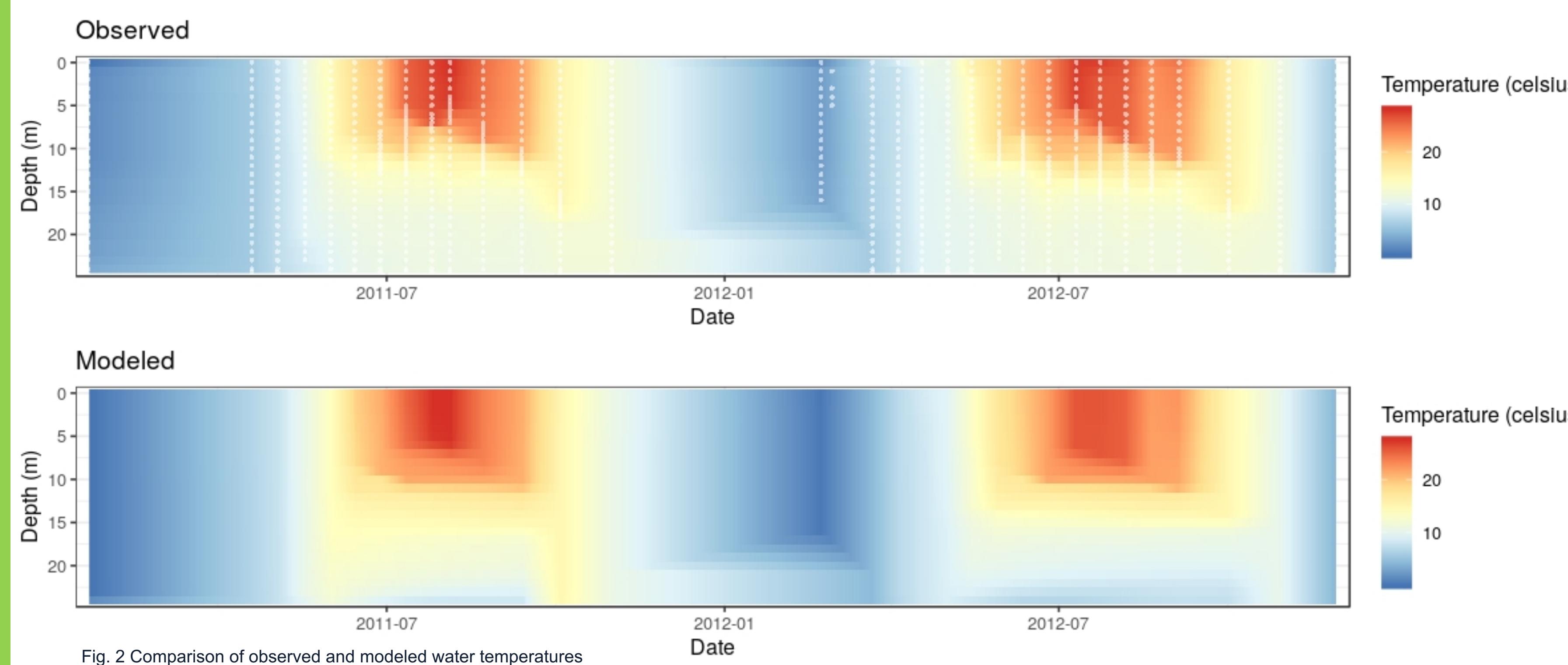
Fig. 3 Achieved RMSE fits of the CMA-ES algorithm over 150 iterations

### Automatic calibration

The new functions allow you to choose from two derivative-free methods:

- (1) Nelder-Mead (simplex-hill)
- (2) CMA-ES (evolutionary algorithm)

The routine will save all iterations in a CSV-File and visualize the model fit using a diagnostics plot



### Planned features for 2020

- Sensitivity analysis
- More options for calibration metrics
- Tutorials and vignettes

### Want more features?

Add a feature request by writing an issue on  
<https://github.com/USGS-R/glmtools>

## What is GLM?

GLM (General Lake Model) is a vertical 1D hydrodynamic numerical model, which simulates water balance, mixing and stratification dynamics. The model was developed by Matt Hipsey, Louise Bruce and Casper Boon at UWA, Australia. The software is open-source and the code is accessible for modifications.

### Combining GLM and R

There are three R-packages that support the work with GLM. Here we are presenting recently added features to these R-packages, mainly the switch from GLM v.2 to v.3.

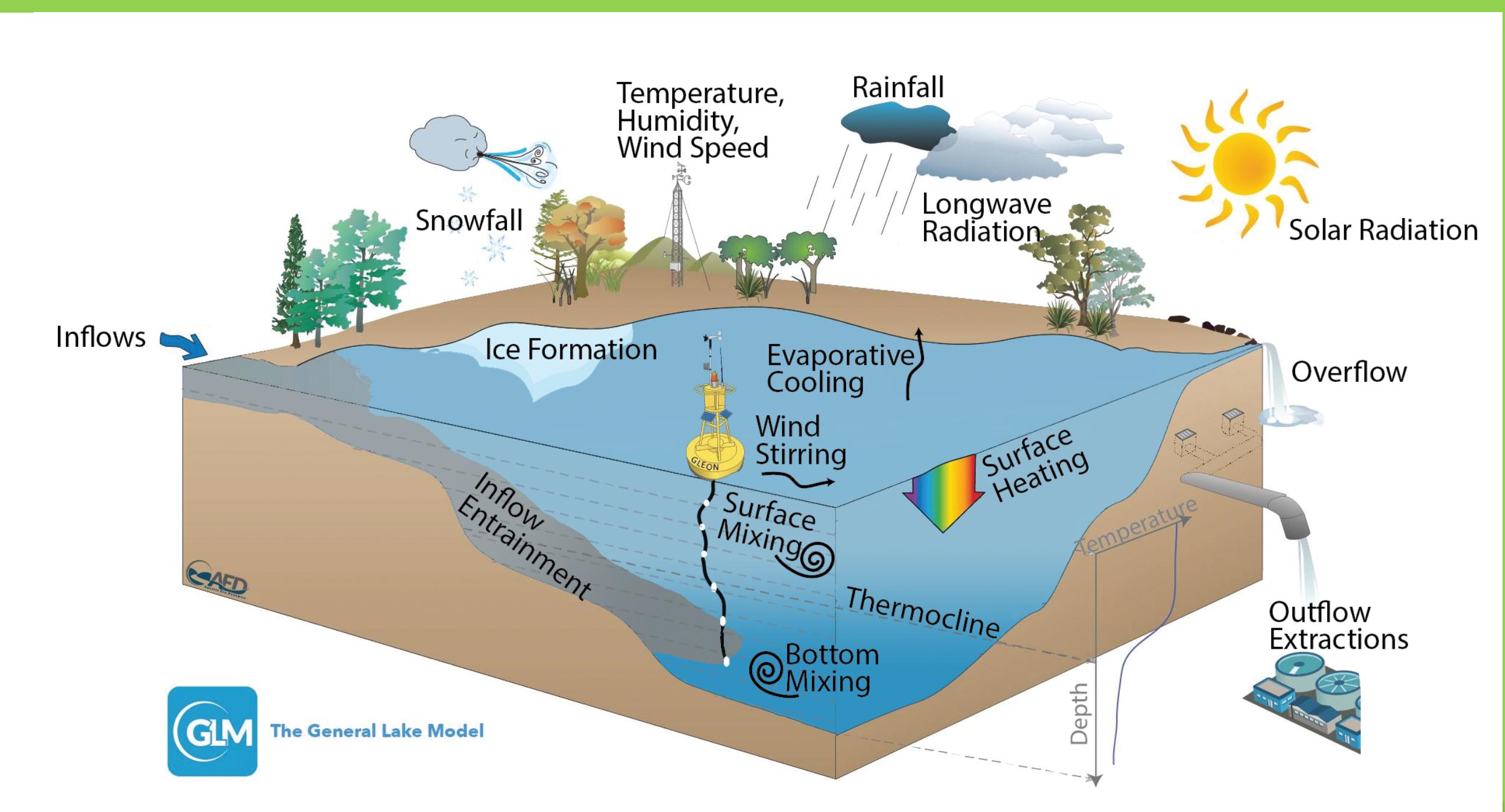


Fig. 1 Overview of processes that can be simulated by using GLM

## GRAPLER

*the experimentalist*

## glmtools

*the processor*

## GLM3r

*the engine*

## GLM3r

**How to get the new features?**  
`devtools::install_github("GLEON/GLM3r")`

**What can it do and what is new?**  
Runs GLM v.3.0.5 in R

## GRAPLER

### Short description

Distributed computing system that allows submission of a magnitude of GLM simulations.  
→ GRAPLER runs these jobs efficiently and is therefore suited to explore a variety of scenarios

### How to get it?

`devtools::install_github("GRAPLE/GRAPLER")`

### What is new?

Allows you run either GLM v.3.0.0 or v.2.1.8

## ACKNOWLEDGEMENTS

Due to the open-access approach of GLM and R, many people have supported the development of these tools (or their respective predecessors).

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Here you can find a tutorial and data: <https://bit.ly/2P2KyEB>