
The HOBO rain gauge is a tipping bucket type, which marks time and date for each 0.2 mm of liquid precipitation.


Sediment sampling from lake bottoms to reconstruct previous floods. With these results we can calibrate models in future work in **HORDAKLIM** and **R3**.


# Downscaling an intense precipitation event in complex terrain: The importance of high grid resolution

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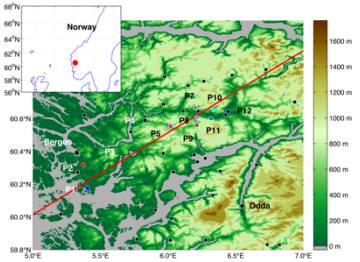
## October 2014 flooding

Several days of consecutive precipitation in late October led to a major flooding in large parts of western Norway. This study examines three model simulations of the intense precipitation four days ahead of the flooding.

## Study area




A series of WRF simulations are compared to a network of 11 HOBO rain gauges (coloured circles) and 43 met.no stations (black squares) in western Norway. We investigate three simulations with grid resolution of 9 km, 3 km and 1 km. The aim is to find a grid resolution which ensures a reliable representation of local scale phenomena, but yet minimizes computational demands.

## Read more ?

Pontoppidan et al. (2017). Downscaling an intense precipitation event in complex terrain: The importance of high grid resolution, *Tellus A*.

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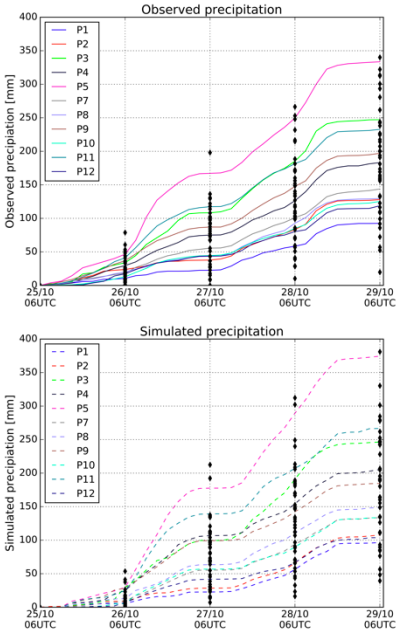
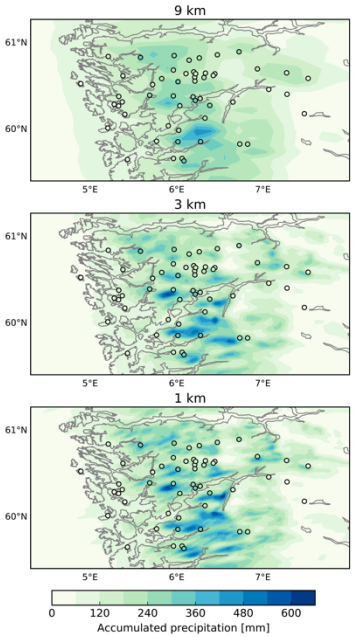
## Observed and simulated 4-day precipitation

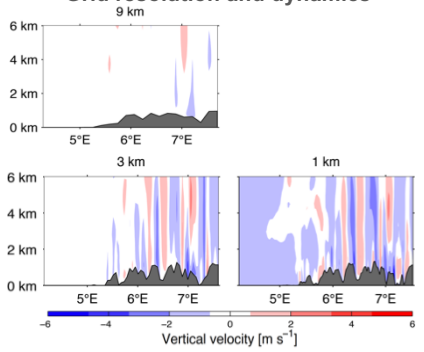



Observations from HOBO rain gauges (coloured lines) and met.no stations (black diamonds) shows intense precipitation periods and large horizontal variability. The simulation replicates the observations well.




Simulated precipitation (contours), and station network (circles) filled with observed values. The 9 km grid run lacks variability and the higher precipitation amounts. The 3 km and the 1 km are similar, with confined areas of up to 600 mm of precipitation and local scale differences of above 300 mm.

## Grid resolution and dynamics




9 km grid size is insufficient to resolve the important length scales for gravity waves in the area, the terrain is coarsely represented. The 3 km grid size is quite similar to the 1 km, they both resolve important wavelengths for gravity waves, hence orographic precipitation.

## Conclusion and ongoing work

The 3 km run resolves the important wavelengths for orographic enhanced precipitation in western Norway. We believe this result can be generalized and that a 3 km grid is sufficient to simulate intense local scale precipitation events. Ongoing *climate projection projects* as **HORDAKLIM** and **R3** will proceed on these findings.

## Acknowledgements

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