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Precipitation downscaling on the west coast of Norway: Comparison with observational network

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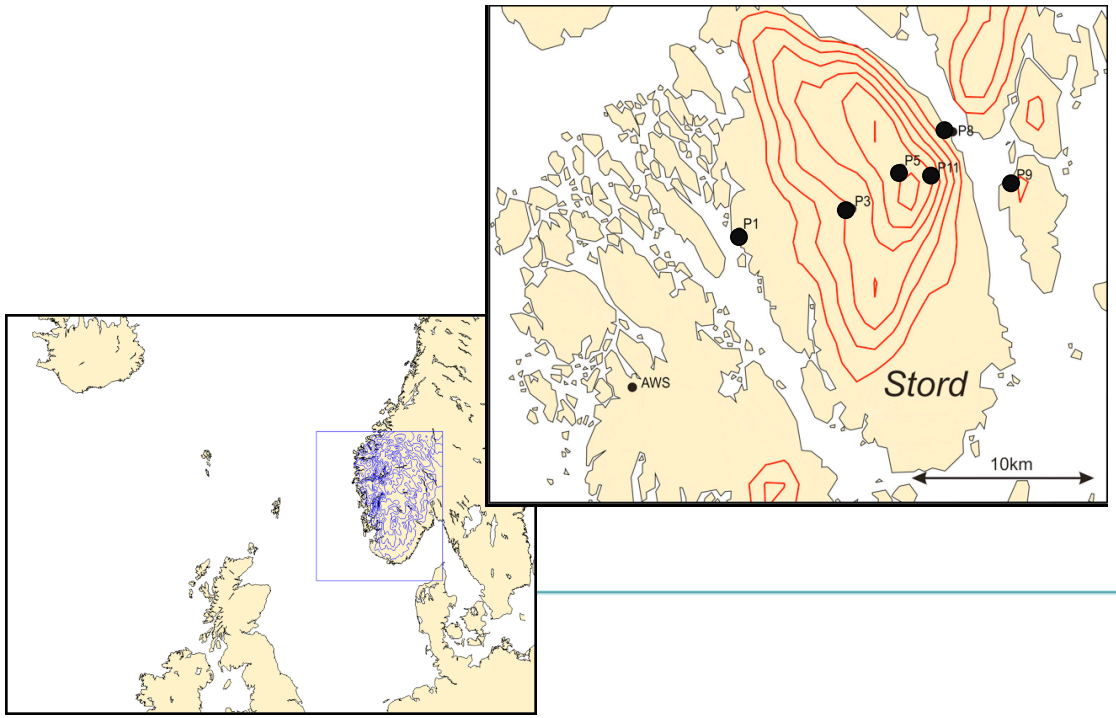
Experimental setup

- Observations
  - obs. period 9/2005 – 11/2005 (7 weeks)
  - high frequency obs. ≈ model time step, grid spacing



- Model setup
  - 2 nested domains: 10 km – 3.3 km
  - 40 vertical levels
  - boundaries: ECMWF
  - FDDA nudging
  - 2 mp-schemes:

    “mp3” 3-class

    “mp10” Morrison

Wet events / Total accumulation

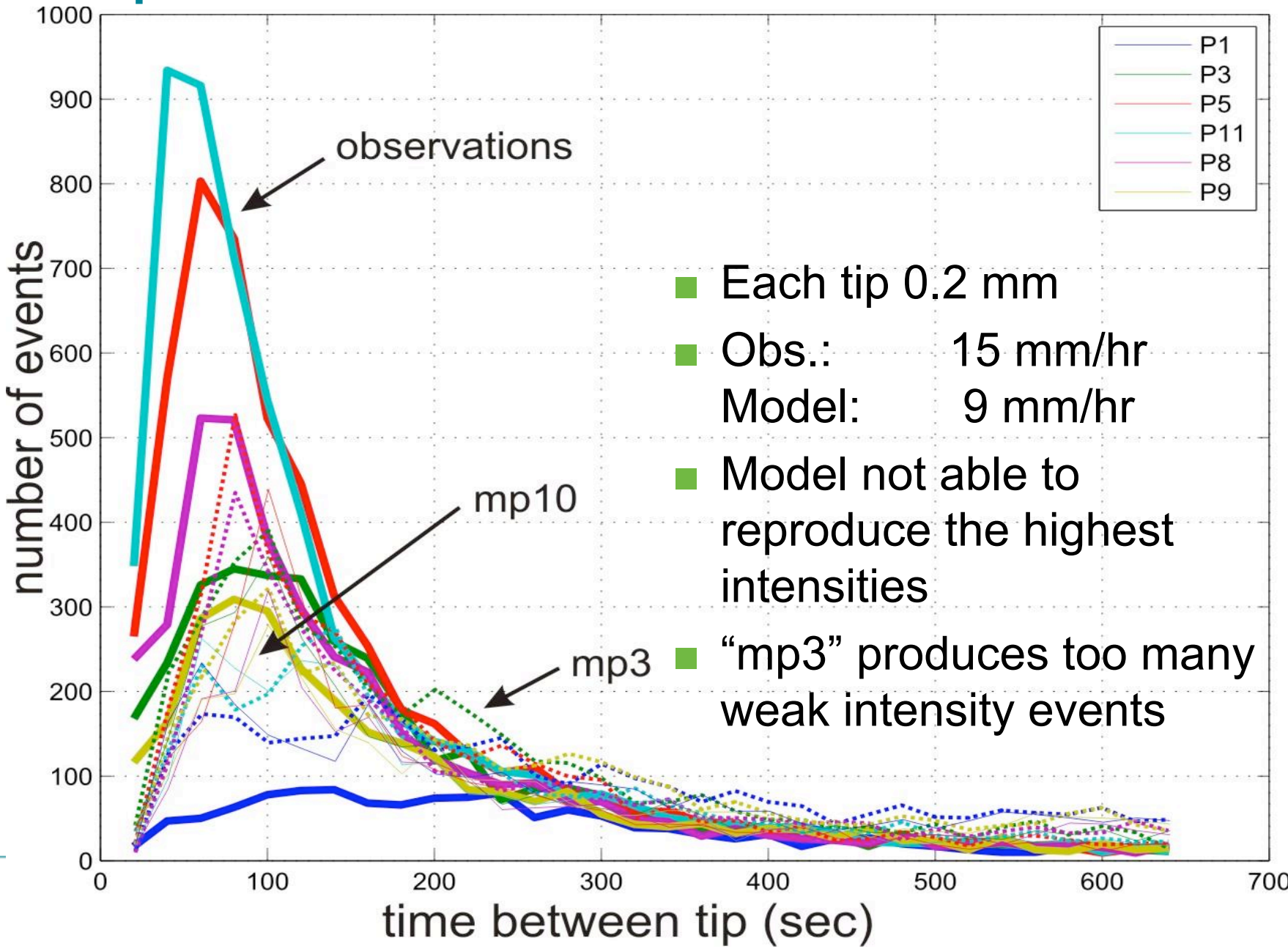
- Model overpredicts the wet events
- Total accumulated precipitation mainly too low
- “mp3” performs better top / leeside slope stations, “mp10” on upwind slope / flat land

Station/measure	Wet (%) – 10min (mp3/mp10)	Wet (%)- 1hr (mp3/mp10)	Wet (%)- 3hr (mp3/mp10)	Wet (%) – 24hr (mp3/mp10)	Total accumulated (mm) (mp3/mp10/**obs**)
P1 upwind-flat land	525/443	283/252	200/189	122/122	787/729/**333**
P3 upwind-slope	360/311	215/200	156/150	115/113	927/766/**768**
P5 top	307/266	199/185	149/143	105/102	927/766/**1120**
P11 leeside-top	284/234	169/152	130/123	100/100	864/700/**1220**
P8 leeside-slope	357/286	224/199	170/161	116/116	856/676/**838**
P9 leeside-flat land	362/289	220/194	167/159	113/116	804/634/**640**

Conclusions

- Model rains too often and too little (both schemes)
- Morrison scheme overestimates wet events less than 3-class scheme
- Total accumulated precipitation:
  Morrison better on flat land
  3-class better in complex terrain (produces more precipitation anyway)

Precipitation intensities



- Each tip 0.2 mm
- Obs.: 15 mm/hr
  Model: 9 mm/hr
- Model not able to reproduce the highest intensities
- “mp3” produces too many weak intensity events