

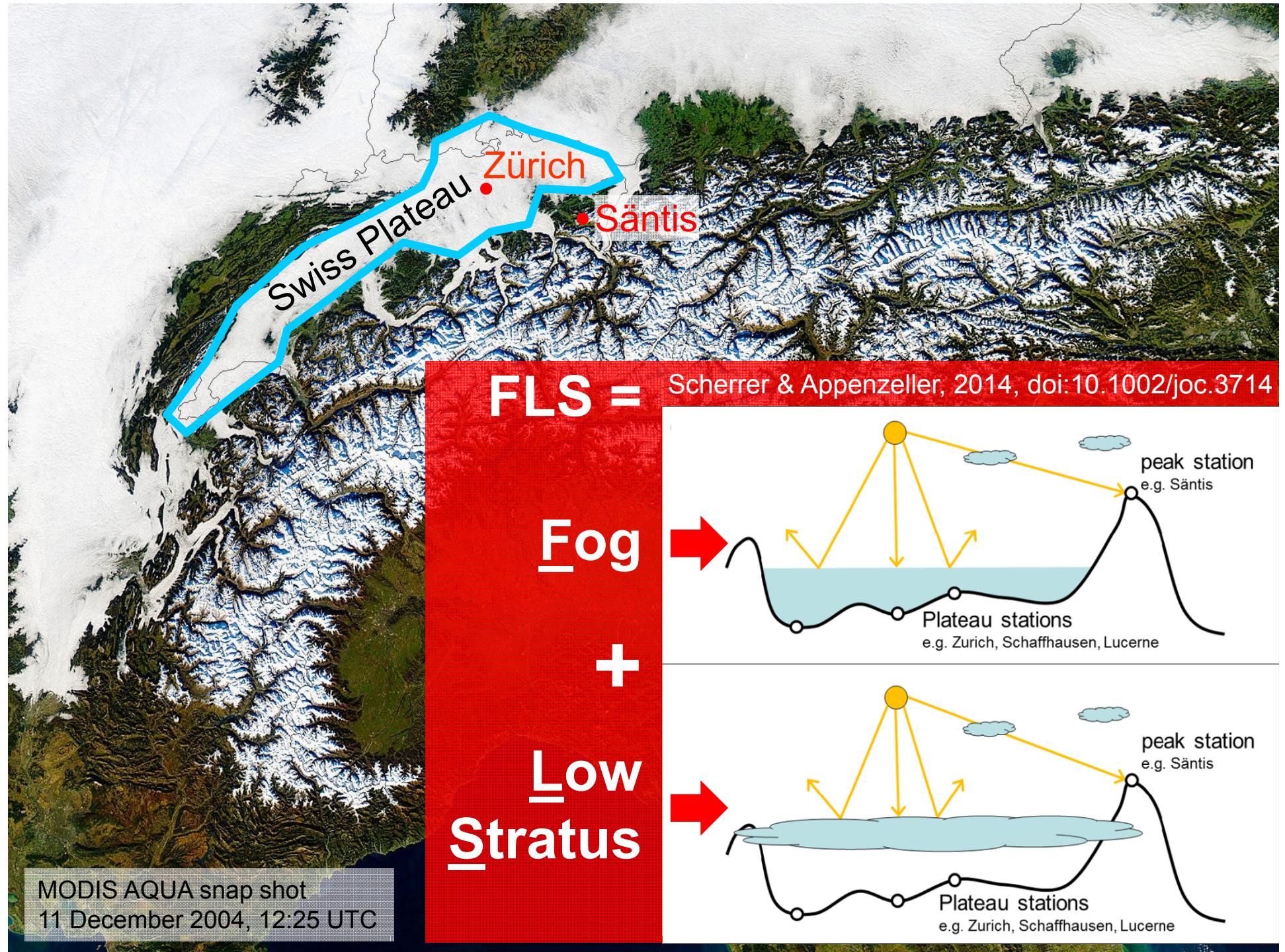


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# Variability & trends of fog and low stratus (FLS) over the Swiss Plateau: The role of circulation types

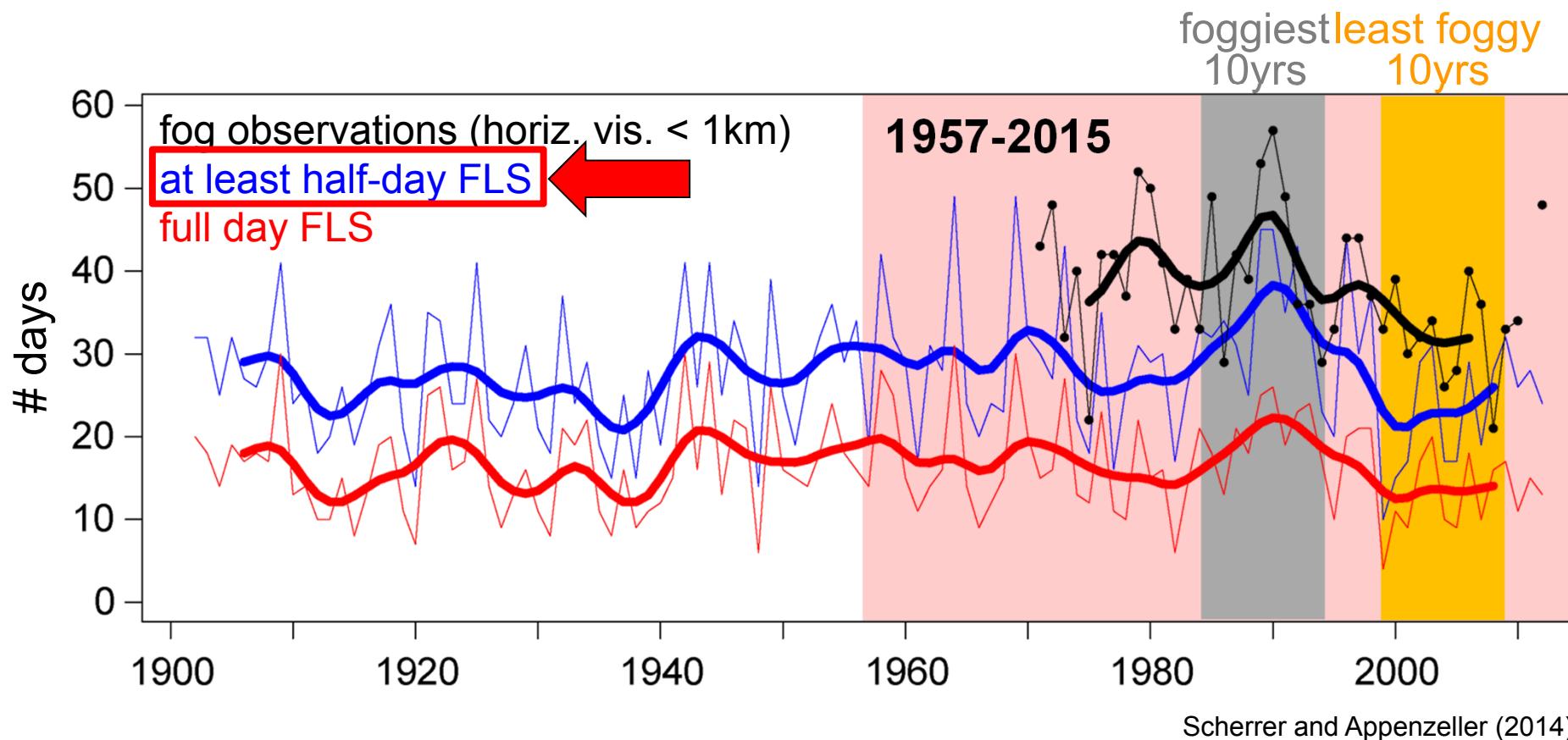
**Yasmin Rosskopf, Simon C. Scherrer,  
Cornelia Schwierz & Tanja Weusthoff**





# Reconstructed fog/low stratus (FLS) series

September – March in Zurich





## Key question

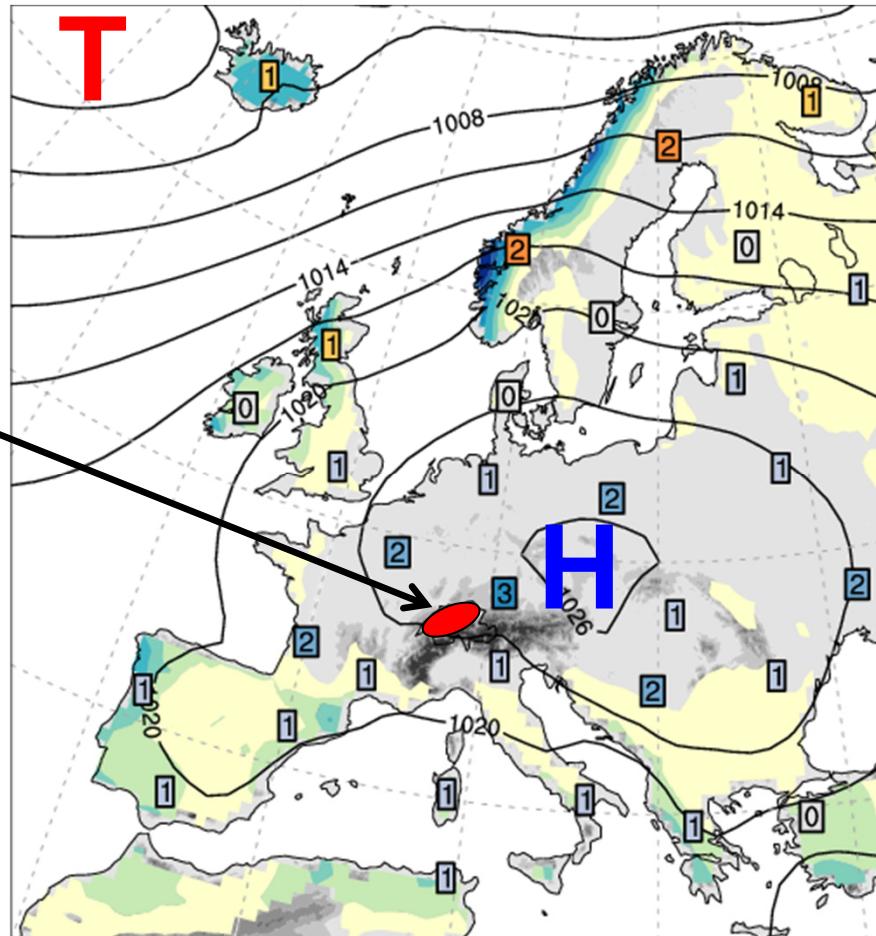
Can the FLS variability and trends mainly be explained by the variability of the occurrence frequency of weather type classes?

- 1) Does the occurrence frequency of most fog-prone classes vary/change in a similar way as the FLS?
  
- 2) Is the FLS fraction (ratio of FLS-days to all days in a certain weather class) changing systematically over time?  
→ *If yes, hint for importance of other effects than just changes in occurrence frequency of weather classes*



# FLS composite (all FLS days 1957-2015)

FLS  
here!



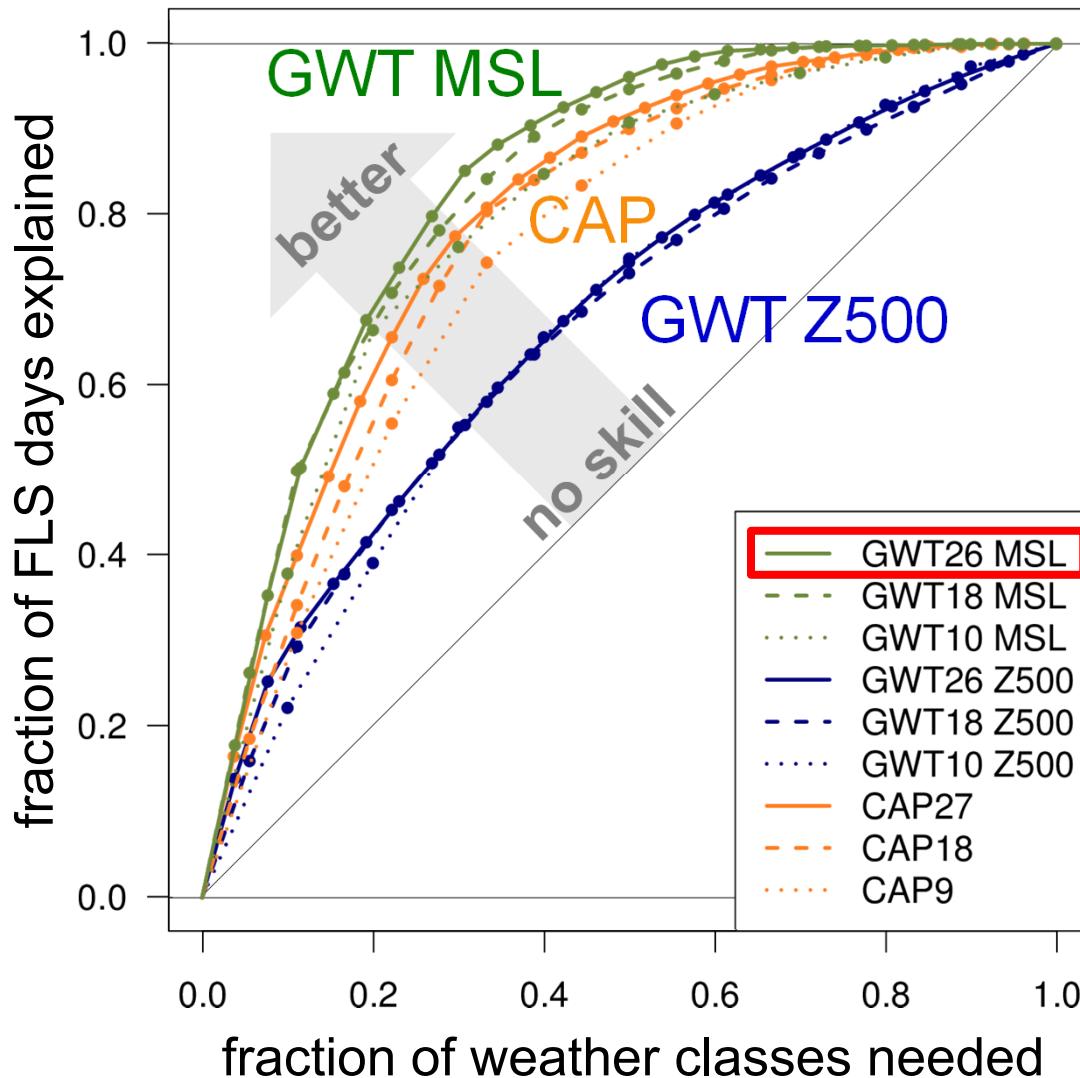
- high pressure NE of CH
- small pressure gradients
- negative temp anomalies
- no precipitation

	Unit	Presentation
Surface temperature	K	boxes: red (blue) represent warm (cold) anomalies
Sea level pressure	hPa	black contour lines
Precipitation	mm/d	colour shaded contours (see legend)

1 2 3 4 6 8 10



## Discrimination FLS/non-FLS days: «best» WTC



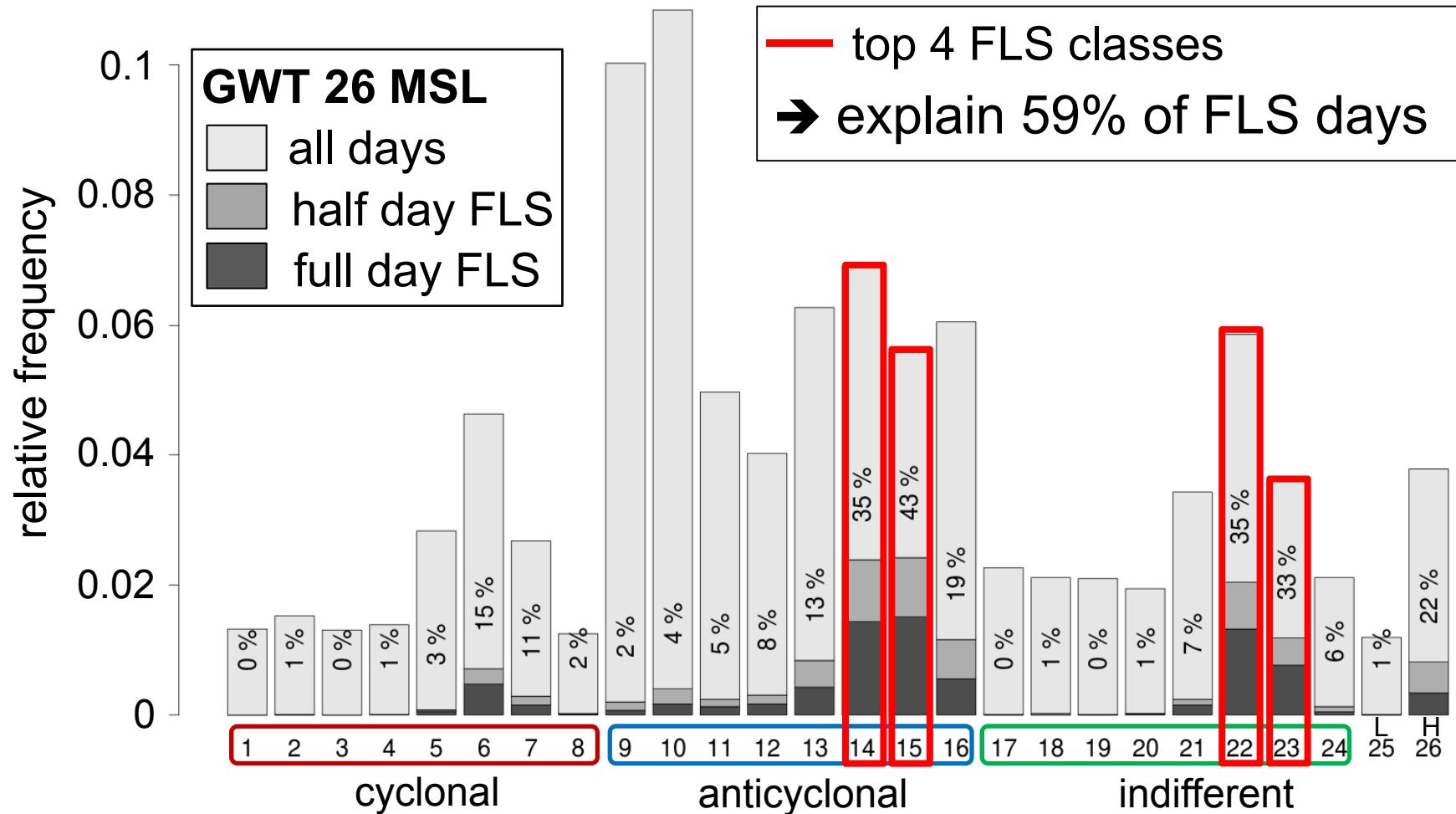
MeteoSwiss:  
10 automated WTCs  
→ 9 out of 10 from





# GWT26 MSL classes & relative FLS frequency

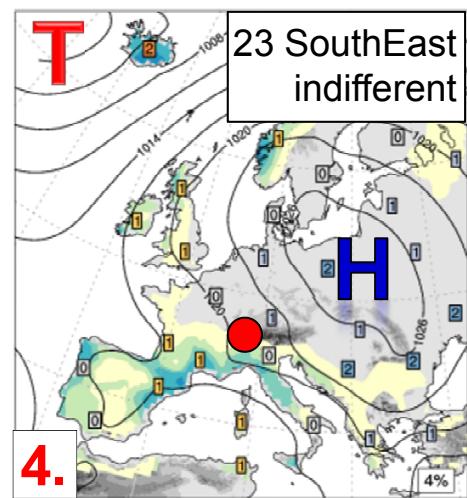
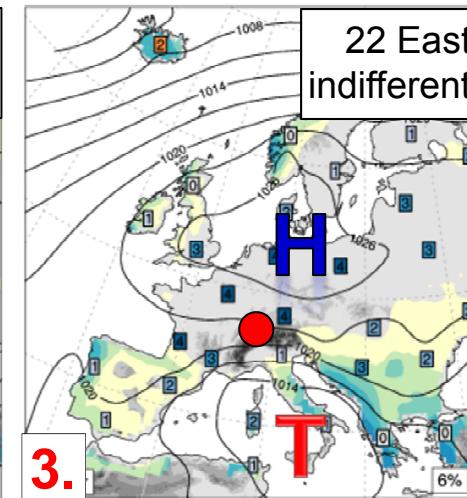
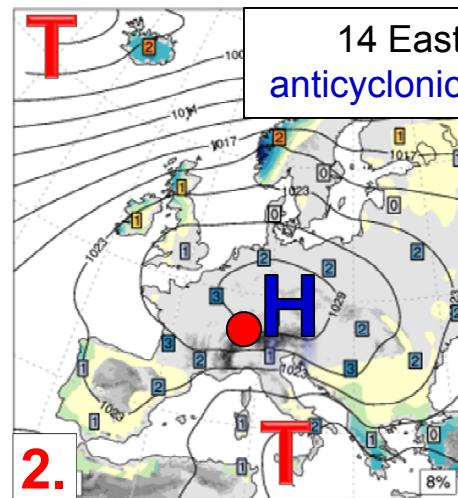
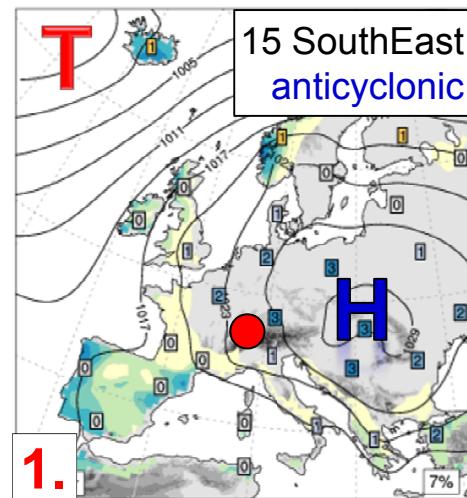
Sep-Mar, Zurich



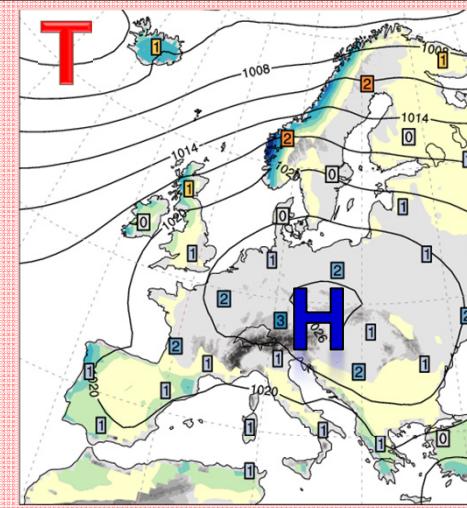


# «Top 4» FLS linked GWT26 MSL classes

Sep-Mar, Zurich



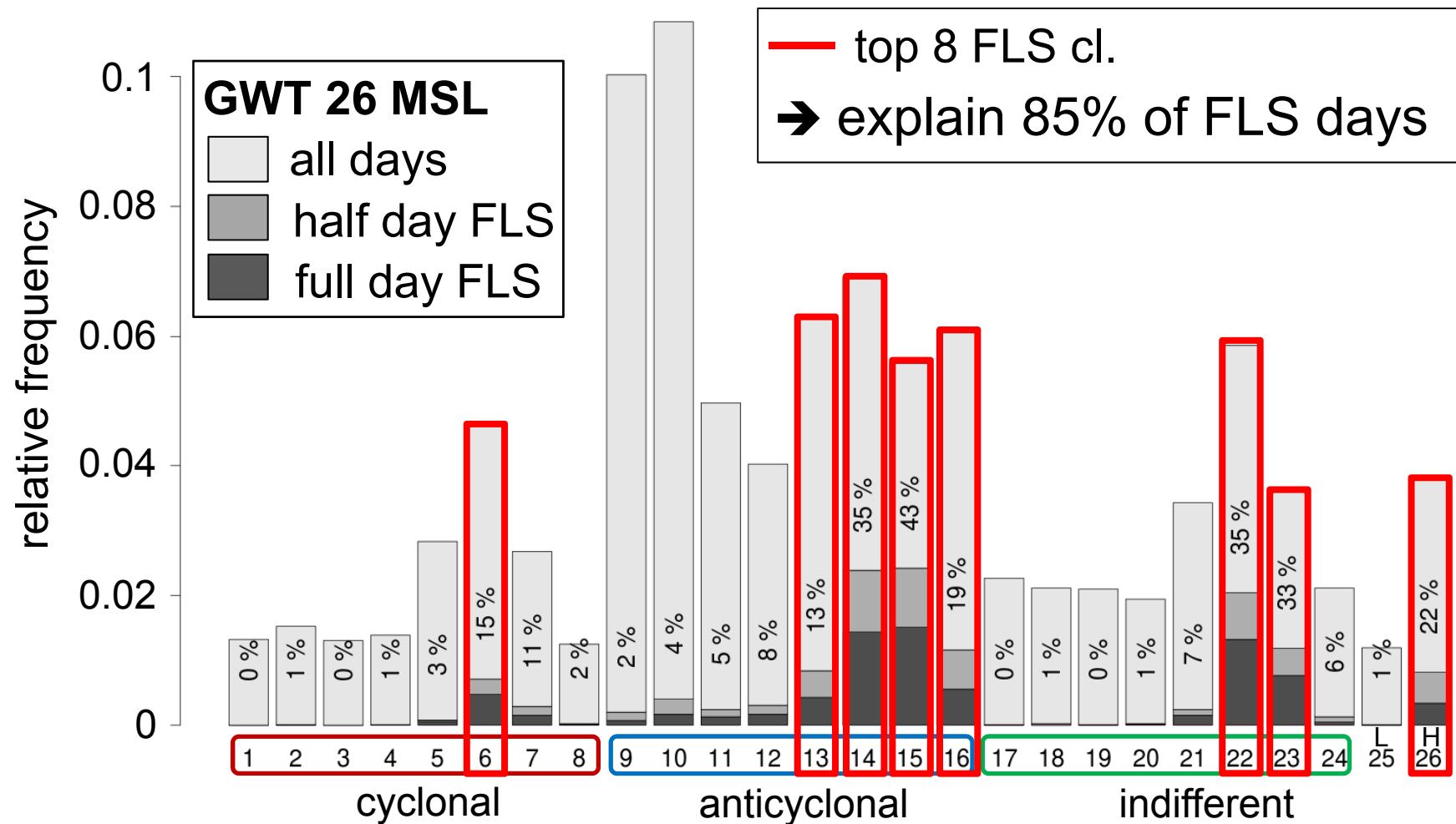
all FLS day  
composite





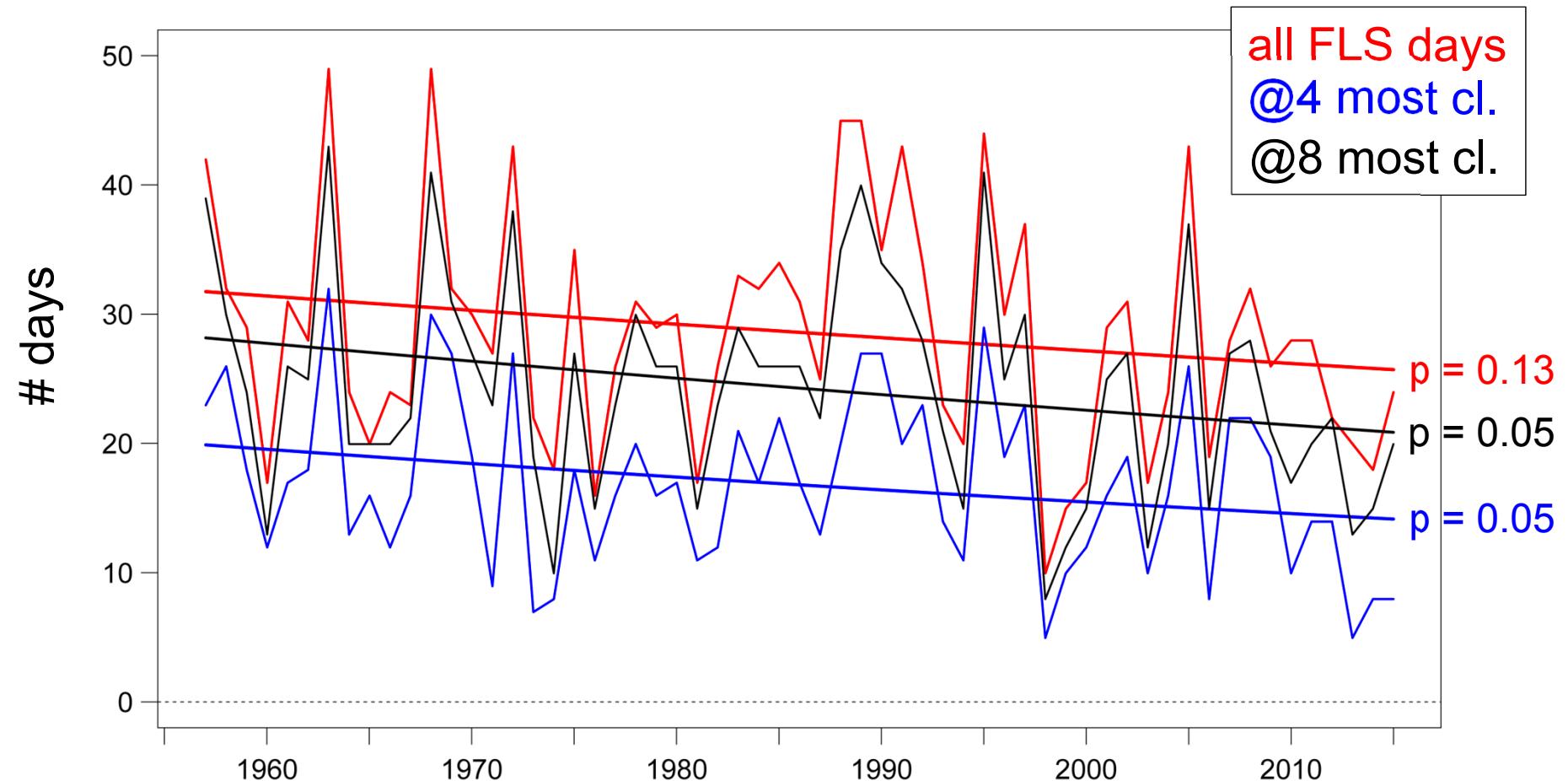
# GWT26 MSL classes & relative FLS frequency

Sep-Mar, Zurich





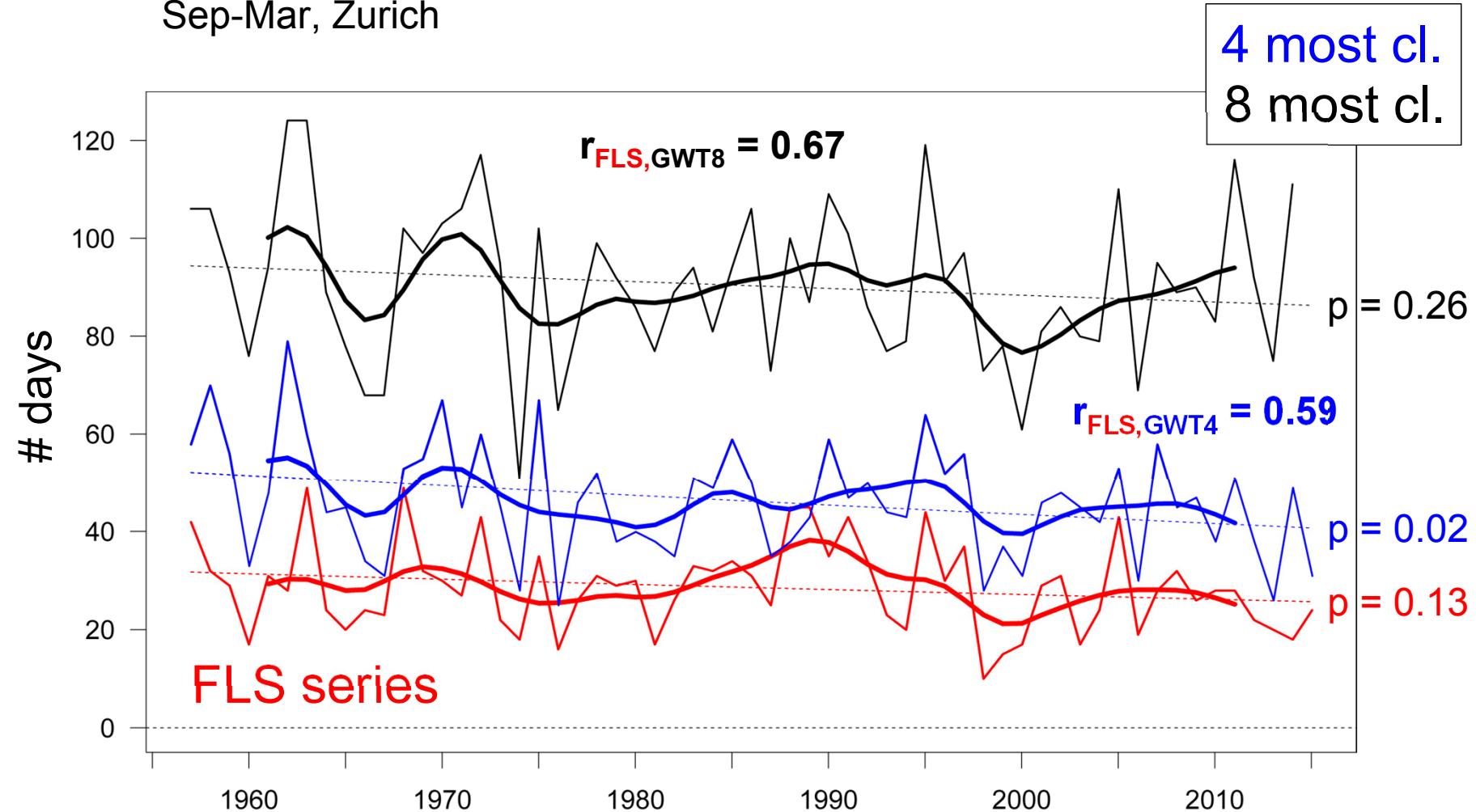
# FLS days: all, 4, 8 most fog-prone classes





# Occurrence frequency analysis

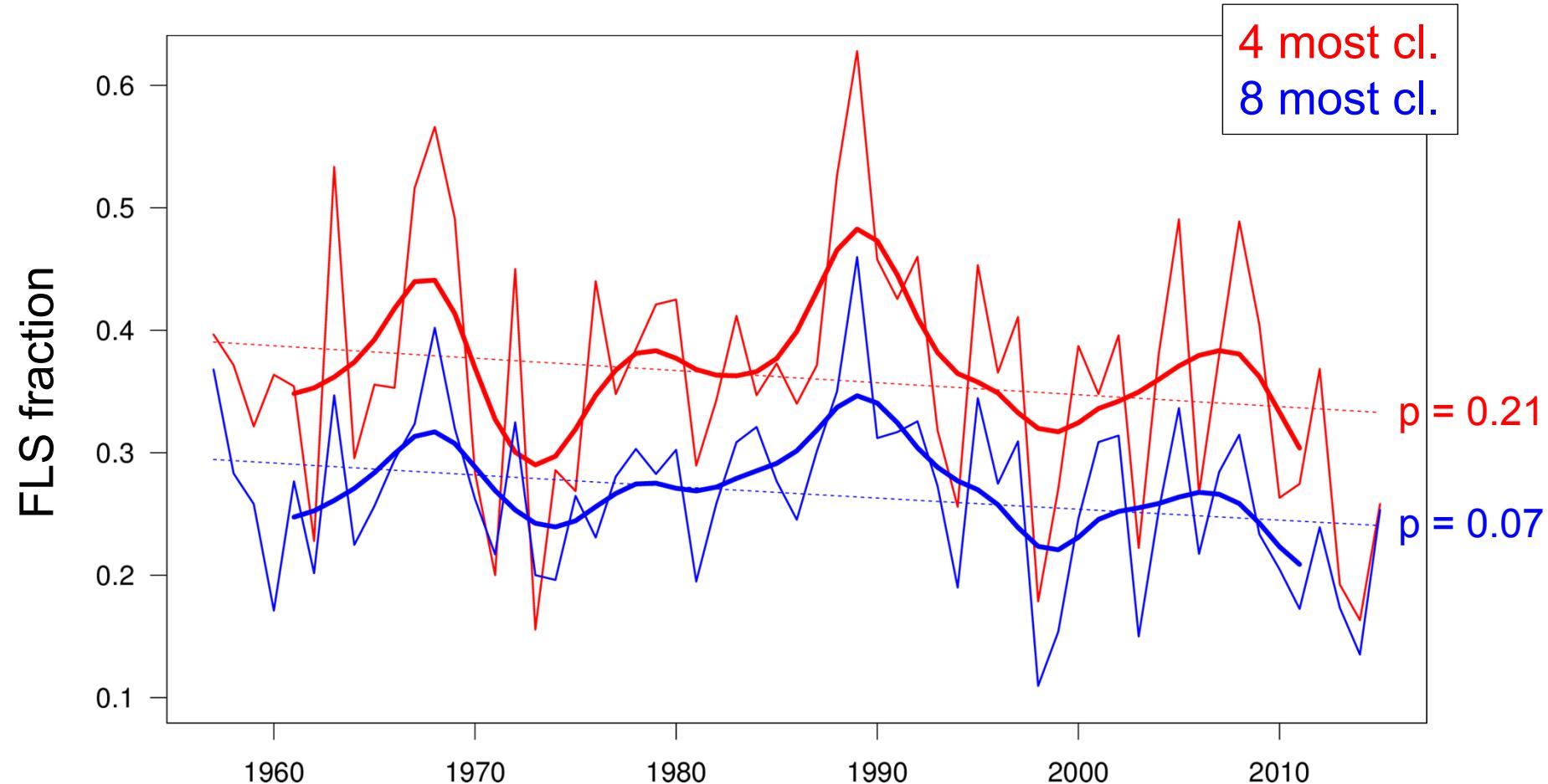
Sep-Mar, Zurich





# FLS fraction analysis

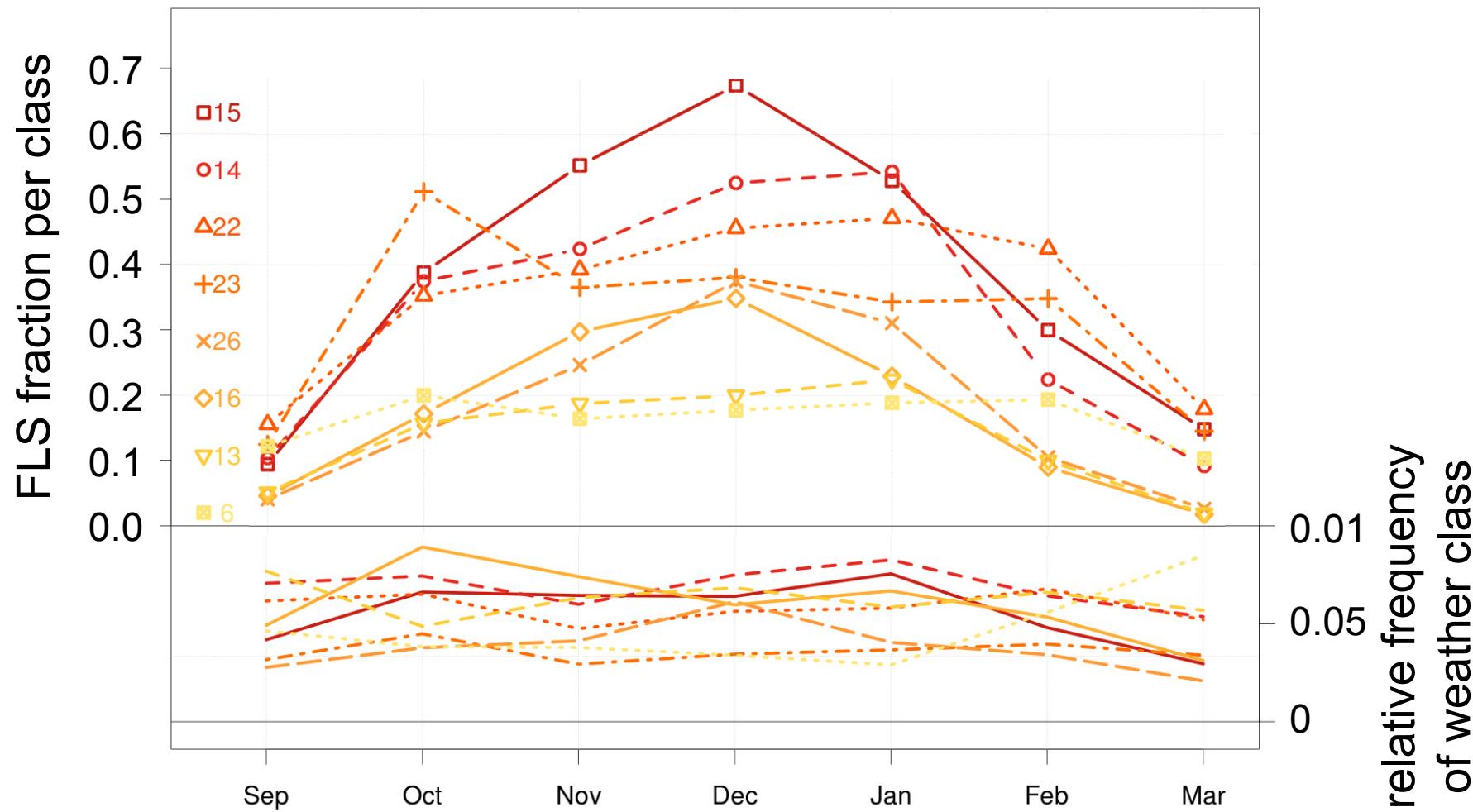
4 / 8 most fog prone GWT MSL 26 classes





# Monthly variability of FLS fraction

8 most FLS-prone classes





# Summary

- FLS situations characterised by high pressure over C-Europe, small Press gradients, neg. T anomalies, no Precip
- Discrimination between FLS and non-FLS days using WTCs works better with
  - MSLP than Z500 based WTCs
  - WTCs with many classes (26, 27 instead of 9, 10 or 11)
- Inter-annual FLS variability is mainly determined by occurrence freq. of most FLS-prone weather classes
- However, the influence of other effects on FLS variability cannot be excluded & needs further investigation  
→ pollution, humidity fluctuations, seasonal shifts?