

The 2018 #DROUGHT in Switzerland

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WSL-Initiative
Trockenheit
Drought



How predictable?

- Is it worth the effort to use **monthly forecasts** as an **early indicator** for upcoming dry periods?
- Do they have skill, resp. **are they reliable** at all?
- When and where did they show the 2018 drought?

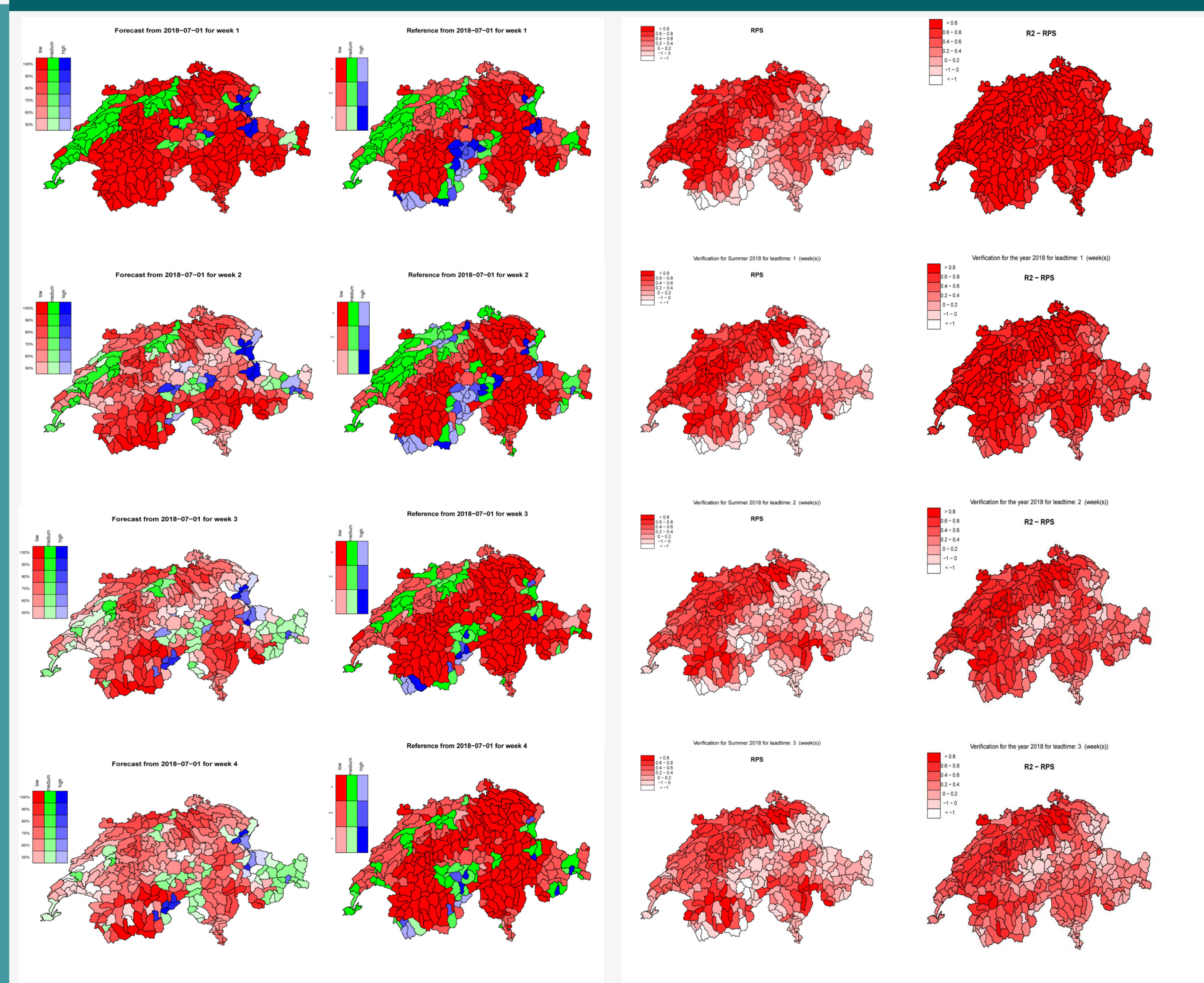
The skill of the monthly forecasts shows some spatial variability. Especially catchments with glaciers are more difficult to predict

Variables with short reaction times (surface runoff) are predictable for 1-2 weeks in advance, which can be enhanced using post-processing methods

For slower reacting variables (baseflow) the skill of the forecast lasts for up to 4 weeks

The skill of the Summer 2018 period was higher compared to the long-term predictability (with very stable atmospheric conditions)

Monthly forecasts are gainful, already end of June the forecasts show some possibilities of dryness for the coming weeks (however site and variable dependent) and post-processing increase the forecast skill



Example of a tercile forecast (i.e. likelihood of the forecast to be below, close to or above the long-term averages) end of June for the upcoming four weeks on the left. The right side shows the reference model simulation with measured meteorological input for the corresponding weeks.

Quality of the forecast expressed as Ranked Probability Score (RPS), with a perfect forecast in dark red. The lighter red, the lower the skill in comparison to a climatological forecast. On the left side the results of the surface runoff are shown for the Summer 2018, on the right side the results for the baseflow are shown after post-processing for the year 2018

Literature

S. Monhart, M. Zappa, C. Spirig, C. Schär, and K. Bogner. Subseasonal hydrometeorological ensemble predictions in small-and medium-size mountainous catchments: Benefits of the NWP approach. *Hydrology and Earth System Sciences*, (23):493–513, 2019.

K. Bogner, K. Liechti, L. Bernhard, S. Monhart, and M. Zappa. Skill of Hydrological Extended Range Forecasts for Water Resources Management in Switzerland. *Water Resources Management*, 2017.