drought.ch - Swiss platform for early detection of drought

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Introduction

In recent years Switzerland has experienced some unprecedent drought situations. At a political level solutions have been requested for early recognition of hydrological droughts. A prototype information platform has been developed to guide water resources management during situations where water resources drop below critical levels. The development was steered by stakeholders from national administrations and different economic sectors. Since June 2013 the platform has presented daily updated real-time information on several drought indicators including precipitation, streamflow, lake levels, groundwater levels, soil moisture deficit, snow resources, dryness in forests and stream temperatures. Information for earch variable has been used to create automatic "awareness maps" for nine large regions. Three levels of information with increasing detail and complexity can be accessed by over 400 registred users. The operators of the platform give interpreted comments on the content of the platform each week-day.

The currently implemented COSMO-LEPS forecasts are used for the upcoming five days. In addition, since April 2015 monthly ENS-forecasts were integrated experimentally. These two prediction systems have now been evaluated for the heat wave of summer 2015 and compared to the climatological forecasts.



How to present drought?

nation Kontakt Feedback	· · · · · · · · · · · · · · · · · · ·	
Willkommen auf drought.ch — die Informationsplattform zur Früherkennung von Trockenheit in der Schweiz	Trockenheit News #trockenheit / #secheresse on Twitter	
Die Plattform ist ein Forschungsprojekt des Nationalen Forschungsprogramms 61 und wird in Zusammenarheit, mit dem BAELL und der	 <u>Gefährdungsdossier Trockenhe</u> (<u>risk-ch.ch</u> - <u>@alertswiss</u>) 	
Actuelle Situation Vorhersagen (Browserempfehlung: Firefox oder Chrome)	 2. September 2016: Waldbrandgefahr und Hitze (SRF) 8. August. 2016: Trockenheit a Mallorca (Spiegel-Online) 28. Juni 2016: Rekordtrockenh wie Herbst 2015 dieses Jahr unwahrscheinlich (SRF) 7. Mai 2016: Waldbrand in Kanada wegen Trockenheit ausser Kontrolle (SRF) 26. April 2016: Interessante Se betreffend Vorregen (Schweize Hagel) 1. April 2016: Wenn Ozeane 	
	Feuer bringen (<u>NZZ</u>) 29. März 2016: Trockenheit 20	
	und Borkenkäfer in 2016 (<u>Der</u> <u>Bund</u>)	
	 25. Feb. 2016: Seeforellen und Trockenheit (<u>ZSZ</u>) 	
stände und Quellabflüsse mit sinkender Tendenz, jedoch	23. Feb. 2016: Kt. Bern: Kurze Flut, lange Ebbe (DerBund)	
	22. Feb. 2016: Trockenheit 201	
Beaingungen im Suden (siehe <u>Monatsausblick)</u>	in der <u>Tschechische Republik</u> 22. Feb. 2016: Hitzesommer	
	Willkommen auf drought.ch – die Informationsplattform zur Früherkennung von Tockenheit in der Schweiz Die Plattform ist ein Forschungsprojekt des Nationalen Forschungsprogramms 61 und wird in Zusammenarbeit mit dem BAFU und der MeteoSchweiz durch die WSL betrieben. drought.ch liefert Informationen zu aktueller und bevorstehender Trockenheit, resp. Wasserressourcendefizit - es handelt sich dabei nicht um offizielle Warnungen. Mite wählen Sie aus: Aktuelle Situation	

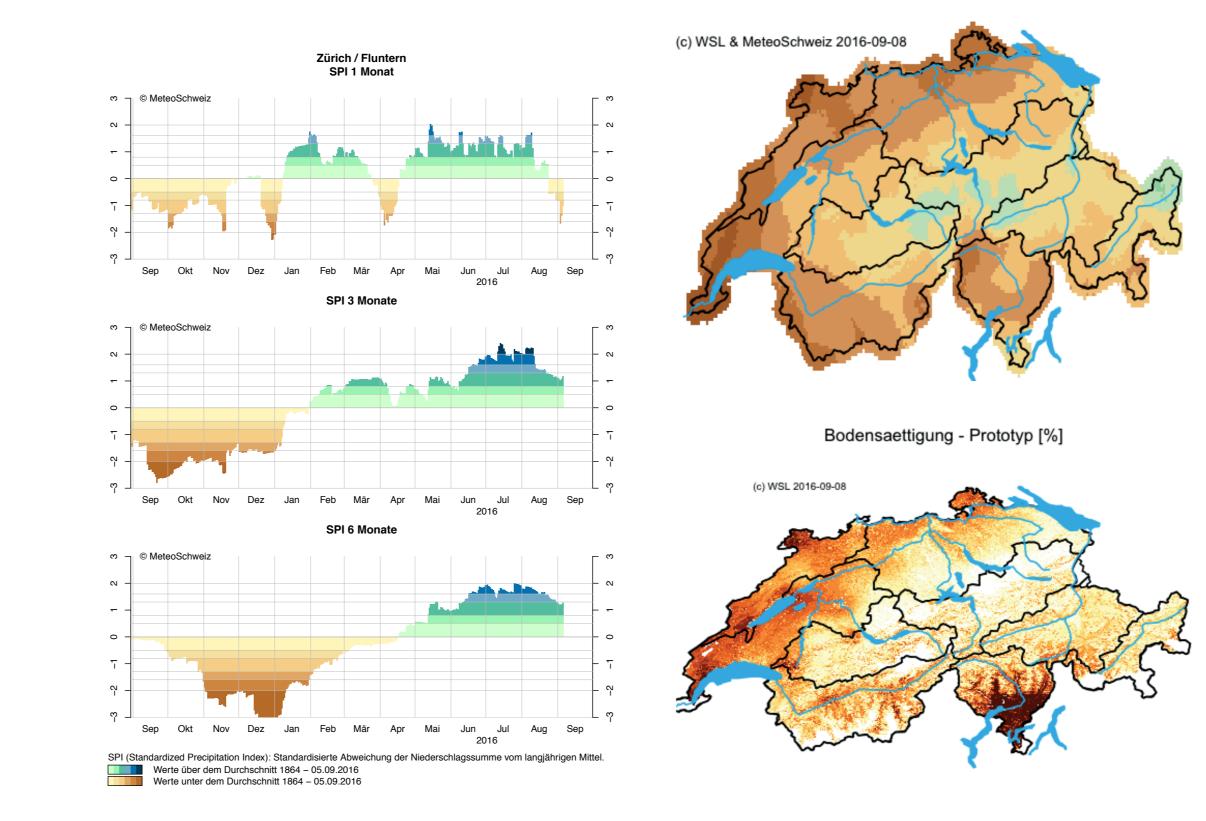
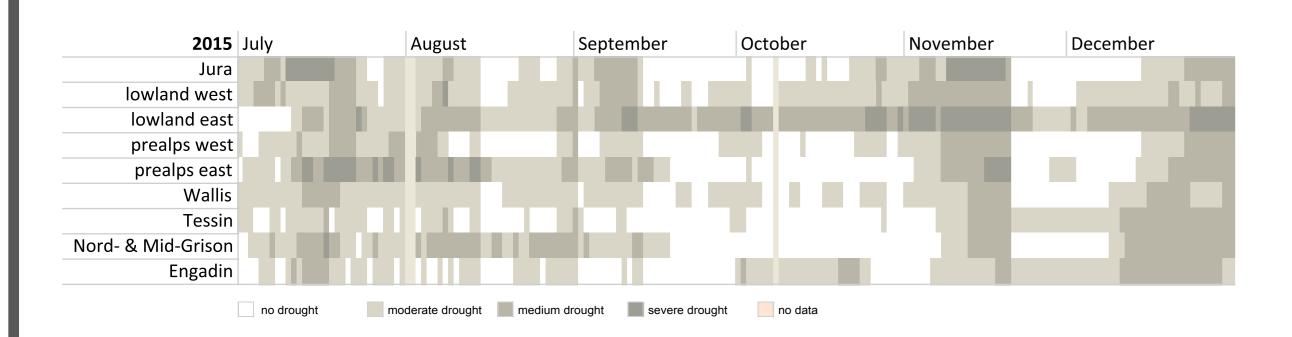


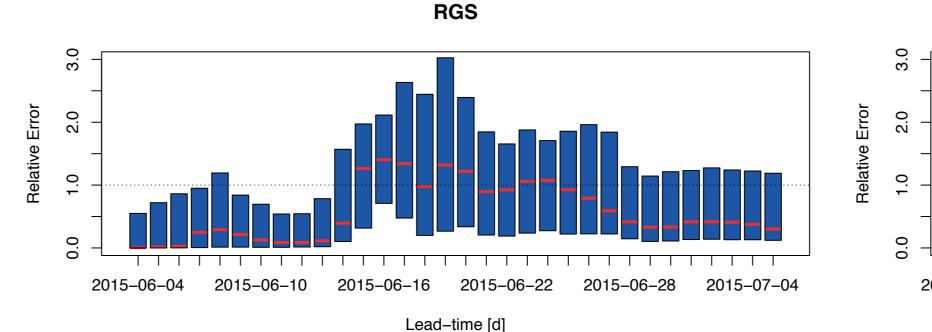
Figure 1

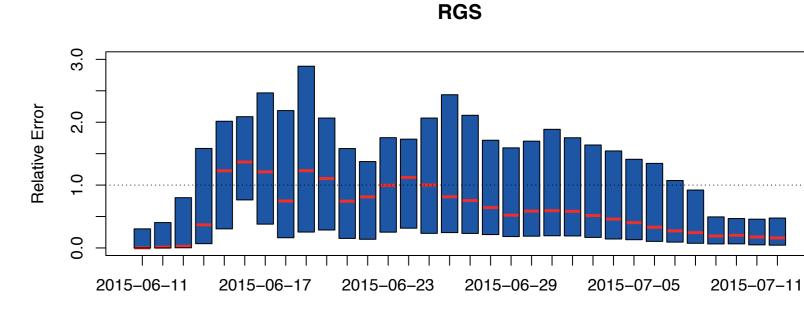
Left: Cartographic representation of the acutal dry

- situation. In addition, the situation is moderated daily in order to simplify the interpretation of the typed cards
- Center: Visualization of the Standardized
- Precipitation Index for accumulated series of one month (top panel), three months (middle panel) and six months (bottom panel). The situation
- depicted refers to the MeteoSwiss Location "Zürich Fluntern" and for the period going from 1 September 2015 to 5 September 2016
- *Right:* Operational monitoring of drought indicators.
- The values shown indicate the area of the
- accumulated precipitation (20 days) compared to
- ^{0.5} ^b/₂ the past (1961 2010). Values <50% indicate
- relatively dry conditions, values >50% to more wet
- conditions. The more intense the color, the 0.1
- exceptional the event is (top). The bottom map correspond to the simulated soil saturation (FCP) on 8 September 2016

Analyses of the summer heatwave 2015







RGS



Lead-time [d]

RGS

0 2015-06-18 2015-06-30 2015-07-18 2015-06-24 -06 Lead-time [d] Lead-time [d] RGS RGS 0 2015-08-01 Lead-time [d] Lead-time [d]

Figure 2: Overview of the distribution of the automatically generated drought levels in the nine regions for the second half of the year 2015

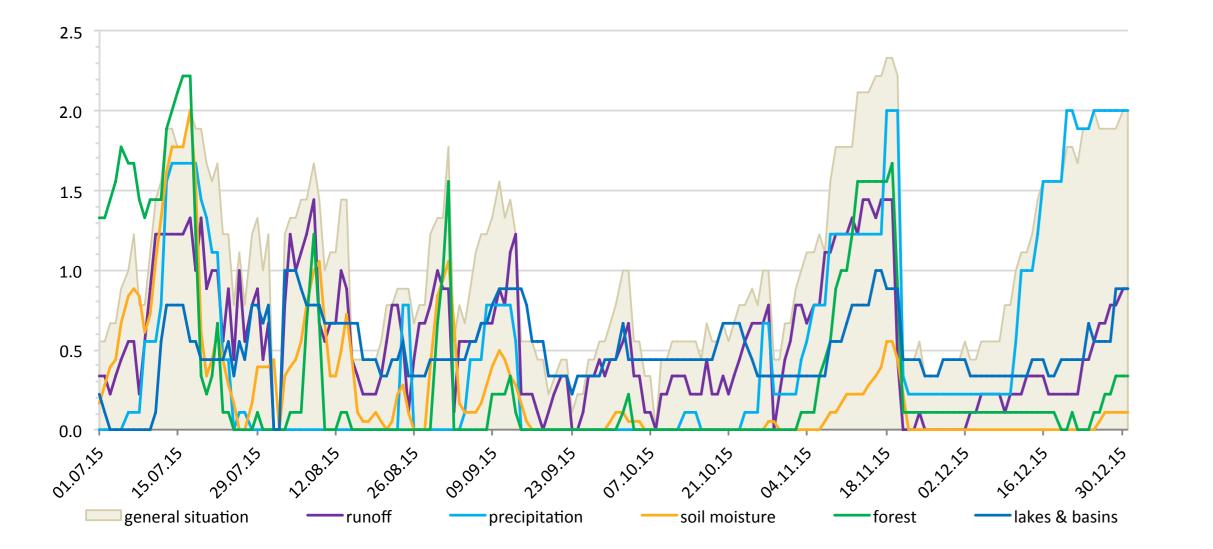


Figure 3: Averaged drought across all regions of the general situation and the characteristic quantities for runoff, precipitation, soil moisture, forest and lakes *Figure 5:* Geometric Mean Relative Absolute Error (GMRAE) will be applied to test accuracy of the Ensemble

mean in comparison to the climatology. The later the 30-day ECMWF-forecasts begin, the smaller the error for the runoff (RGS)

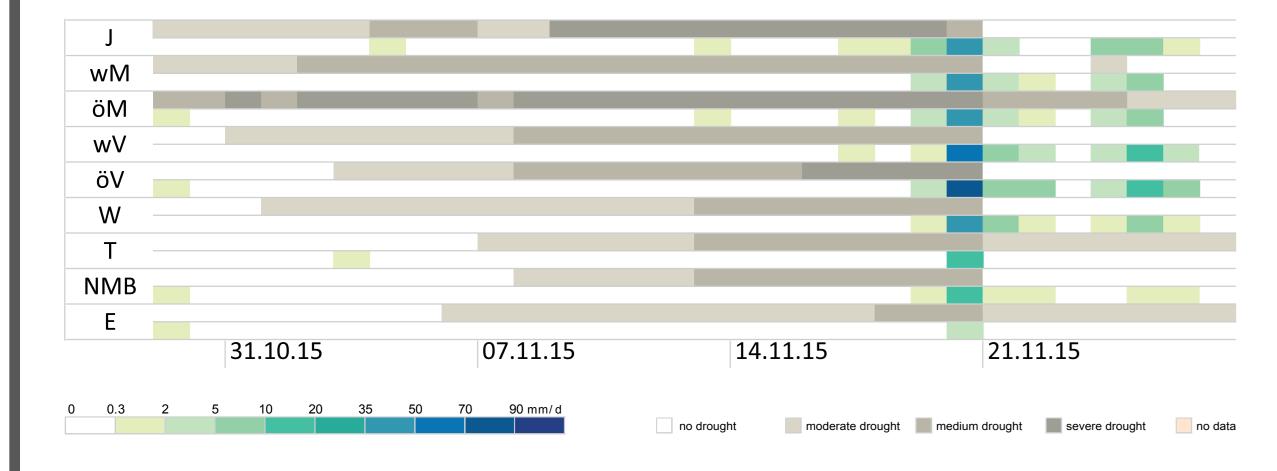


Figure 4: Comparison of the automatically generated drought levels of all regions with the average daily rainfall totals of selected stations

Conclusions

The drought.ch platform presents an example of an integrated customer-oriented product that has developed in a participative, yet science-driven process over the duration of three years. It illustrates a succesful way to create added value by integrating and tailoring available hydro-meteorological information from different sources to a specific purpuse, such as drought management.

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