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Federal Department of the Environment,  
Transport, Energy and Communications DETEC

**Federal Office for the Environment FOEN**  
Hydrology Division

# Heat and drought in Summer 2015

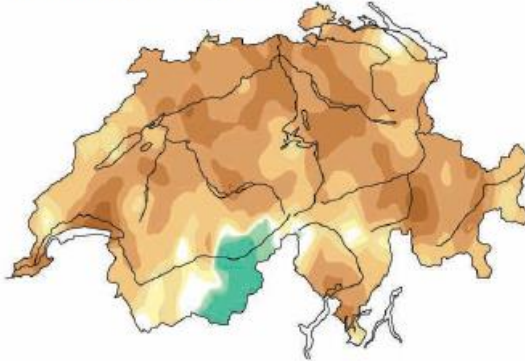


Olivier Overney, Federal Office for the Environment FOEN  
KHR symposium, 20.09.2017

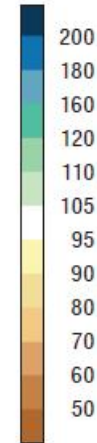
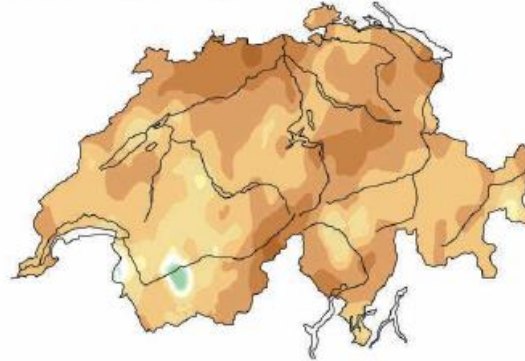


# Meteorologic situation (precipitation)

Abweichung zur Norm (%) (Ref. 1981–2010)  
Niederschlag Juni–August 2015



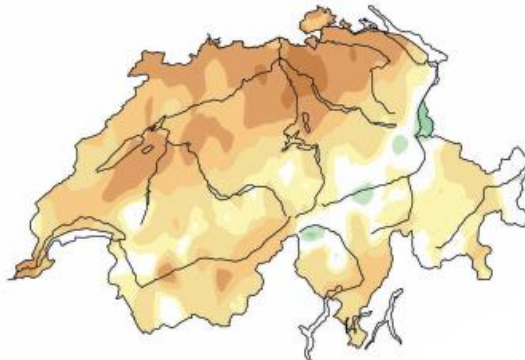
Niederschlag Juni–August 2003



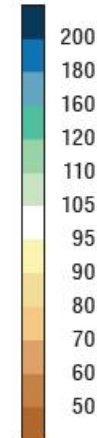
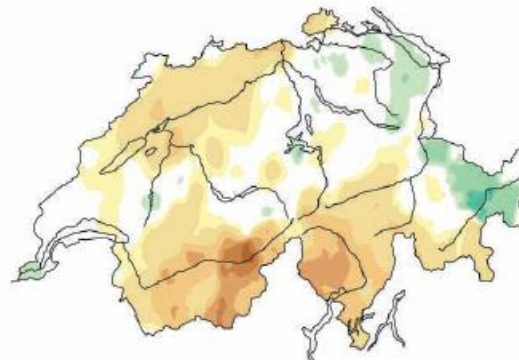
Summer

Quelle: MeteoSchweiz

Abweichung zur Norm (%) (Ref. 1981–2010)  
Niederschlag September–November 2015



Niederschlag September–November 2003



Autumn

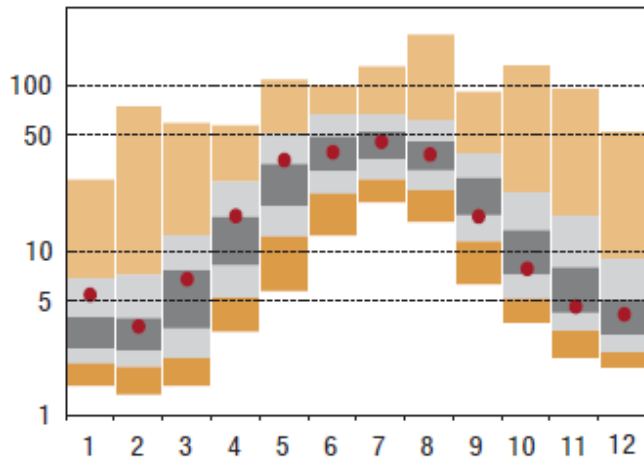
Quelle: MeteoSchweiz

Deviation in % of the quarterly precipitation of 2015 (left) and 2003 (right) from the reference 1981-2010.



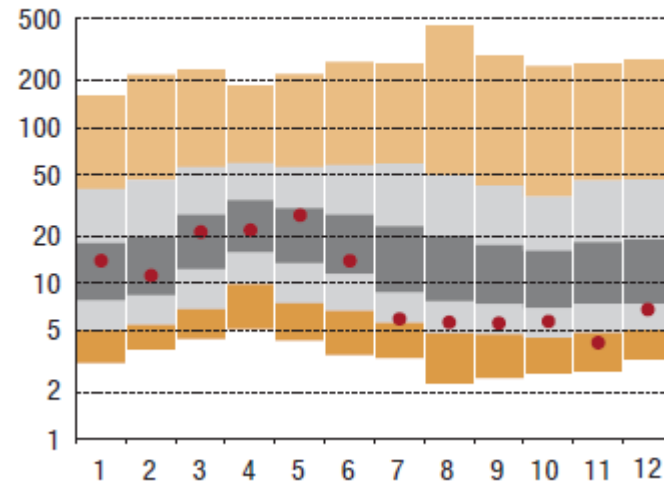
# Hydrologic situation (1)

c) Lütshine – Gsteig (1924–2015)  
Vergletscherungsgrad 17,4 %  
(m<sup>3</sup>/s)



Mountain torrent with an important surface of glaciers

d) Emme – Wiler (1922–2015)  
(m<sup>3</sup>/s)



River without any glacier

## Monthly distribution of average daily flow:

**Red dots** : median of daily flows per month in 2015

Dark grey : domain in which 50% of daily flows lie

Light- und dark grey : domain in which 90% of daily flows lie

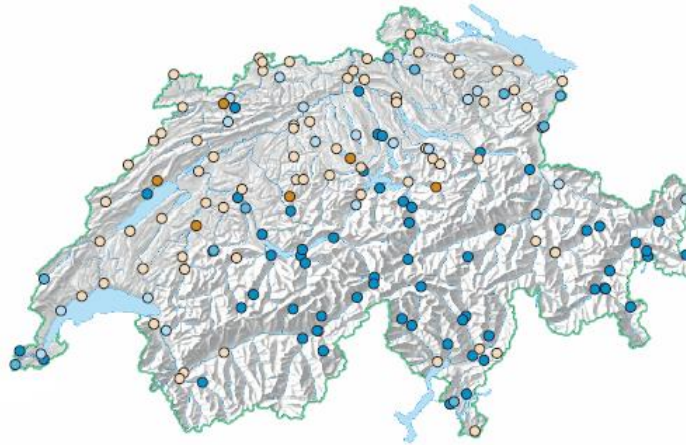
Light orange : domain with the highest 5% of daily flows

Orange: domain with the lowest 5% of daily flows

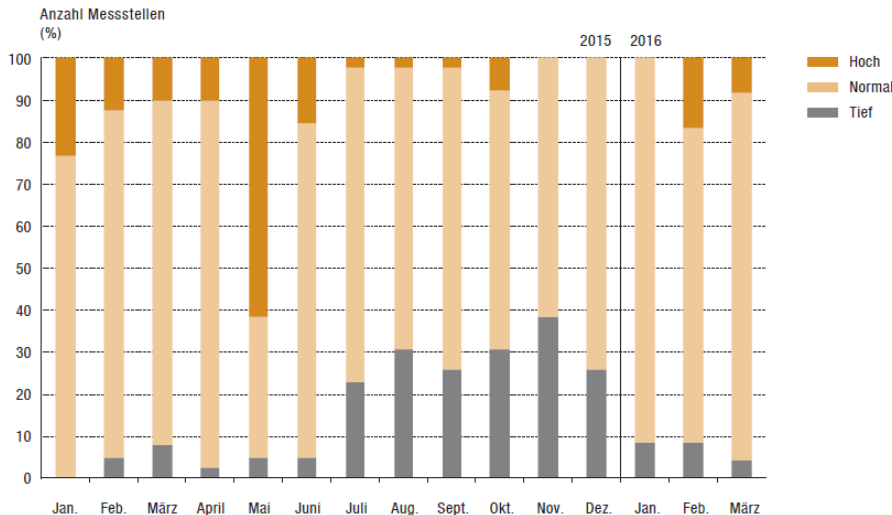


# Hydrologic situation (2)

Jährlichkeiten der Niedrigwasser-Kenngrösse NM7Q (2015)



**Watercourses: return period of low flow parameter NM7Q between 1<sup>st</sup> June und 31<sup>st</sup> December 2015.**



**Groundwater level and spring flow : number of stations with low, normal or high monthly value from January 2015 to March 2016.**

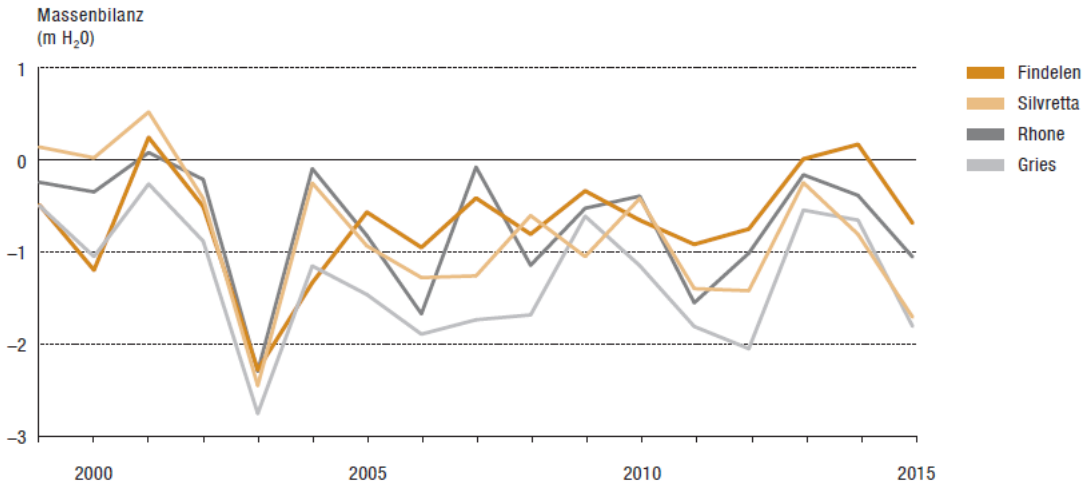
**Light orange:** 2015 values lie in the domain with 80% of the values between 1995 and 2014.

**Dark orange:** 2015 values lie in the domain with 10% of the highest values.

**Grey:** 2015 values lie in the domain with 10% of the lowest value.



# Glaciers



Quelle: GLAMOS

Annual mass balance for 4 glaciers from 1999 to 2015 in meter water equivalent.



Bild: Versuchsanstalt für Wasserwirtschaft, Hydrologie und Glaziologie VAW, ETH Zürich

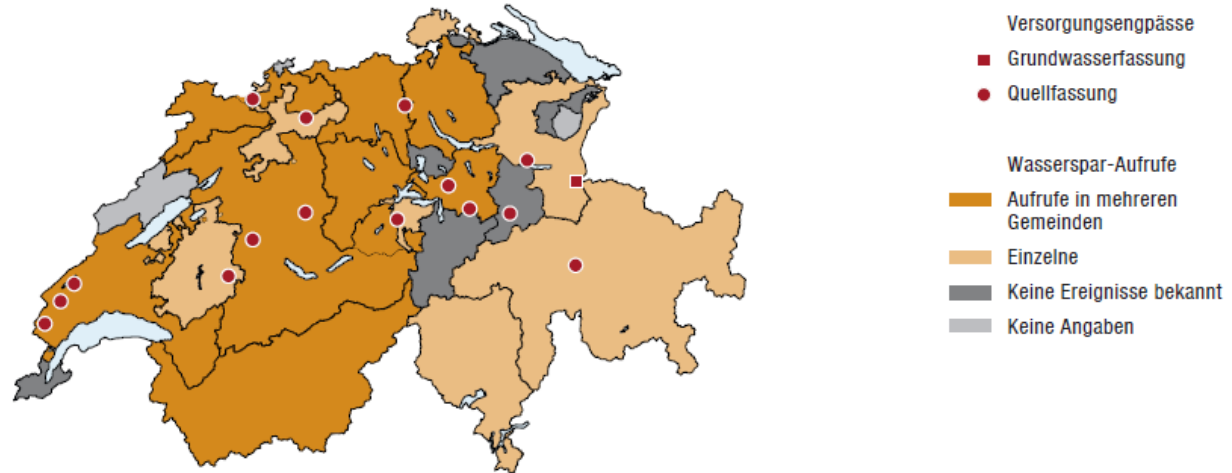
Glacier de la Plaine Morte: outbreak of glacier lake end of July 2015





# Water management

2. Halbjahr 2015



## Restrictions due to water shortage in the public and private water supply

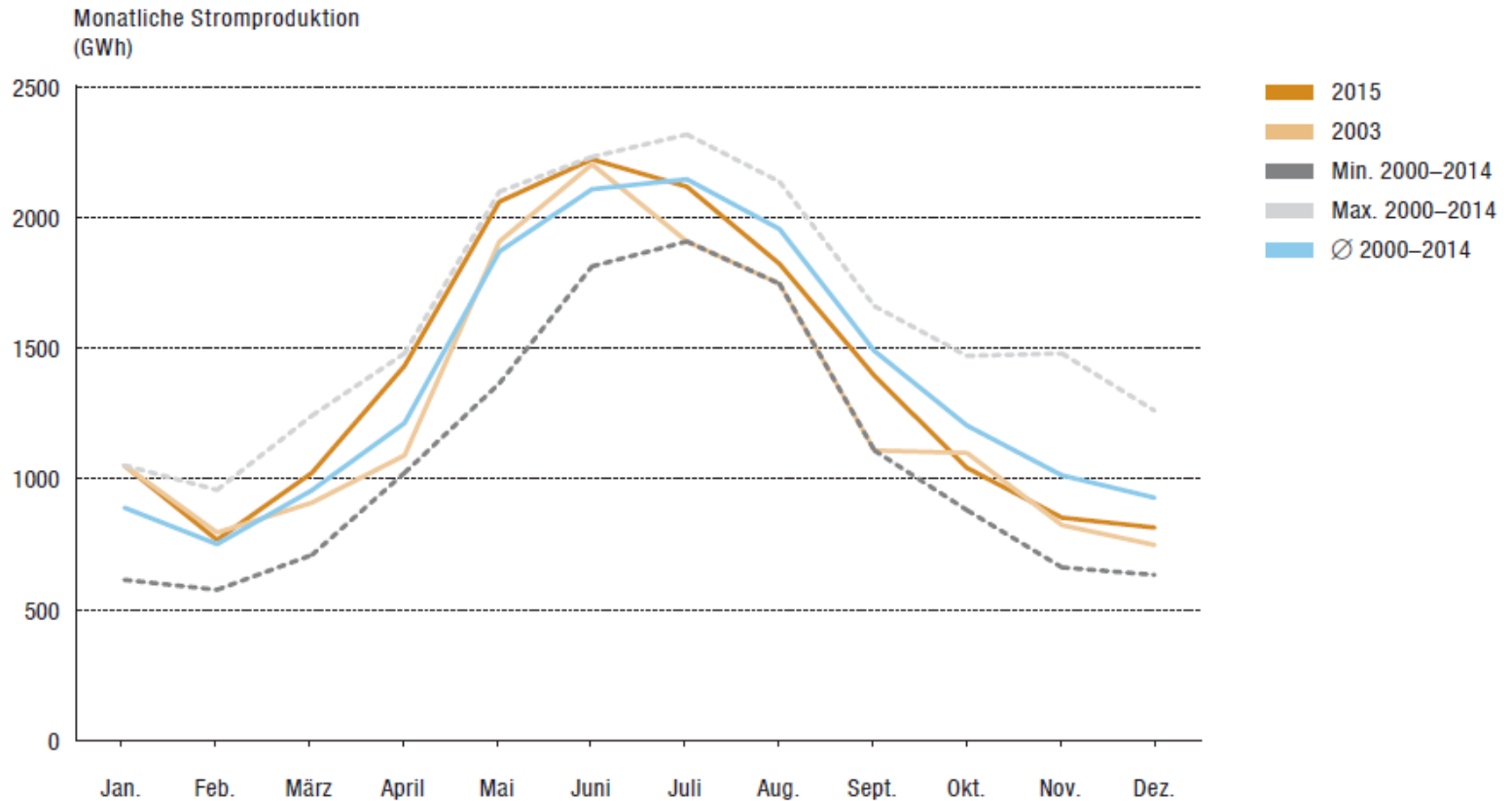
Anzahl Tage mit Unterschreitung des Q<sub>347</sub>  
(2015)



## Number of days in 2015 with river flow below Q<sub>347</sub> at FOEN-station



# Hydropower production



Quelle: Elektrizitätsstatistik der Jahre 2000 bis 2015, Gesamte Erzeugung und Abgabe elektrischer Energie in der Schweiz

Monthly power production from run-of-the-river power plant in the years 2015 and 2003



# Conclusions and consequences

Additional measures are needed if warm and dry summers become the standard:

- Swiss Action plan for the adaptation to climate change
- Water supply 2025
- Additional measures for the management of heat periods
- Early detection of drought
- Progress in the short term management of dry periods
- Preventive measure for dealing with water resources (IWRM)
- Securing of drinking water supply
- Measures for dealing with water shortage in agriculture

## Further information:

«Hitze und Trockenheit im Sommer 2015»: [www.bafu.admin.ch/uz-1629-d](http://www.bafu.admin.ch/uz-1629-d)

«La canicule et la sécheresse de l'été 2015»: [www.bafu.admin.ch/uz-1629-f](http://www.bafu.admin.ch/uz-1629-f)





**Aare, Bern, September 2017**