





# Examples of measuring stations





# Measurement conditions

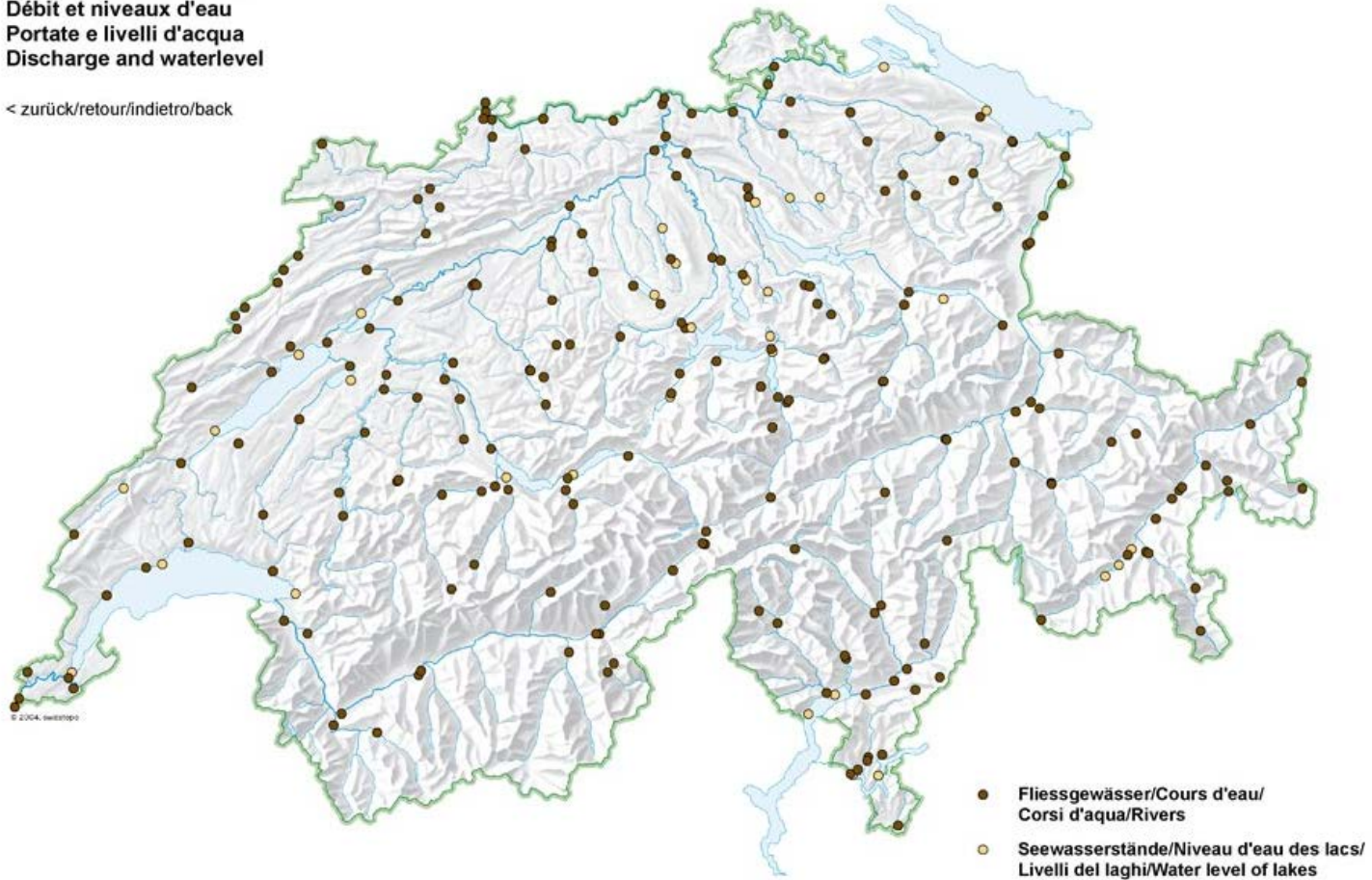




# National main networks: Water levels and discharge (247 stations)

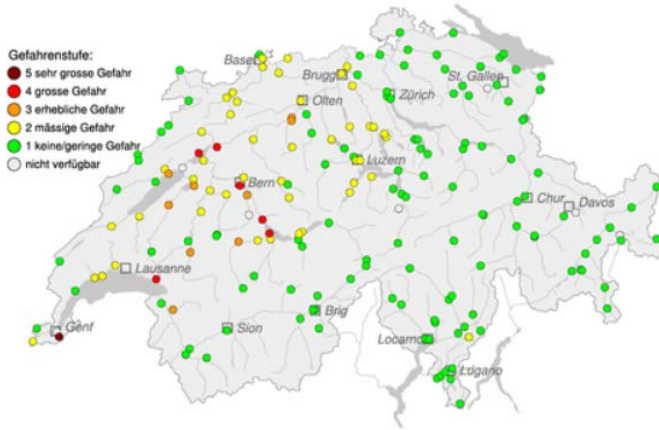
Abfluss und Wasserstände  
Débit et niveaux d'eau  
Portate e livelli d'acqua  
Discharge and waterlevel

< zurück/retour/indietro/back

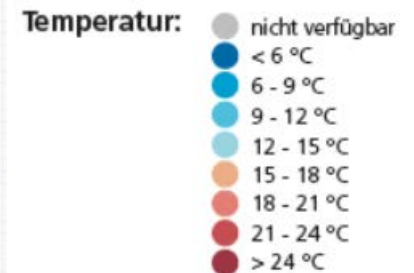
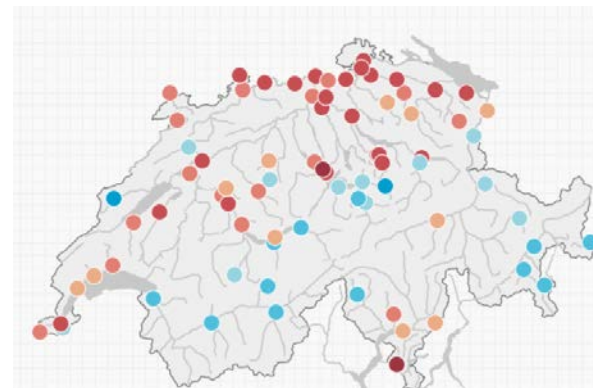




# Example: flood in May 2015



# and heat wave in summer 2015





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Confederazione Svizzera  
Confederaziun svizra

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Transport, Energy and Communications DETEC

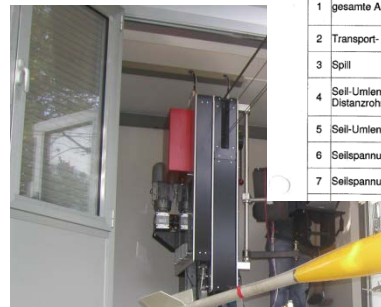
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# INSIGHTS - Infrastructure: station Töss-Neftenbach passage of fish





# INSIGHTS - Infrastructure: construction, maintenance, revision and inspection



Datum: 11.02.2014  
Visum: TW

**Inspektionsprotokoll der Anlage:**

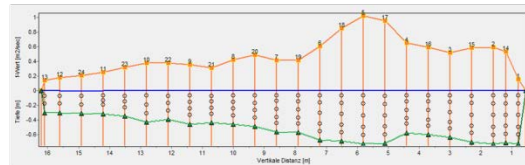
BAFU / MOSES

Aare - Bern

Nr.	Kontrollpunkt	Kriterium	Befund/Bemerkung	✓ Erfüllt / Problem-Nr
1	gesamte Anlage	Kontrolle auf lose Teile und sicherheitstechnisch einwandfreien Zustand		1
2	Transport- / Messeil	Gemäss Anweisungen des Seilherstellers (Register 8)		✓
3	Spill	Kontrolle auf Zustand (Verschleiss, Korrosion...)		✓
4	Seil-Umlenkringe Distanzrohre	Kontrolle auf satten Sitz der seitlichen Kunststoffführungen		4
5	Seil-Umlenkringe	Kontrolle auf Zustand (Verschleiss, Korrosion...)		✓
6	Seilspannung Tragsseil	22..26kN	24,5 kN	✓
7	Seilspannung Transportseil	1100...1300N	1150 N	✓

# INSIGHTS – measuring discharge

- Flow velocity measurements with hydrometric currentmeter



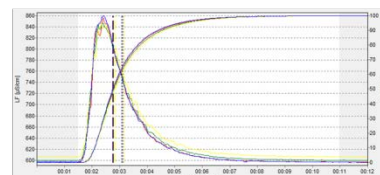
- ADCP (Acoustic Doppler Current Profiler)



- Tracer method (dilution gauging)
  - constant injection
  - slug injection



Fluorescent tracer measurement (uranin 10%)



Salt dilution measurement (conductivity)

- Surface flow velocity measurements
  - by radar speed meter
  - by floating bodies

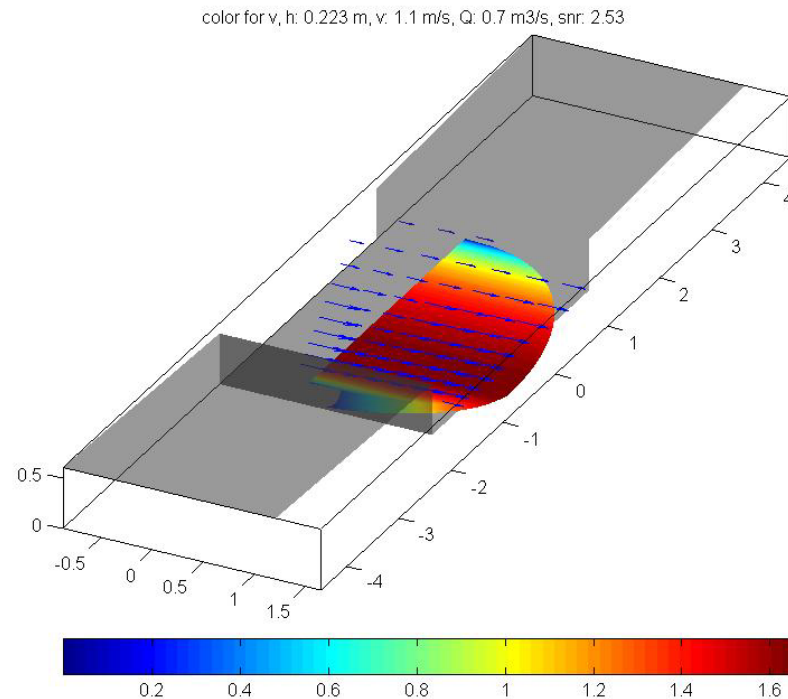
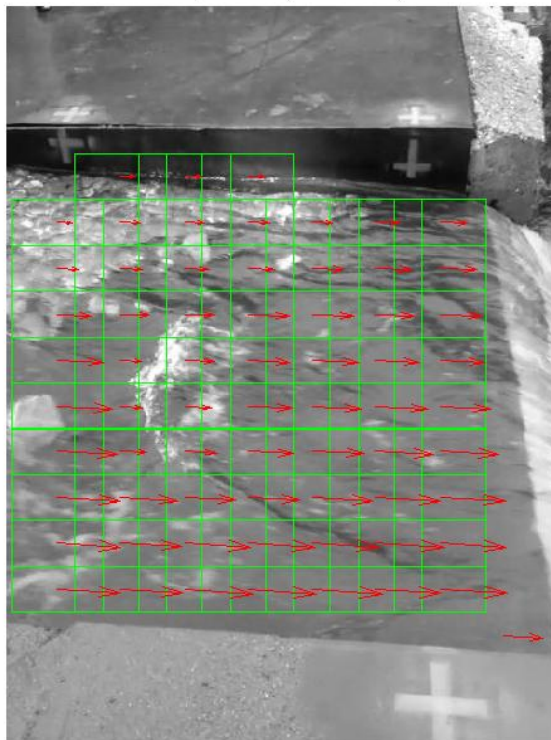






# INSIGHTS - Methodology: image-based discharge determination

h: 0.223 m, v: 1.1 m/s, Q: 0.7 m<sup>3</sup>/s, snr: 2.53



More information:  
robert.lukes@bafu.admin.ch  
<http://www.photrack.ch/streamflow.html>



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# Standardisation of technical installations in measuring stations I





# Renewal of measuring stations

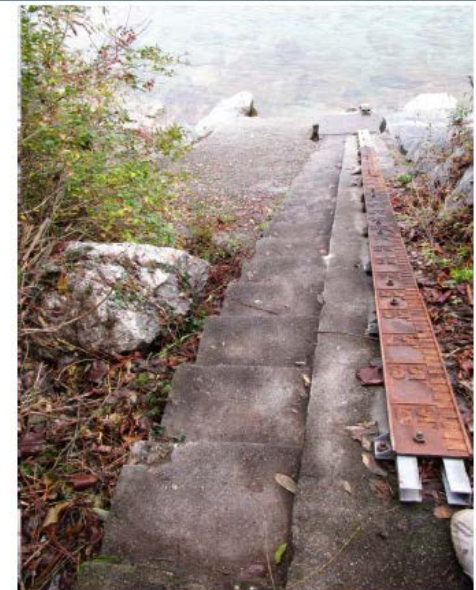


- Around 300 stations (target: until the end of 2017; current state on 1.9.2016: 31 renewed stations)
- Remote maintenance and monitoring
- Components meet industrial standards with increased requirements
- Standardized electrical cabinets with modular structure
- Redundant communication
- Autonomous power supply for 48h





# Safety at work : hazards





# Safety at work : object-based measures vs. personal protective equipment



Figura 16 Persona munita di imbracatura anticaduta su un dispositivo di tipo guidato.

Il dispositivo anticaduta di tipo guidato che scorre su una fune di sicurezza si aggancia all'elemento di attacco dell'imbracatura. Un cordino adeguato (secondo le indicazioni del fabbricante) facilita l'aggancio.

1 fune di sicurezza | 2 assorbitore di energia-imbracatura anticaduta | 3 dispositivo anticaduta di tipo guidato

