



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Federal Department of Defence, Civil Protection and Sport DDPS
Federal Office for Civil Protection FOCP

Radiological emergency evaluation and measures application in Switzerland

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National Emergency Operations Centre NEOC

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ASNR, Fontenay-aux-Roses (France), 30.04.2026





Agenda

- Introduction
- Radiological Hazard Assessment
 - Measurement vs Models
- Protective Measures
- Conclusion



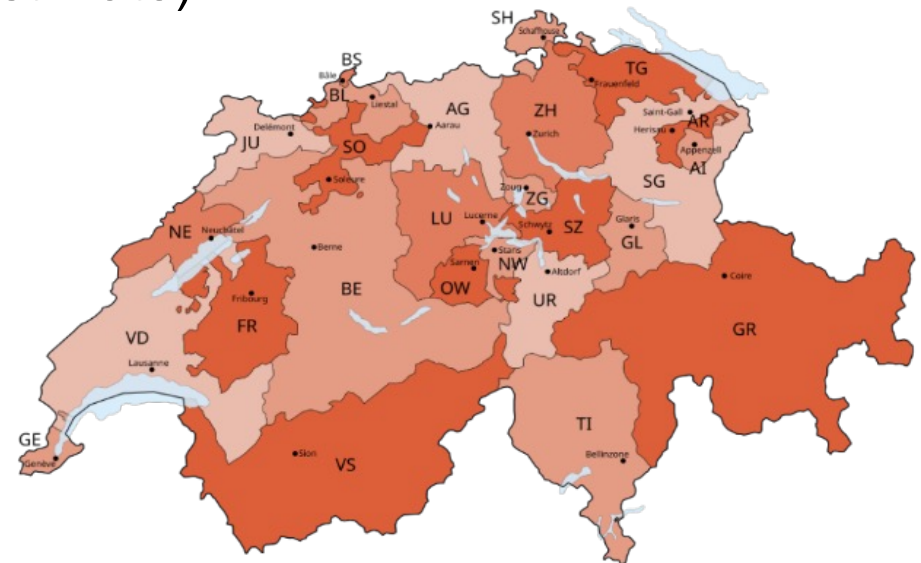
Introduction





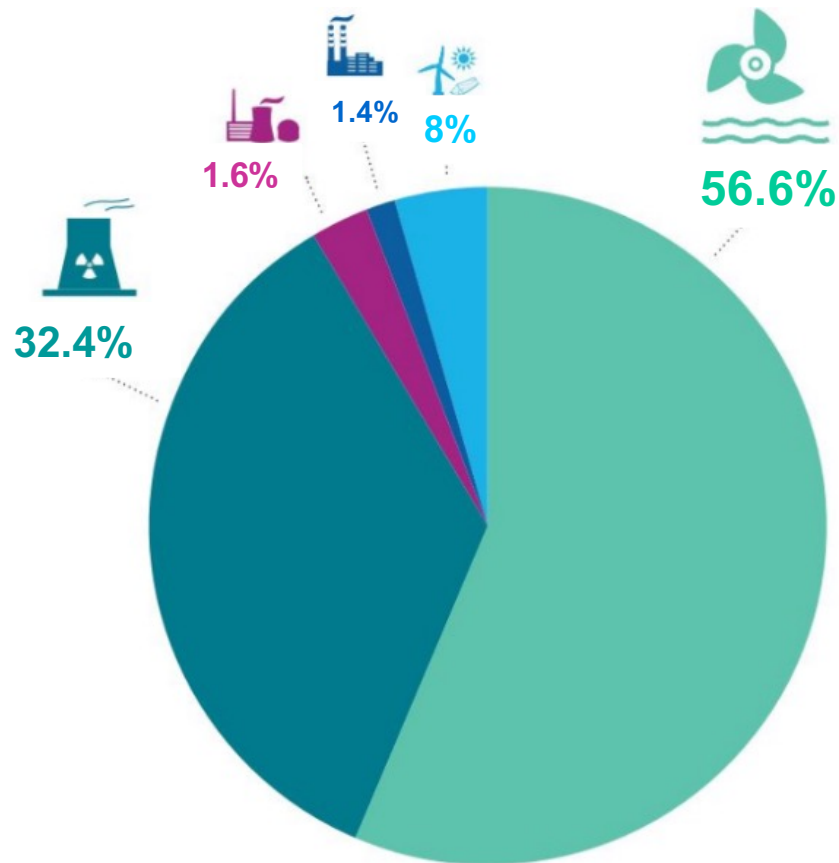
Switzerland

- 26 Cantons
- 3(4) Official languages (DEU, FRA, ITA and ROM)
- Population : 9'145'246 (April 2026 FSO estimate)
- Direct democracy and federalism
 - ⇒ Referendums
- 3 legal jurisdictions:
municipal, cantonal and federal





Switzerland: electricity production



Hydropower
(run-of-river power plants + storage power plants) **56.6%**
40.8 billion KWh



Nuclear Power 32.4%
23.3 billion KWh



Conventional thermal power plants and district heating plants (non-renewable) 1.6%
1.2 billion KWh



Conventional thermal power plants and district heating plants (renewable) 1.4%
1.1 billion KWh



Various renewable energies (wood, biogas, photovoltaics, wind energy) 8%
5.7 billion KWh

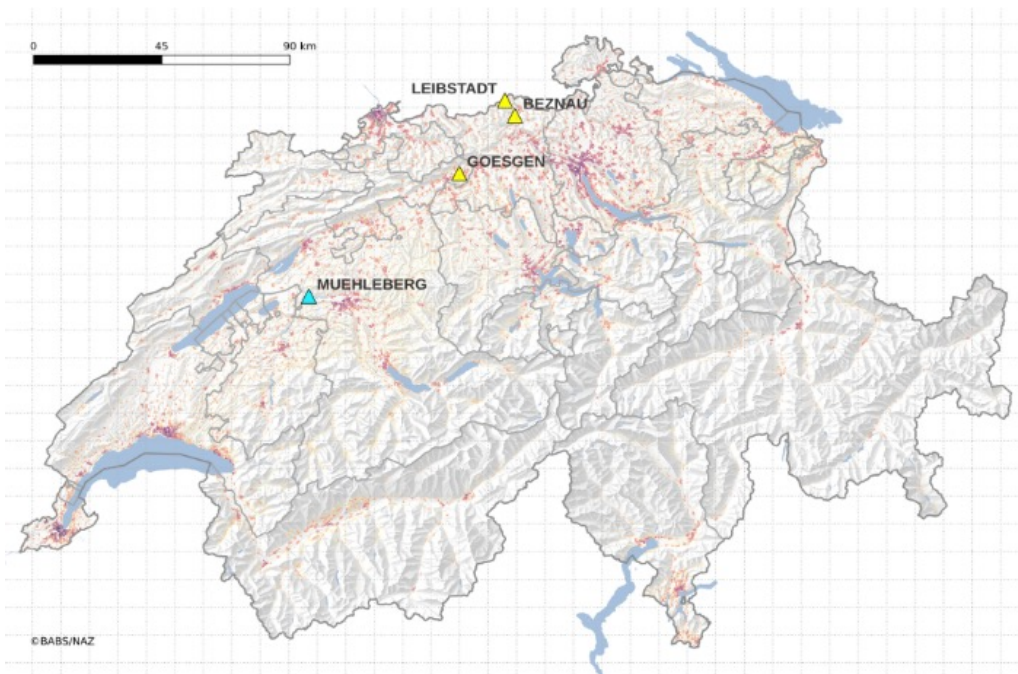
Total: 72.1 billion KWh

Source: Federal Office of Energy, 2024



Switzerland's Nuclear Power Plants

3(4) NPPs $\Rightarrow$ 4(5) reactors



- **NPP Leibstadt**
Boiling water reactor BWR/6
Start of commercial operations: 1984
Net electrical output: 1233 MWe
- **NPP Gösgen**
Pressurised water reactor
Start of commercial operations: 1979
Net electrical output: 1010 MWe
- **NPP Beznau**
Pressurised water reactors (x2)
Start of commercial operations: **1969/1972**
Net electrical output for each reactor: 365 MWe
- † **NPP Mühleberg**
Boiling water reactor
Start of commercial operations: 1972
End of commercial operations: 2019
Net electrical output: 355 MWe



Switzerland's Nuclear Power Plants



After the Fukushima nuclear accident, the Federal Council decided in 2011 that **the construction of new nuclear power plants is prohibited**

In May 2017, Swiss voters accepted the *new Energy Act* establishing the energy strategy 2050 and forbidding the construction of new nuclear power plants.

Existing Swiss nuclear power plants are allowed to operate as long as they are safe.

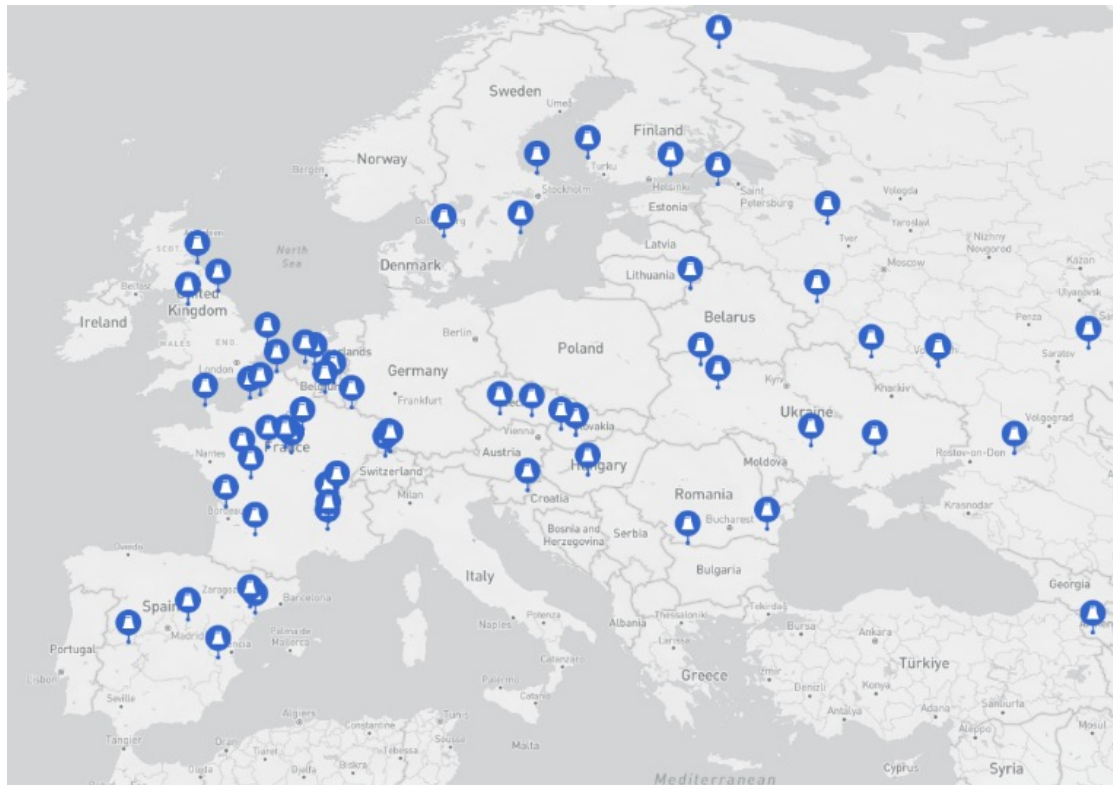
However, there is no ban on technology: nuclear research can continue!

Situation now:

- Discussion of removing this ban
- Construction of a new Research Reactor



Switzerland: Safety strategy



Source: IAEA IRMIS, April 2026

- Switzerland has NPPs
- Neighboring countries have NPPs
- A military conflict with nuclear threats is not too far from us

⇒ No change of safety strategy!!



Swiss authorities involved in radiological events

ENSI

Swiss Federal Nuclear Safety
Inspectorate

Oversees and monitors the operation of the
nuclear installations in Switzerland

NEOC

National Emergency Operations Centre

Division of the Federal Office for Civil Protection (FOCP), in charge of all emergency situations, including those arising from events at NPPs and relating to the protection of the public and the environment

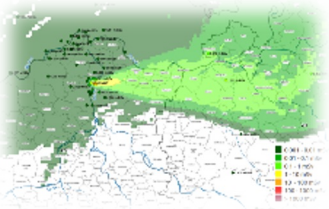
FOPH

Federal Office of Public Health

In charge of the radiological monitoring of the
environment.



NEOC Duties Related to Increased Radioactivity



NEOC duties for incidents with increased radioactivity involved

- **Determination of the Radiological Situation**
- **Radiological Hazard Assessment** for population and environment
- **Deployment of the sampling and measurement organization**
- **Provision of Early Warnings** to authorities
- **Public Alerts**
- **Order of Protective Measures**



Radiological Hazard Assessment

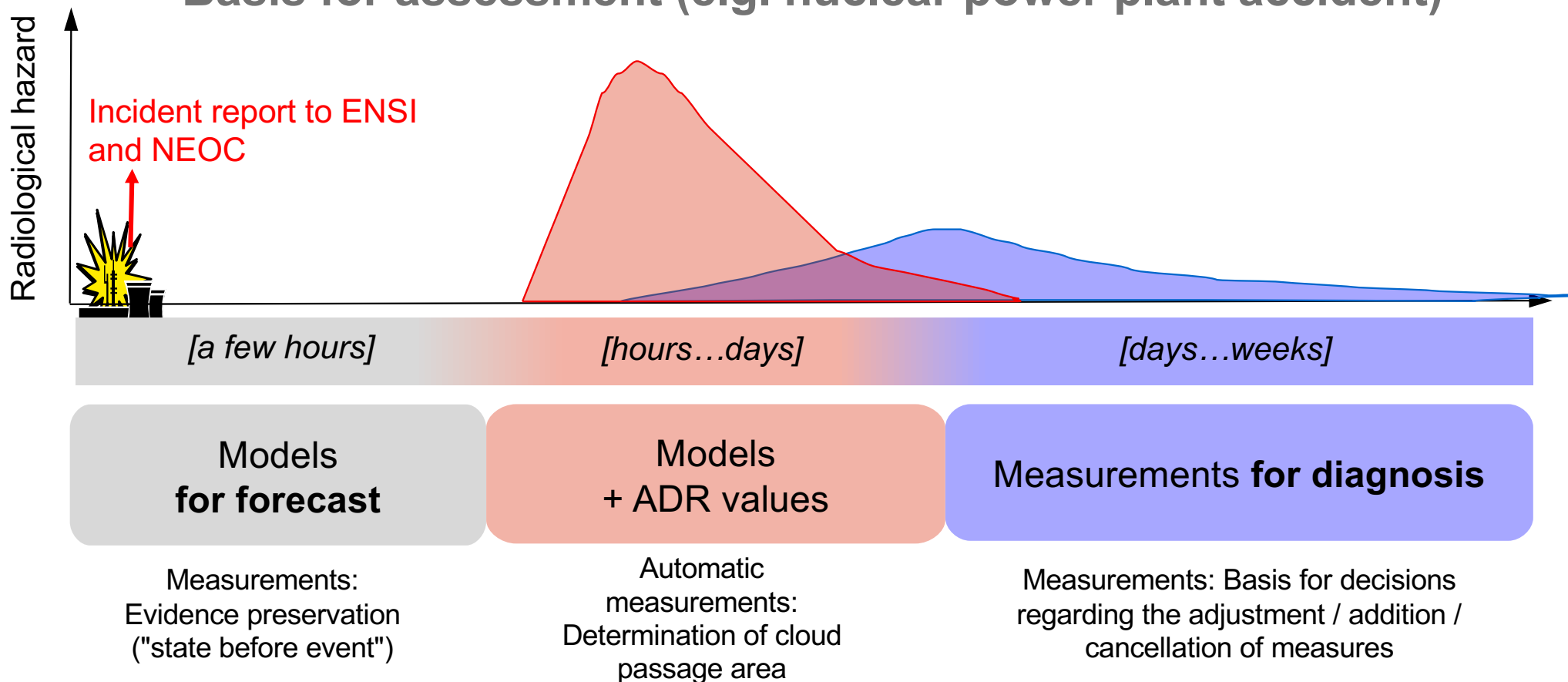
NEOC Duties





Determination of the radiological situation

Basis for assessment (e.g. nuclear power plant accident)



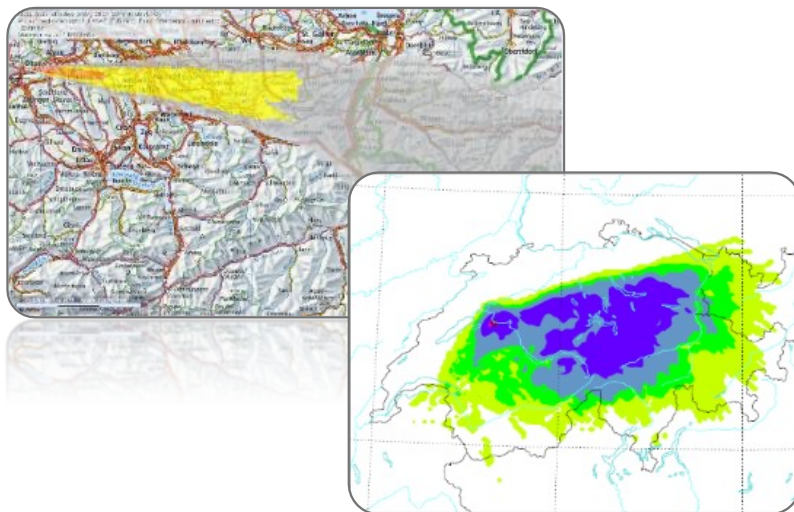


Radiological assessment of the situation

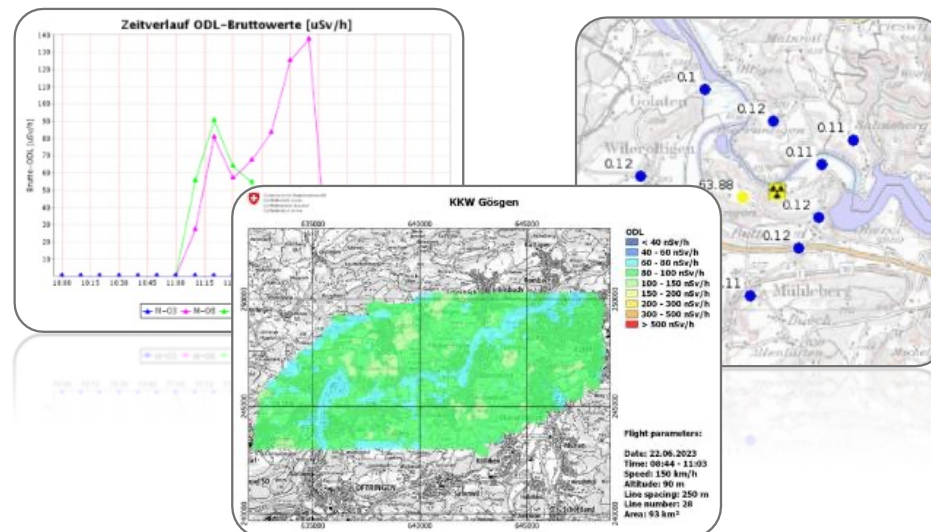
Prognosis vs. Diagnosis

On what basis is an assessment of the radiological risk made?

Models for forecast



Measurements for diagnosis





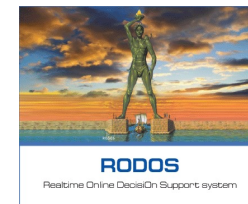
Models for forecast

In Switzerland, in case of nuclear incident, 3 government entities are involved in forecasting the radiological consequences:

- ENSI
- NEOC
- MCH (MeteoSwiss)

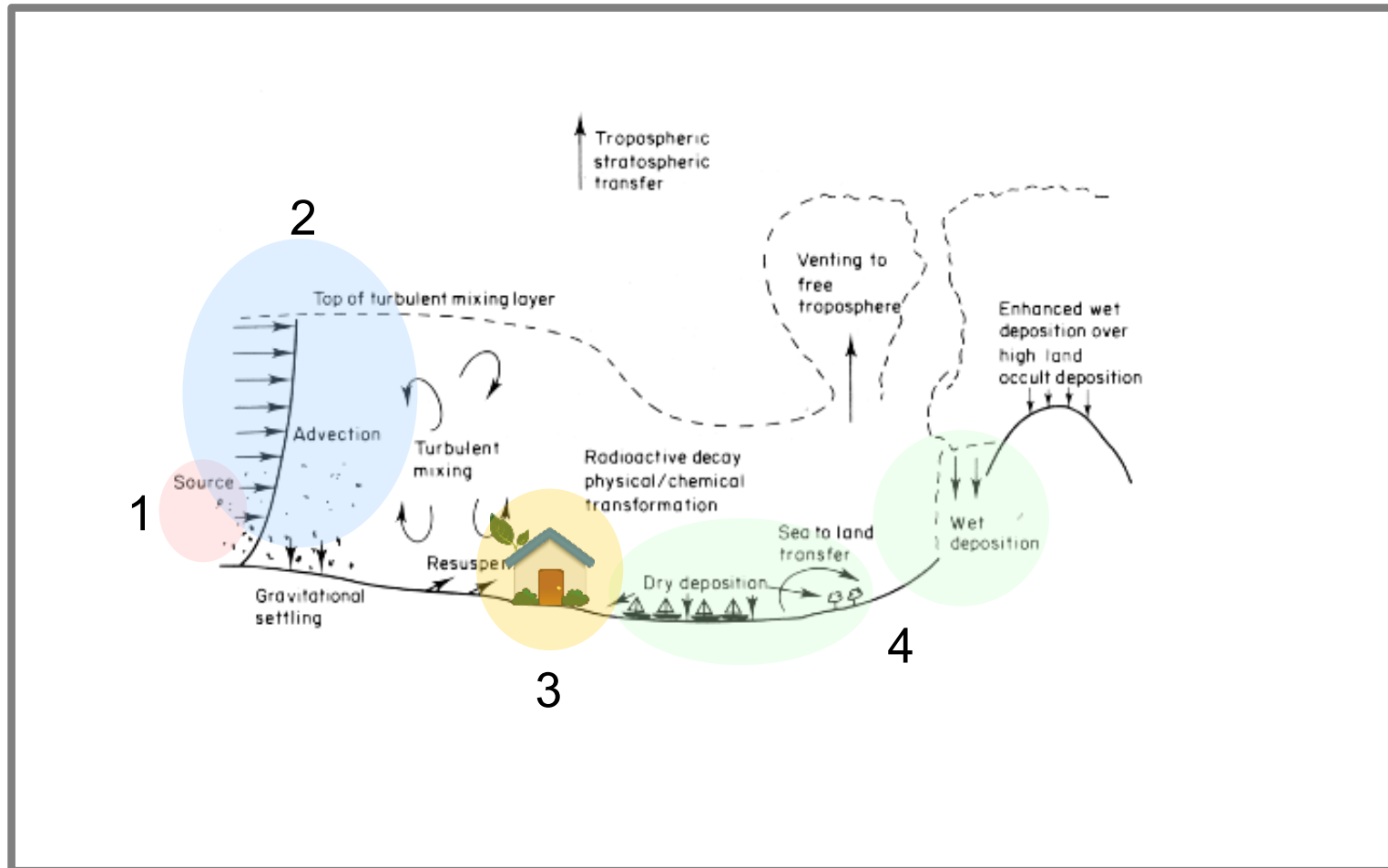
Tools being used

- Trajectories (LAGRANTO)
- Dispersion model(FLEXPART)
- Decision support systems (LASAT + JRODOS)



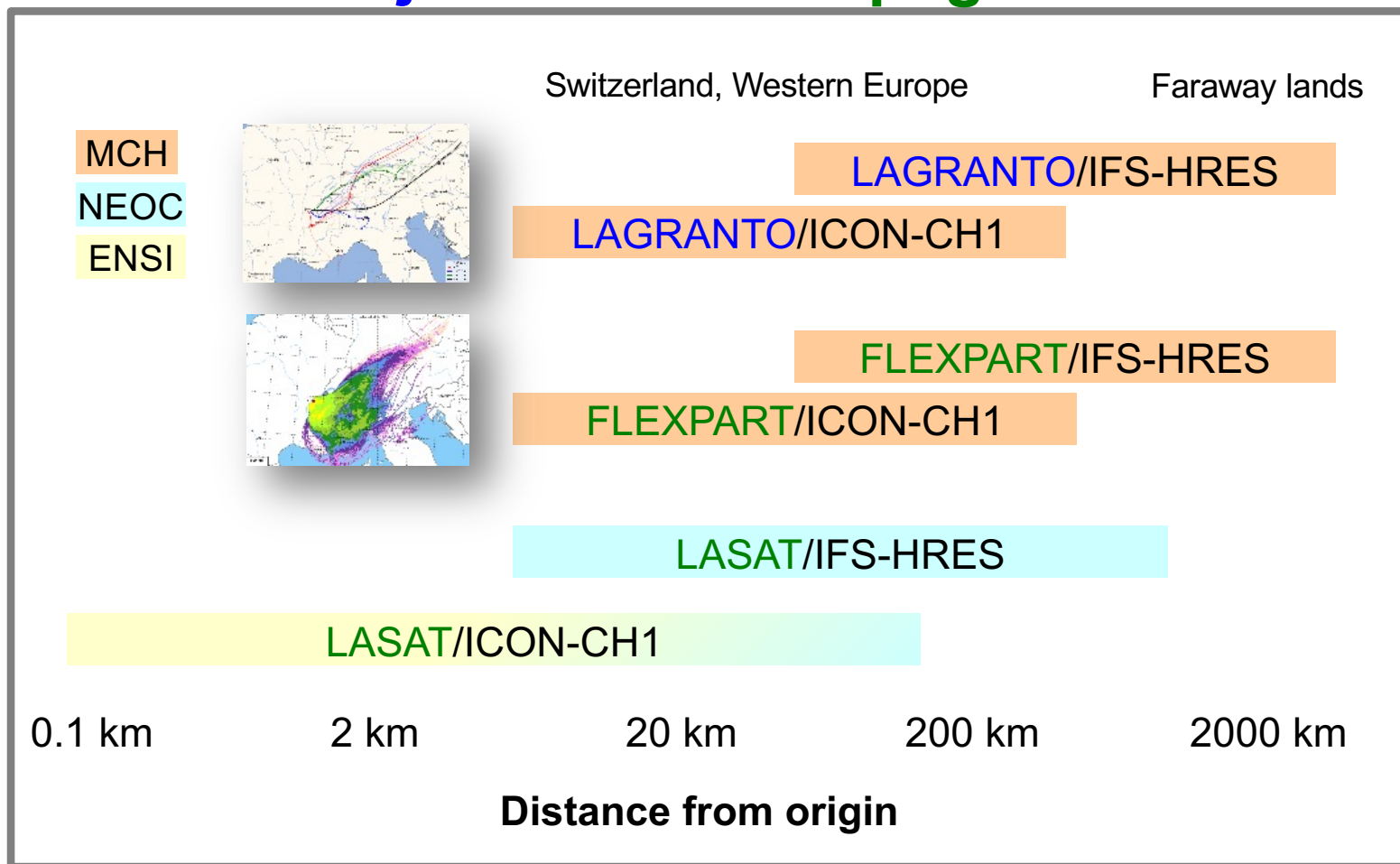


Dispersion models



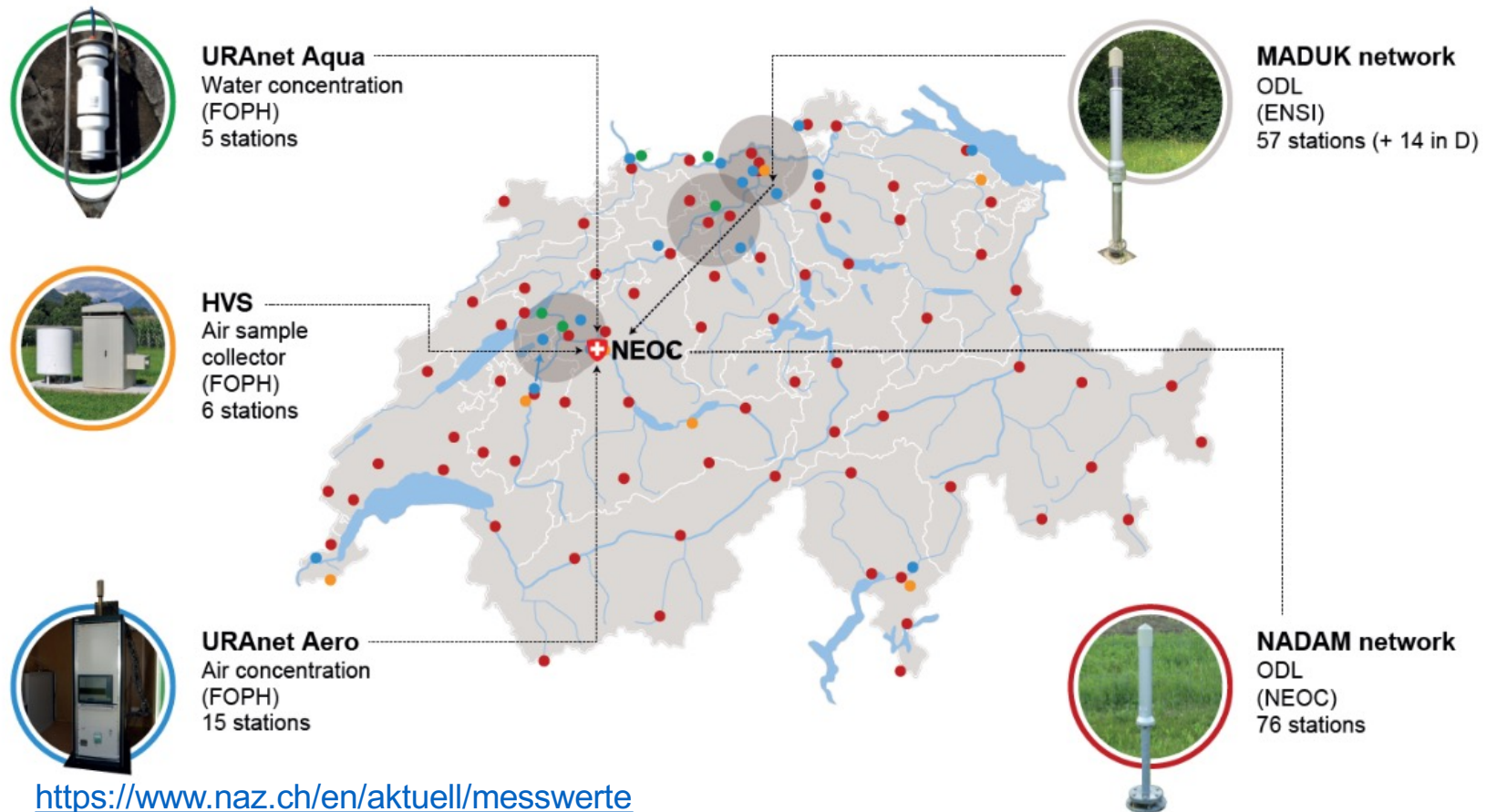


Models : Trajectories + Propagation





Sampling and measurement organisation



<https://www.naz.ch/en/aktuell/messwerte>

<https://www.radenviro.ch/>

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Sampling and measurement organisation



NADAM-Mobil
Local dose rate
(NEOC)
30 mobile probes



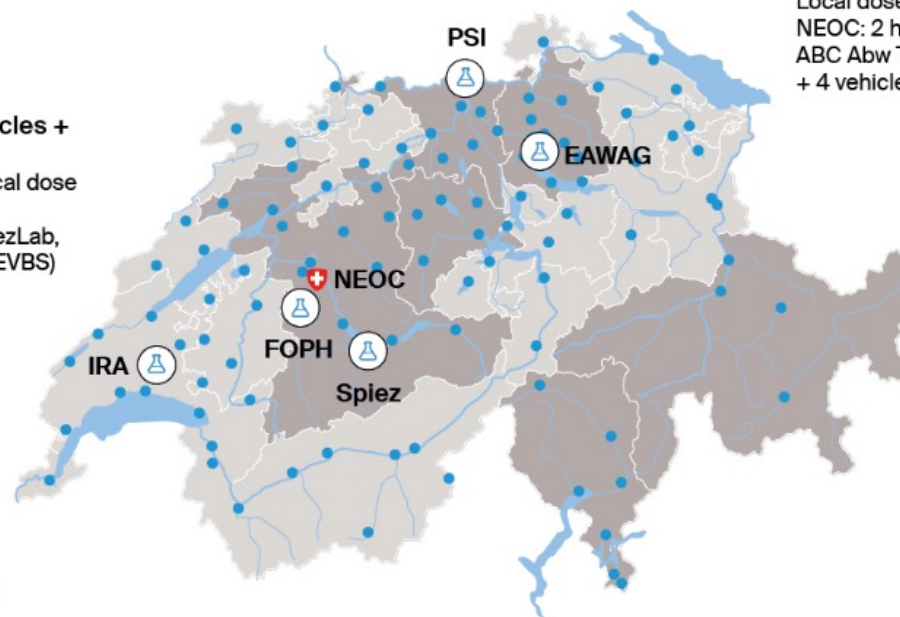
Measurement vehicles + A-EEVBS (MesWa)
Sample collection, local dose rate, contamination, in-situ-y-spectro (SpiezLab, NPPs + ZWILAG, A-EEVBS)
max. 12 units



- **Cantonal measurement support for NEOC (KAMU NAZ)**
Local dose rate (radiation protection service, cantonal fire brigade)
104 measuring points



SU emergency response team
Local dose rate, contamination, decontamination
(PSI: on permanent standby;
IRA, A-EEVBS: according to "best effort")
max. 3 units



Laboratories
Environmental sample measurements
FOPH, IRA, LS/ABC Abw Lab 1,
PSI (and EAWAG)



Cantonal laboratories
Measurements in foodstuff samples
AG, BE, BS, GR, LU, TI, ZH

Aeroradiometry

Local dose rate, deposition
NEOC: 2 helicopters (ARM)
ABC Abw Tr: 2 helicopters (ARM)
+ 4 vehicles (BoRa)



Mobile air sample collector (MobLuSa)

Aerosols, iodine (laboratories)
11 devices



Mobile Laboratory

Measurements in samples and individuals (A-EEVBS)
2 vehicles





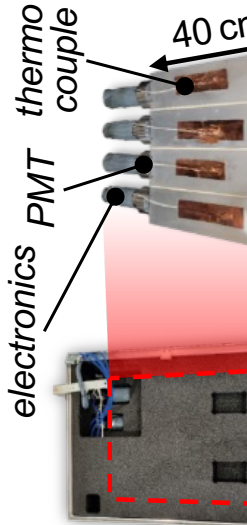
Airborne Radiometrics in Switzerland

Measuring System – Helicopter and Crew Characteristics

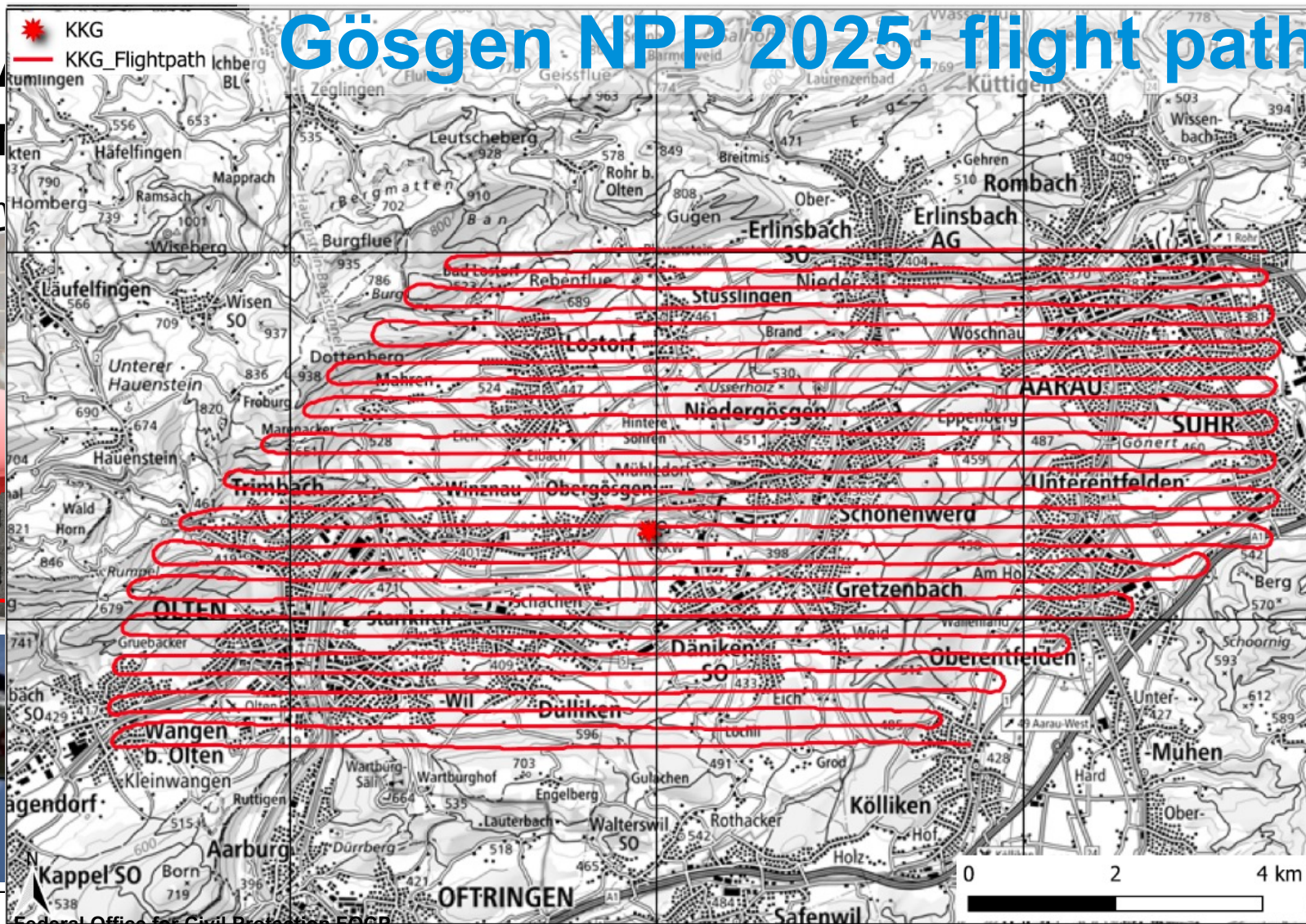


- **Eurocopter AS332M1 Super Puma**
(Swiss Air Force Transport Helicopter TH06)
- Flight endurance: 3 1/2 h (without extra fuel tanks)
- Payload (incl. crew): 4 000 kg
- Measuring system weight: 340 kg, detector mounted in cargo bay
- **Air force crew:** PIC, co-pilot, loadmaster
- **NEOC crew:** 2 ARM operators (military
NEOC support staff)
- Communication:
 - intercom (headset)
 - shared screen





Gösgen NPP 2025: flight path and



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Protective Measures

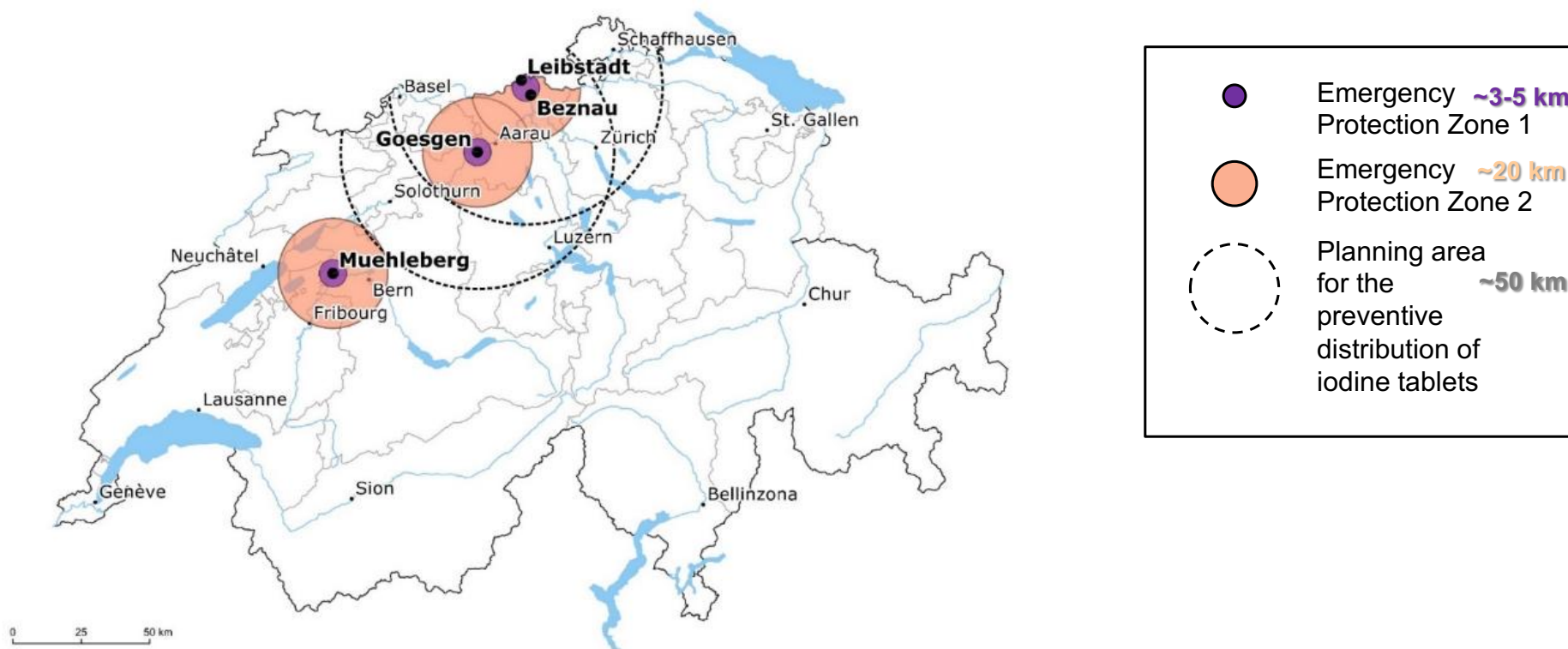
NEOC Duties





Emergency protection concept

Protection zones and planning zones





Immediate measures in the acute phase

CMD: immediate measures with dose thresholds

Measures ordered in case of
imminent danger to the population in
order to limit health risks

Immediate measures	Dose*	Dose threshold
Protected stay (house, cellar or shelter)	$E_{\text{ext}} + E_{\text{inh}}$	10 mSv
Preventive evacuation or protected stay	$E_{\text{ext}} + E_{\text{inh}}$	100 mSv
Taking iodine tablets	$H_{\text{Sch,inh,lod}}$	50 mSv

** The dose that can be expected in the event of exposure or incorporation within seven days of the event if the planned protective measure is not implemented.*

Ordered measures concerning agriculture

A ban on harvesting and grazing can be ordered as a preventative measure:

- areas for which measures have been taken
- areas located downwind



The National Emergency Operations Centre is ...

...the specialised federal government civil protection organisation.

