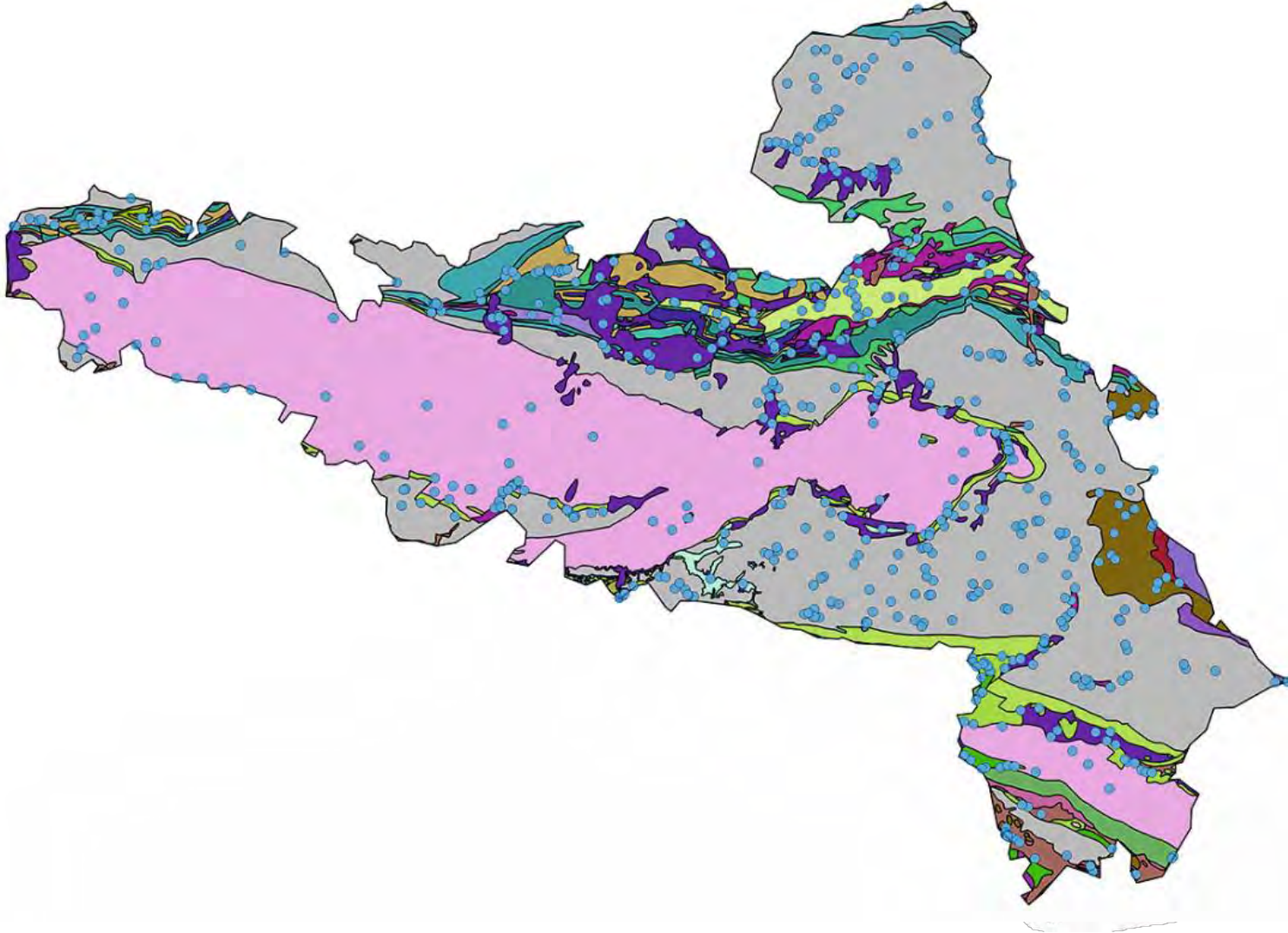


# Karst spring monitoring in Kalkalpen National Park



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# Geography, Geology and Springs



2 mountain ranges:  
Sengsengebirge  
Reichraminger  
Hintergebirge

Pink: limestone  
(Wettersteinkalk)  
Grey: dolomite  
(Hauptdolomit)

75% carst

Over 800 springs  
documented



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# Why monitor springs?

Springs are fingerprints of their water catchment area

Information on natural dynamic processes or pollution

Karst is highly vulnerable

Effects of climate change on local water cycles

Habitat of highly specialized species



1990-1995 mapping of springs on  
Nationalpark territory

Over 800 springs documented

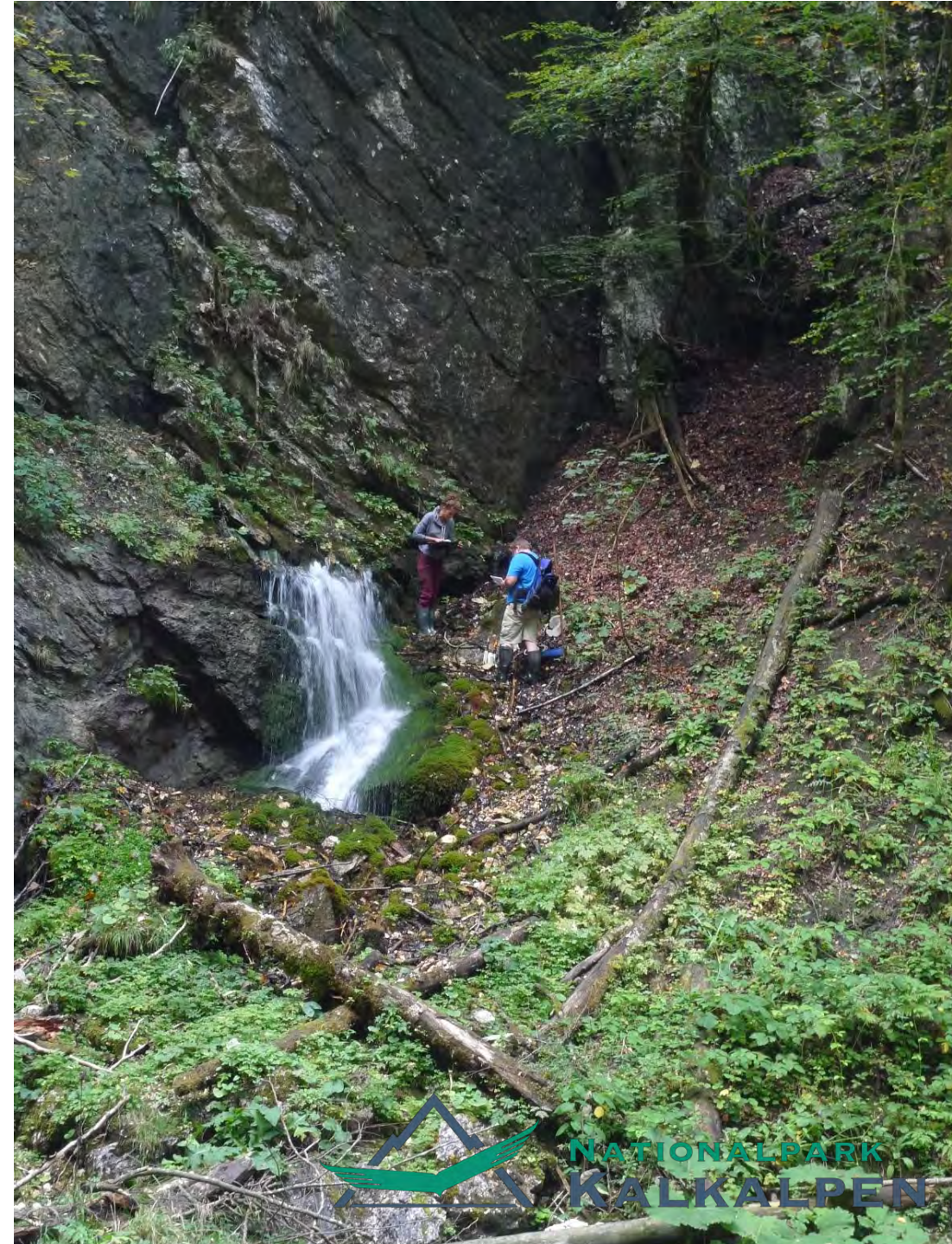
First spring monitoring in 1991

Today:

10 monitoring springs, monthly sampling

3 additional priority areas (each covering 5  
springs) → sampling in spring, summer,  
autumn

Collecting data on chemical, physical and  
microbiological parameters





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# Fieldwork



Collecting samples for microbiological analysis and chemical analysis





Electrical  
conductivity  
pH  
Oxygen saturation  
and content  
Water  
temperature

Spring discharge  
(estimate)

Air temperature  
and notes on  
weather  
conditions



# Laboratory analysis

Anions and cations:

Calcium

Magnesium

Chloride

Sulfate

Hydrocarbonate

Natrium

Potassium

Ammonium

Nitrate

Nitrite

Absorption coefficient

254nm

436nm

Turbidity



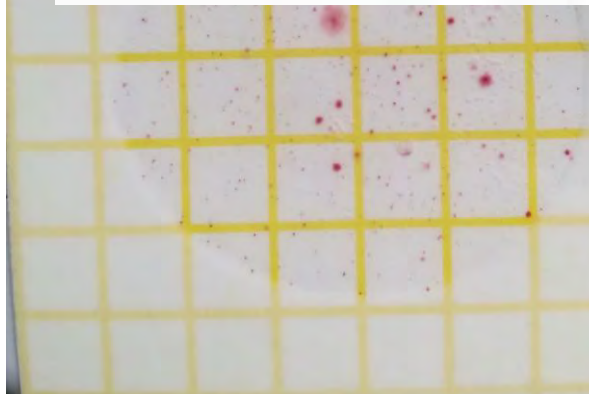
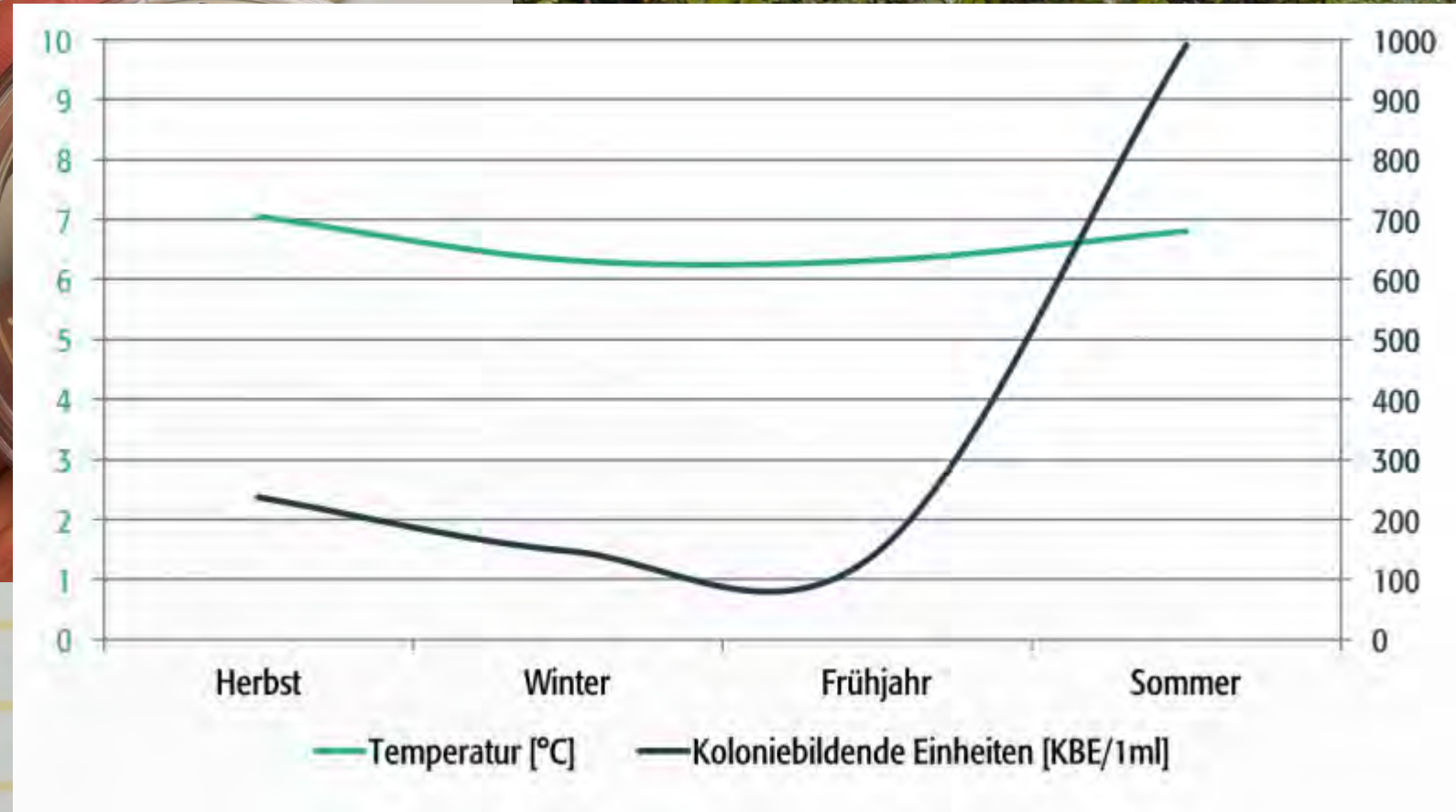
# Microbiological analysis

E-coli

Coliform bacteria

Enterococci

Total bacteria count



Cooperations  
with other  
national  
parks and  
conservation  
projects



# Rangers and Spring monitoring

Involving Rangers in field work

Doing fieldwork in teams for safety reasons – especially during winter

Integrating junior rangers during training

More people involved secures monitoring activities

Example: Spring monitoring  
Berchtesgaden National Park



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**Thank  
you!**



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