

NORWEGIAN CENTRE FOR CLIMATE SERVICES

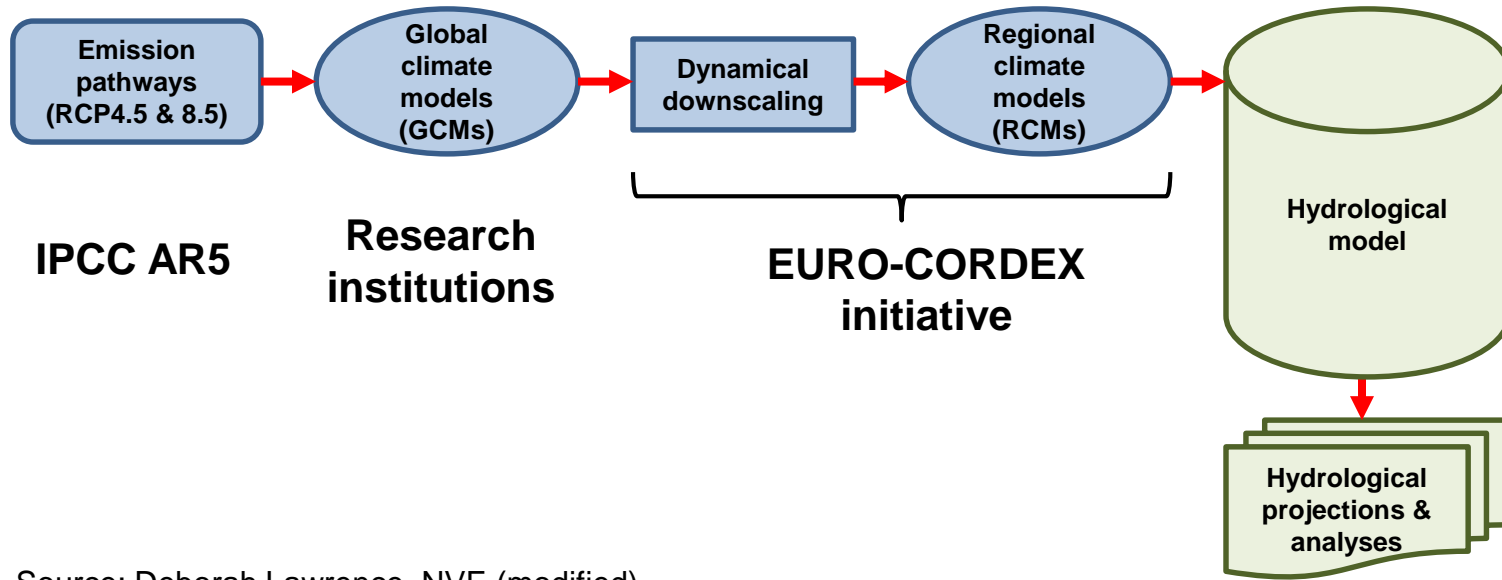


Gridded 1 x 1 km climate and hydrological projections for Norway

Wai Kwok Wong, Astri Tale Eirum, Hege Hisdal & Nils Kristian Orthe

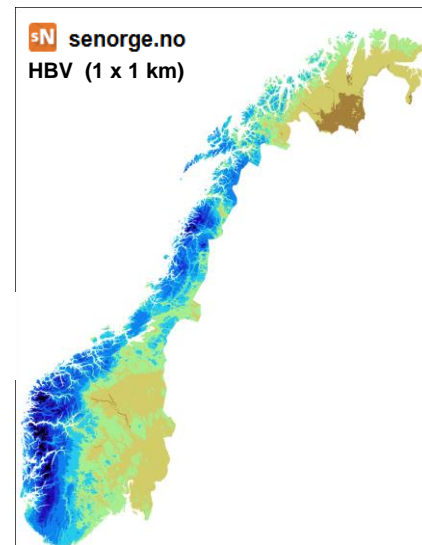
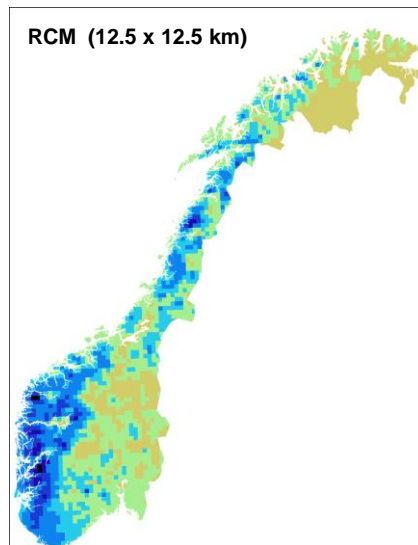
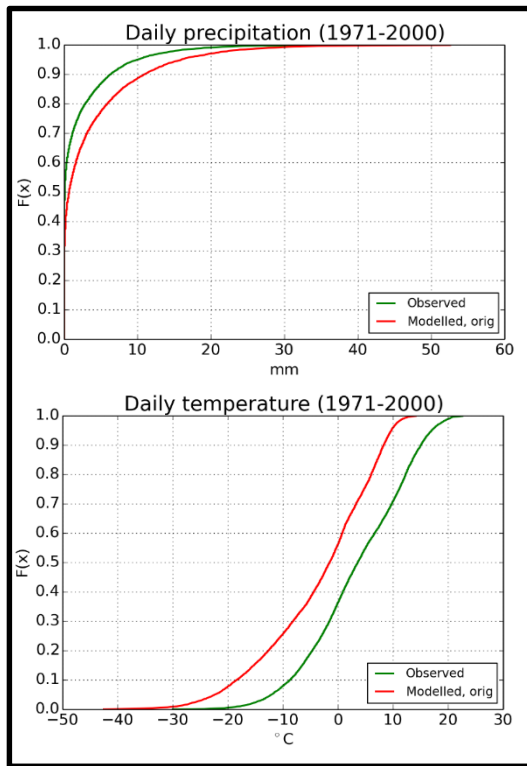
Hydrology department, NVE

Modelling chain for hydrological climate change impact study

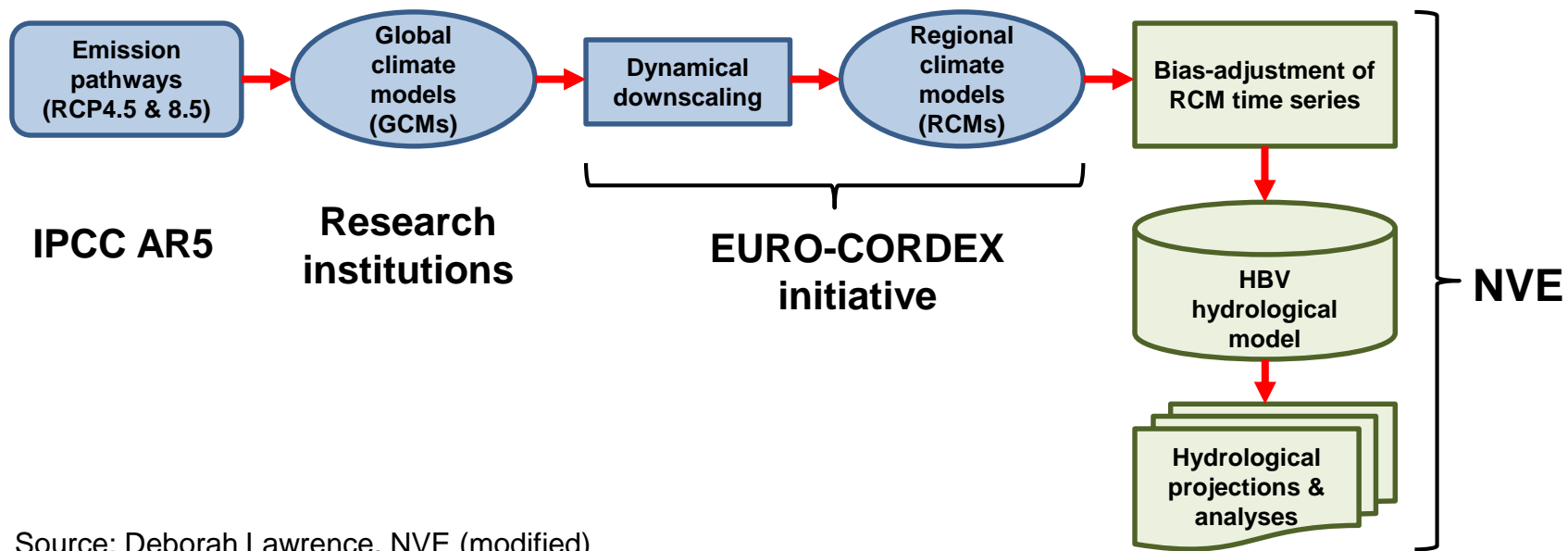


Source: Deborah Lawrence, NVE (modified)

Systematic bias & scale discrepancy



Post-processing of climate data



Source: Deborah Lawrence, NVE (modified)

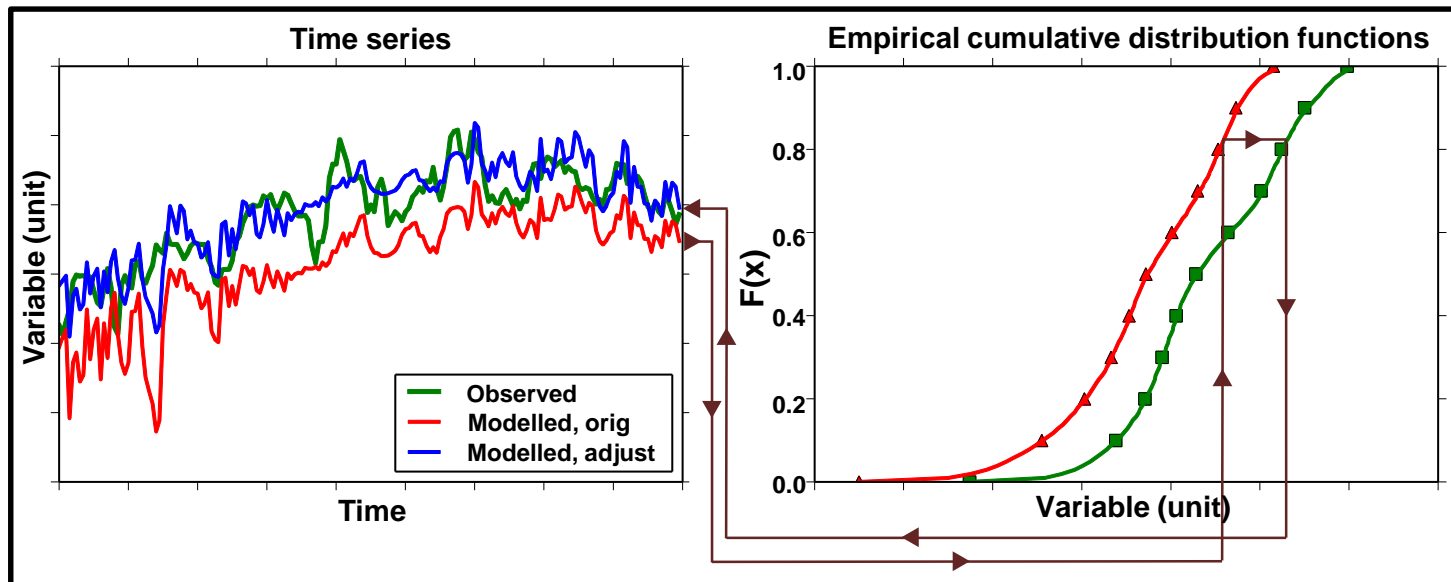
Climate input data

- 10 EURO-CORDEX GCM/RCM simulations of daily precipitation (P) and temperature (T) data (reference period: 1970-2005; projection period: 2006-2100)
- Original outputs re-gridded to 1 x 1 km using a simple nearest neighbour method
- SeNorge gridded data (1970-2005), which also have 1 km resolution, used as 'observed' data for bias-adjustment procedure

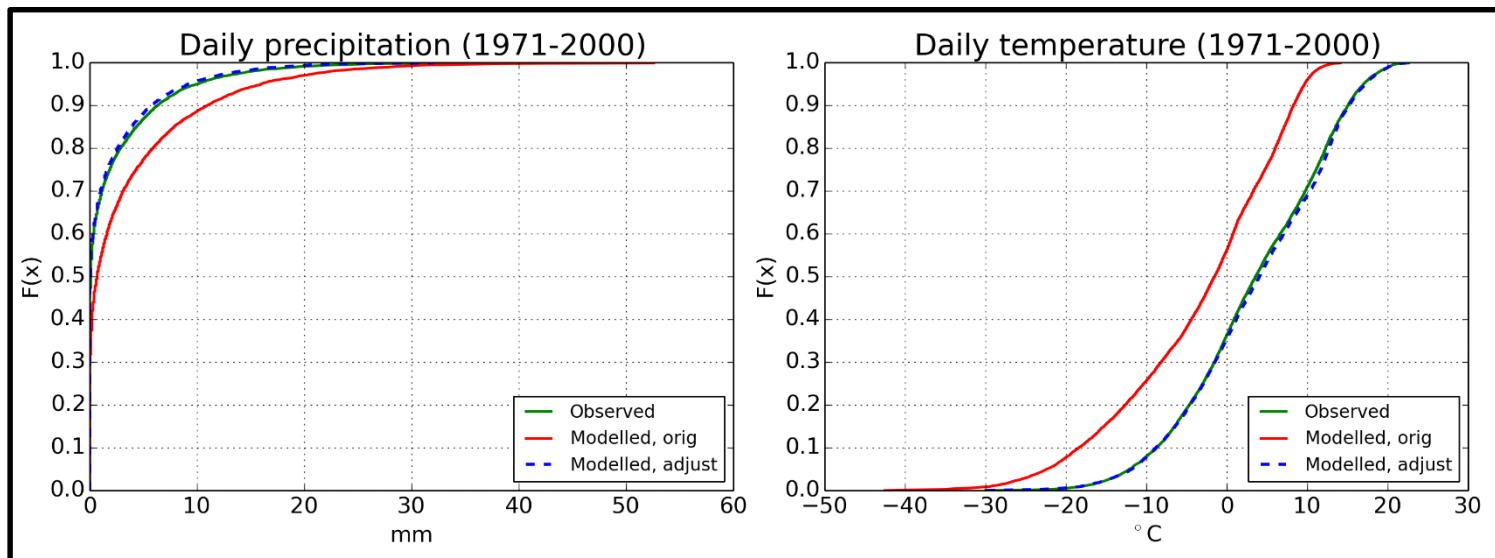
Method (reference period)

- Wet days correction by removing RCM rainy days below a threshold
- Empirical quantile mapping method (EQM) used to adjust climate data quantile by quantile based on transfer functions derived from observed and modelled empirical cumulative distribution functions
- Calendar-month and grid cell specific transfer functions

EQM



After bias-adjustment

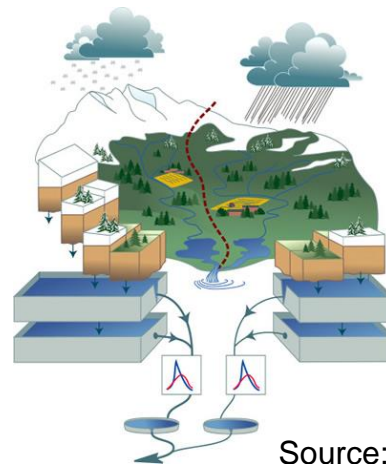


Method (projection period)

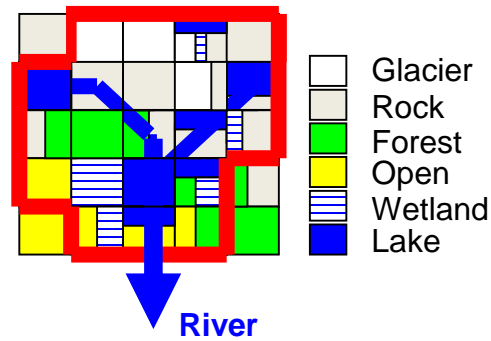
- Transfer functions derived from reference period also applicable to projection period
- Detrending time series prior to bias-adjustment (T : mean subtraction, P : mean division)
- EQM applied only to residual (T) / normalized (P) data
- Trend put back to EQM-adjusted data

Distributed HBV model

- Water balance modelling for 1 x 1 km grid cell
- Grid cells characterized by elevation and land use
- Calibration period 1991-2000, multi-criteria calibration



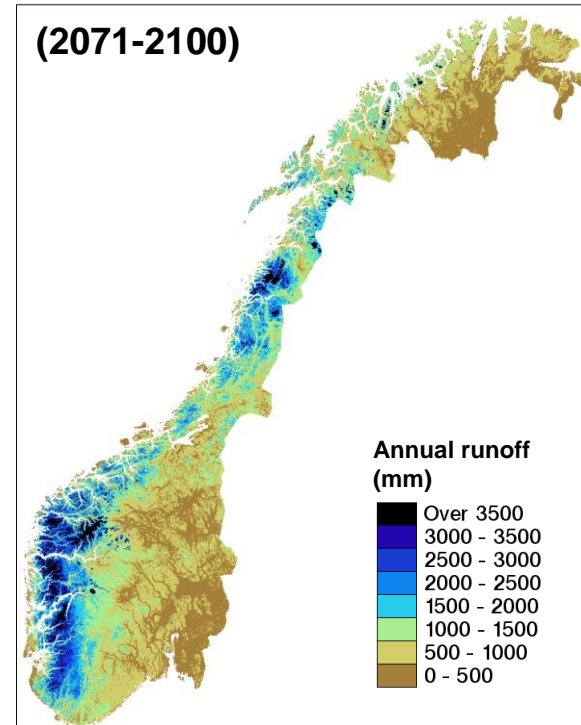
Source: SMHI

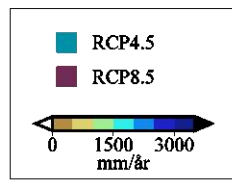
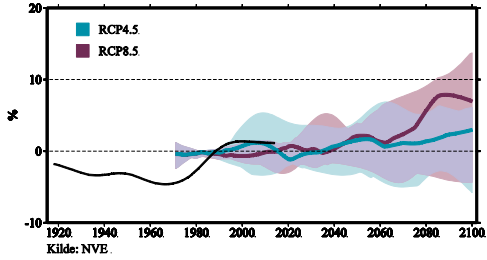
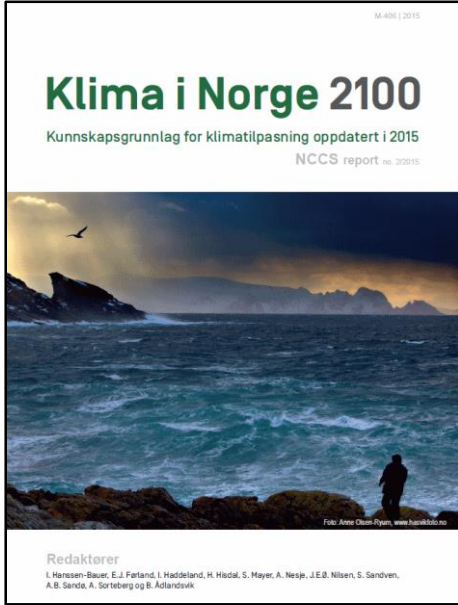


Source: Stein Beldring, NVE

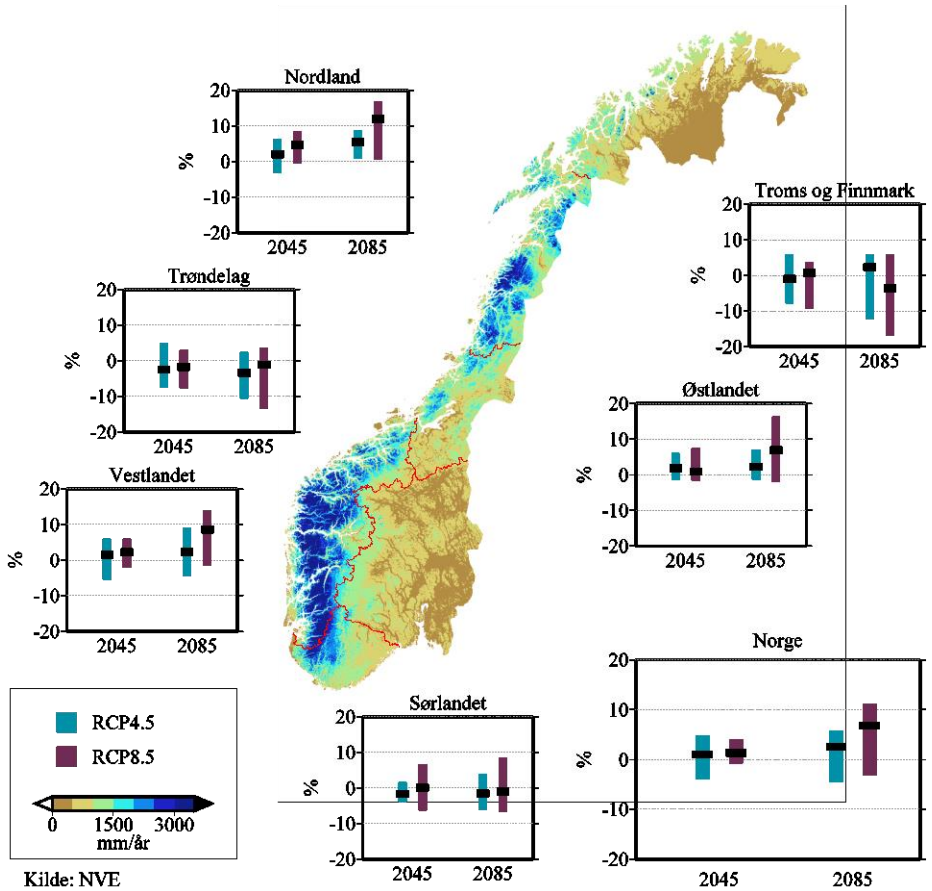
Hydrological responses

- Runoff
- Snow water equivalent
- Soil moisture deficit
- Groundwater
- + ...





Kilde: NVE



Bias-adjusted climate and hydrological projections will soon be made available on [NCCS website](https://www.nccs.no)

Klimaframskrivninger

Klimaframskrivninger er beregninger av hvordan klimaet vil se ut frem i tid.

Beregningene kan blant annet brukes som grunnlag for klimatilpasset dimensjonering og arealplanlegging knyttet til infrastruktur og bygninger, og som grunnlag til å studere hvilken effekt klimaendringer vil ha på natur og samfunn i fremtiden.

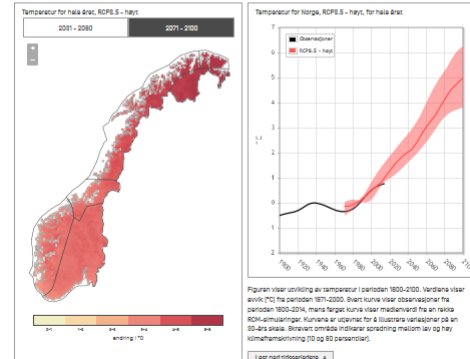
Norgeskartet og grafen nedenfor viser klimaframskrivninger for Norge. Verdene i kartet er medianverdier beregnet fra et ensemble av ti klimaframskrivninger. Kartet er delt inn i områder etter hvilken klimaindeks du har valgt (temperatur, nedbør, fion osv.). For noen klimaindeks er det ingen områdeinndelinger på kartet.

Klimaframskrivningene er basert på antakelser om framtidige utslipp av drivhusgasser (her kalt utslippsscenarioer) og globale og regionale klimamodeller.

For henvend på til peh@nve.no

Velg geografisk område, scenario, årstid og klimaindeksen du er interessert i. Klikk på spørsmålstegnet for en forklaring av valgene.

Velg en klimaindeks	?	Velg en periode	?
Temperatur	▼	Hele året	▼
Velg utslippsscenario	?	Velg et område	?
RCP6.5 - hvy	▼	Norge	▼



Kartet viser endring i middeltemperatur (°C) for perioden 1871-2020 til 2071-2100. Basert på endringene som vises i kartet, se for eksempel "Klima i Norge 2100", side 88 og 148 i tabellene.

[Kart for referanseperioden 1871-2000](#)

Nettsiden for å lære mer om de ulike klimaframskrivningene: <https://nve.no/meteorologisk/nytt/nytt-utslipps-scenarioer>
<https://nve.no/meteorologisk/nytt/nytt-utslipps-scenarioer/nytt-utslipps-scenarioer>

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