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NORWEGIAN STATIONS
FOR DAILY OBSERVATIONS
OF POLLUTION IN AIR AND PRECIPITATION

by

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GENERAL

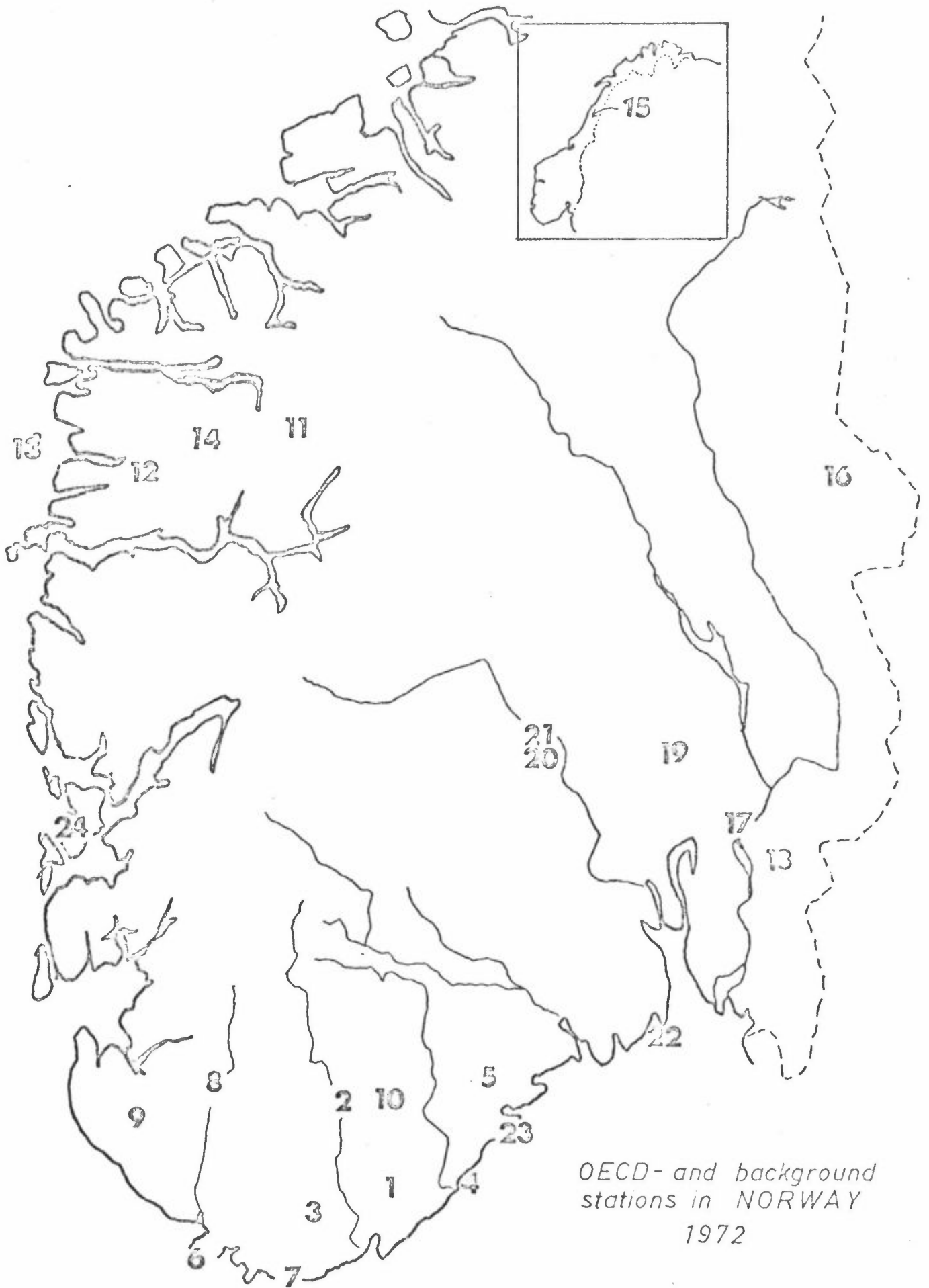
Since 1971, daily background sampling of SO₂ and sulphate in the air has been made at 8 stations and daily precipitation sampling at 24 stations (see map). The precipitation samples are analysed for strong acid, sulphate, pH, Na and Mg, and a collector of polyethylene (diameter 200 mm) is used.

The stations were established partly in connection with the OECD investigation of the long range transport of air pollutants and national programmes for investigation of adverse effects of air pollution on forest growth and fresh water fisheries.

The great number of stations has been necessary at the start, because of the large topographical variation on all scales up to 500 km (the large N-S directed mountain ridges in South-Norway). Additional stations are planned in South-Norway for the investigation of adverse effects, but for the OECD investigation a gradual reduction of stations in South Norway by means of correlation analysis, is intended. In North Norway, more stations probably will be established because of the observation of polluted snow the last winter (probably coming from east to southeast).

Most stations are places in areas minimally polluted by Norwegian towns and industrial areas, except for some stations which are established around the more densely populated Oslo-region (about 1 million inhabitants) for comparison of the pollution stress from this area and from outside. The greatest number of stations are placed along the south-coast, because the pollution in precipitation has its maximum in this area.

Meteorological stations operated by the Norwegian Meteorological Institute have as far as possible been used as sites to benefit from the meteorological observations and an established procedure. As a rule, the samplings are made south of the nearest buildings heated with coal, wood or oil, in order to avoid local pollution with winds from southernly directions. All precipitation samplers are places on grounds with permanent grass or heather. The collector is cleaned daily with distilled water, regardless of precipitation or not.



OECD- and background
stations in NORWAY
1972

STATIONS LIST

NO	NAME	METER a.m.s.l.	POS N	POS E	START	DISCONT	AIR	PREC	MI
1	Birkenes	190	58°23'	8°15'	1/11-71	-	x	x	
2	Bygland	215	58°50'	7°48'	1/11-71	17/4-71	x	x	
3	Finsland	275	58°19'	7°35'	1/11-71	-	x ¹	x	x
4	Flødevigen	10	58°26'	8°45'	1/11-71	17/4-72	x	x	
5	Gjerstad	240	58°53'	8°57'	1/11-71	-		x	x
6	Lista	13	58°06'	6°34'	1/11-71	-		x	x
7	Mandal	138	58°03'	7°27'	1/11-71	-		x	x
8	Skreådalen	475	58°49'	6°43'	1/11-71	-		x	x
9	Søyland	263	58°41'	5°59'	1/11-71	-	x	x	x
10	Tovdal	227	58°48'	8°14'	1/11-71	-		x	x
11	Bjørkhaug	324	61°38'	7°16'	25/6-71	1/7-72		x	x
12	Førde	42	61°28'	5°51'	25/6-71	15/7-72		x	x
13	Kinn	10	61°34'	4°48'	25/6-71	1/7-72		x	x
14	Skei i Jølster	205	61°34'	6°29'	25/6-71	-		x	x
15	Tustervatn	439	65°50'	13°55'	28/12-71	-		x	x
16	Tågmyra	536	61°25'	12°04'	26/12-71	-		x	x
17	Kjeller	120	59°59'	11°03'	2/2-72	-		x	
18	Løken	150	59°48'	11°27'	26/2-72	-		x	
19	Bislingen	680	60°14'	10°37'	26/3-72	-		x	
20	Grimelid	367	60°08'	9°36'	25/3-72	-		x	x
21	Norefjell	810	60°13'	9°31'	27/3-72	-	x	x	
22	Vasser	35	59°04'	10°26'	17/4-72	-	x	x	
23	Lyngør	20	58°38'	9°08'	18/4-72	-	x	x	
24	Fitjar	20	59°55'	5°19'	29/7-72	-		x	x

¹ Air measurements started 20/4-72

NO : refer to number in the map
 AIR : air measurement of SO₂
 PREC: precipitation
 MI : Meteorological Institute,
 precipitation station.

DESCRIPTION OF THE STATIONS

The geographical distribution of the stations is given on the map. The numbers refer to the station list, which also gives the position coordinates, period of operation, and other details.

1 Birkenes

The site lies in a complex and moderately hilly terrain, with moors and forests, and with 100 meters as typical height differences. The area is crossed by a deeper and narrow valley, about 150 m below the station. In general, this terrain is gently sloping SE towards the coast, about 20 km distant. The site itself is in a small grass covered basin surrounded by forest. The nearest inhabited farms are several kilometers away. The town Kristiansand (60 000 inhabitants) lies 30 km towards SW.

2 Bygland

The station is situated near a NS-directed lake, with mountain sides about 600 m high. The site is in a moderately populated area. The station was closed down because the correlation analysis with other stations indicated an influence from local pollution sources.

3 Finsland

This station is situated in an undulating terrain with 100 meters as typical height difference. The site itself is about 20 m above the local river level. The surrounding area is partly populated. Kristiansand is about 30 km apart towards SE.

4 Flødevigen

The station lies close to the coast line in the bottom of a bay and 10 m above the see level. The station was closed down, because comparison with other stations indicated influence of pollution from the nearest town (Arendal).

5 Gjerstad

The station is situated in a short, steep valley sloping towards ENE, with mountain ridges 100-150 m above the site. The site lies on valleyside facing north and about 60 m above the bottom of the valley. The general slope of the moderately hilly terrain is towards SE (the coast is 20 km away).

6 Lista

This station is situated to the W of a plain peninsula, with exposure to the ocean towards N and S. The distance from the coast is 200-300 m. With on shore wind, the correction for marine sulphate in the precipitation may be very high.

7 Mandal

The station is situated on a hill, 1-2 km north of the small town of Mandal, and approximately 130 m higher. The distance to the coast is approx. 3 km. The terrain is complex, with typical height differences of 50 to 150 m.

8 Skreådalen

475 meters a.m.s.l.. This inland station (100 km from the coast) is situated 6 km east and 150 m lower than a water-shed on the large mountain ridge which divide South Norway in an eastern and a western part. The site is in a narrow and sparsely populated sidevalley sloping towards NE. Typical heights of the surrounding mountains are 700 to 800 meters.

9 Søyland

This station is situated in a moderately rough terrain with an irregular valley system (height differences from 100 to 300 m). The site lies about 70 m above the river bed. The local valley slopes towards S. In general, the area slopes towards W to S. The area has a sparse population.

- 10 Tovdal
The station is situated on the northeast slope (about 50 m above the river bed) of a valley, which is oriented towards SE like the general terrain. The mountain ridges is from 300 to 500 m above the valley bottom. The valley is very sparsely populated. The distance from the coast is about 60 km SE.
- 11 Bjørkhaug_i_Jostedal
The station lies in a very rugged terrain near the glacier Jostedalsbreen on a steep hillside facing south, and about 250 m above the river bed. The narrow valley slopes towards south and the Sognefjord. The mountain ridges are from 1000 to 1500 m higher than the valley bottom. The valley is sparsely populated. This station, together with Førde (12) and Kinn (13) was closed down the 1st July, 1972, at the end of a special measuring programme.
- 12 Førde
The station is 2 km NW of the small town Førde, on the north side of a EW directed fjord, and with surroundings mountains of heights up to 900 meters. The station was closed down the 1st July, 1972 (see station 11).
- 13 Kinn
This station is situated on the west side of the island Kinn on the west coast. The terrain is moderate in roughness. This station was closed down the 1st July, 1972 (see station 11).
- 14 Skei_i_Jølster
The station is situated on the north side of an WSW-E directed lake. The surrounding mountains are about 1000 meters above the lake level. Locally, the site is 1 km NE of a small village. Otherwise, the area is sparsely populated.
- 15 Tusteryvatn
This station is situated in North-Norway, 70 km east of the coast, and on the westside of a large lake about 60 m above the lake level. The lake is surrounded by mountains mostly 1000 meters above the lake-level. The population in the area is very sparse. There is a large aluminium smelting plant, 30 km to the west of the station.

16 Tågmyra

This station is situated in an area with hilly terrain (typical height difference: 500 m), which in general slopes towards S and W. The nearest village is 4 km to the east. The site itself is on the south slope of a ridge, about 130 m above the river-bed.

17 Kjeller

This station is situated 15 km NE of the city of Oslo (0,5 mill. inhabitants). The prevailing wind directions are SW and NE. The site itself is situated on the NW side of the small town Lillestrøm, with approximately 15 000 inhabitants and some local industry.

18 Løken

The station is in a complex and moderately hilly terrain (height differences 200-300 meters). The site is in a residential area, surrounded by forest land. The nearest village is 1,5 km to the SE. The distance to Oslo towards WNW is 40 km.

19 Bislingen

The station is situated on the highest mountain in the district, 35 km north of Oslo. Otherwise, the terrain is moderately hilly.

20 Grimelid

367 meters a.m.s.l.

21 Norefjell

810 meters a.m.s.l.. This station-pair is established for comparison of precipitation at different heights. The terrain is very rugged. Grimelid is situated on a NW slope about 200 m above the valley bottom. Norefjell station is situated on the south slope of the mountain. The distance to Oslo (towards SE) is about 70 km.

22 Vasser

This station is situated on a coast island, on the west side of the Oslofjord. The terrain is gently undulating. North of the station, the island is somewhat populated but mainly in summertime. The site is situated on a peak about 40 m above the sea-level.

23 Lyngør

The station is situated on an island on the south-east coast. The terrain is gently undulating. The site itself is placed on a 30 m high ridge SE of the populated area, and on the NW side of the island. The distance from the station to the ocean shore (towards SE) is 700-800 m).

24 Fitjar

The station is situated on the NW-side of a great mountaineous island on the west coast, with mountain heights of about 500 m. The site itself is placed on a slope facing northwards, in the bottom of a bay coming in from N. 200 m to the north lies a small canning company (sprat), and 300 m to the east a small village. 20 km to the south-east is a small town with a big shipbuilding-yard. The distance to Bergen towards NNE with about 200 000 inhabitants, is 60 km.