Radiation

Innholdsfortegnelse

Radiation

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We are all surrounded by radiation. Most of this is natural radiation from the sun and from naturally occurring radioactive materials in the bedrock and soil. However, both our own behaviour and industrial activities can increase our exposure to different forms of radiation.

The strength of the UV radiation from the sun varies depending on the time of day, the season, the cloud cover, the thickness of the ozone layer, and reflection from water and snow. Photo: Flickr

After the 1986 Chernobyl accident, Norway received substantial radioactive fallout. Even now, sheep in some parts of the country must be put on a 'clean feeding' regime before they can be slaughtered for food. Photo: Kim Abel, Naturarkivet.no

Radioactivity levels in Norway are generally low. Seaweed, fish and shellfish absorb radioactive substances from seawater, but levels in Norwegian fish and other seafood are so low that there is no health risk. Photo: Bård Bredesen, Naturarkivet.no

Radon in the home accounts for about half of all radiation exposure for the average Norwegian. The authorities recommend measuring radon levels in the home, using a track-etch detector as shown here or an electronic device. Photo: Norwegian Radiation Protection Authority

Measuring radioactive pollution in seawater. Photo: Norwegian Radiation Protection Authority

Ultra-violet radiation

The sun is the most important source of radiation: without it, there would be no life on earth. Sunlight is vital to human health, but can also be harmful. Research has for example shown a relationship between sunbathing and the frequency of skin cancer.

Sunlight consists of a wide spectrum of radiation, including ultra-violet (UV) radiation. Sunbeds and sunlamps also emit UV radiation, and result in much more intense exposure than Norwegian summer sunlight. UV radiation can cause sunburn, skin ageing, damage to the immune system, skin cancer, snow blindness and cataracts. However, in small doses UV radiation has a positive effect, stimulating the production of vitamin D.

The Norwegian Radiation Protection Authority has a nationwide network of measuring stations for UV radiation, and is also responsible for the approval and control of tanning salons in Norway.

Radioactive pollution

There are various sources of radioactive pollution in the Norwegian environment, but levels of radioactive substances are generally low. The Radiation Protection Authority therefore considers radioactive pollution to be of little significance for human health in Norway.

More than 30 years after the Chernobyl disaster, the transfer of radioactive substances from the soil to plants, animals and people is still continuing. To ensure that food is safe, concentrations of caesium-137 are controlled in meat and milk from sheep, cattle and domestic reindeer that graze in areas where fallout was heaviest.

The Norwegian marine areas receive inputs of radioactive substances from several sources. For example, produced water, which always accompanies oil and gas extracted from the reservoirs, contains naturally occurring radioactive substances from the bedrock. Radioactivity in seawater is absorbed by seaweed, fish and shellfish, and people can also receive radiation doses when they eat fish and other seafood. However, people who eat normal amounts of Norwegian seafood receive only low doses of radiation.

1. Radioactive contamination

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There are various sources of radioactive contamination in the Norwegian environment, but levels of radioactive substances are generally low.

The Chernobyl accident in 1986, resulted in large amounts of radioactive fallout in parts of Norway. Photo: Wikimedia Commons

Norway´s seas receive inputs of low levels of radioactive substances. Photo: The Norwegian Radiation and Nuclear Safety Authority

Oil and gas production results in discharges of water containing low levels of radium isotopes. Photo: iStockphoto.com

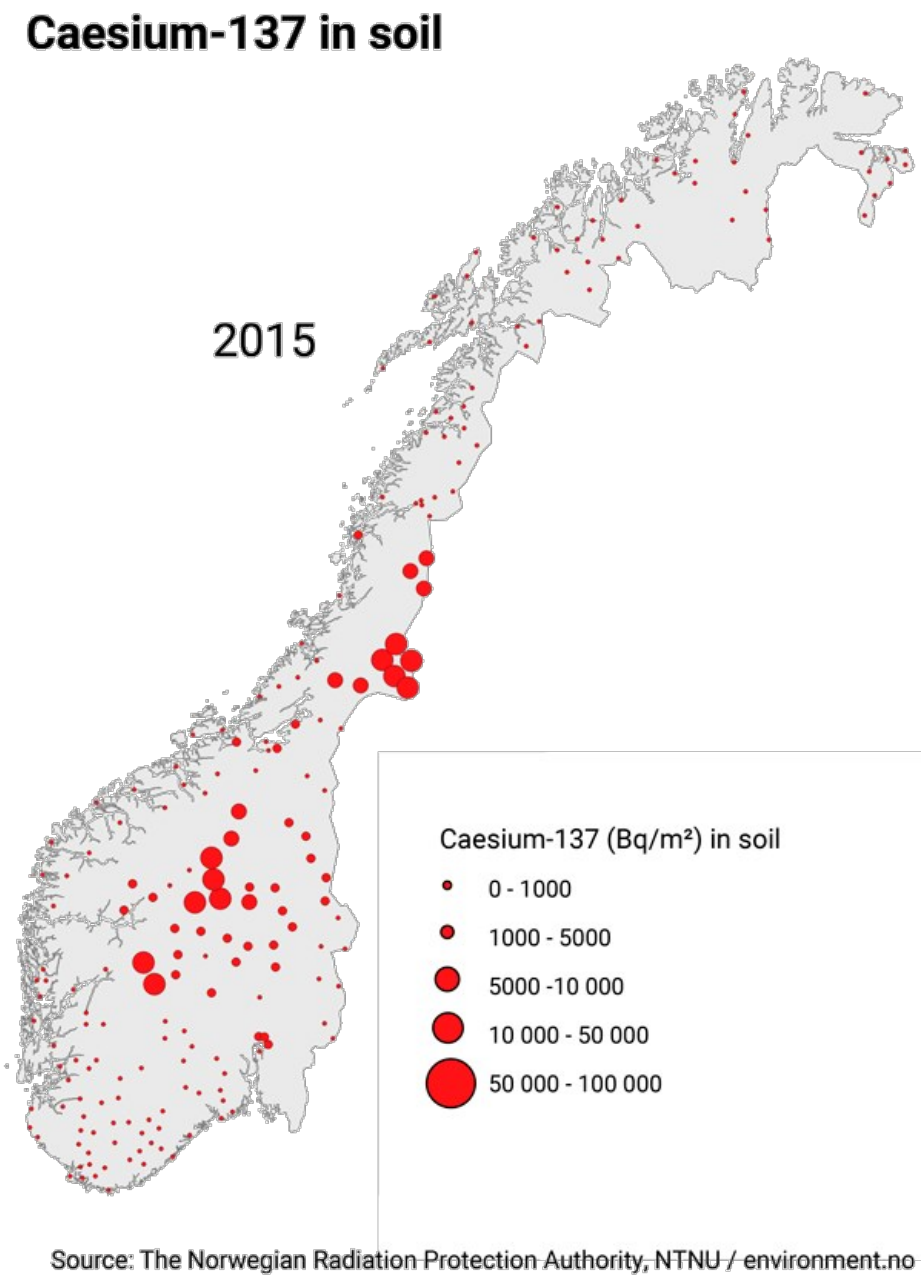
Some parts of the populations are more vulnerable to radioactive contamination resulting from the Chernobyl accident than others. These include reindeer herders. Photo: Runhild Gjelsvik, the Norwegian Radiation Protection Authority

STATE

Low levels of radioactive contamination

Norway has received inputs of radioactive substances since the 1950s. In the 1950s and 1960s, fallout following the tests of nuclear weapons in the atmosphere was the main source of radioactive contamination in Norway.

The Chernobyl accident in 1986 resulted in substantial radioactive fallout in parts of Norway. Today, the levels of radioactive contamination are generally low. The highest levels are found in parts of Central Norway.



The Norwegian marine areas receive inputs of radioactive substances from the Baltic Sea, from the Sellafield nuclear reprocessing plant in the UK and from oil and gas production on the Norwegian continental shelf.

IMPACT

Little significance for human health

More than 30 years after the Chernobyl accident, radioactivity is still being transferred from the soil to plants and animals. The concentrations of caesium-137 are still measured in meat and milk to ensure that food is safe.

Radioactivity in seawater is absorbed by seaweed, fish and shellfish, and people can also receive radiation doses when they eat fish and other seafood. However, people who eat normal amounts of Norwegian seafood only receive low doses of radiation.

All in all, the Norwegian Radiation Protection Authority considers radioactive contamination to be of little significance for human health in Norway.

PRESSURE

Oil and gas activities an important source

Oil and gas production is an important source of radioactive substances in Norwegian marine waters. Produced water contains naturally occurring radioactive substances from the bedrock and is discharged to the sea or may precipitate out to form scale on pipelines and other production equipment.

Technetium-99 discharged from Sellafield has affected Norwegian waters. Technetium-99 has a very long half-life and accumulates in marine organisms, particularly in seaweed and shellfish. Discharges have been greatly reduced the last years, and technetium-99 levels in seaweed, fish and shellfish are therefore decreasing.

RESPONSE

Monitoring, clean feeding and consumption advisories

The Norwegian Radiation Protection Authority works to ensure that the harmful effects of radiation on humans and the environment should be as small as possible. In order to chart the concentrations of radioactivity and follow trends over time, annual monitoring of nature, food and radiation doses received by the population is carried out.

Since the Chernobyl accident, extensive monitoring of radioactive contamination in foodstuffs such as dairy products, sheep, reindeer, game, wild mushrooms and freshwater fish has been performed. Countermeasures like clean feeding, early slaughter time and caesium binders are used to reduce contamination of sheep, cattle and semi-domesticated reindeer.

The Norwegian Radiation Protection Authority also carries out a marine monitoring programme to chart the trends of radioactive contamination in water, sediments, fish and other important marine species.

When it comes to the oil and gas industry, Norway´s goal is to reduce the emissions of naturally occurring radioactive substances. The levels of these substances should be close to the natural background levels by 2020.