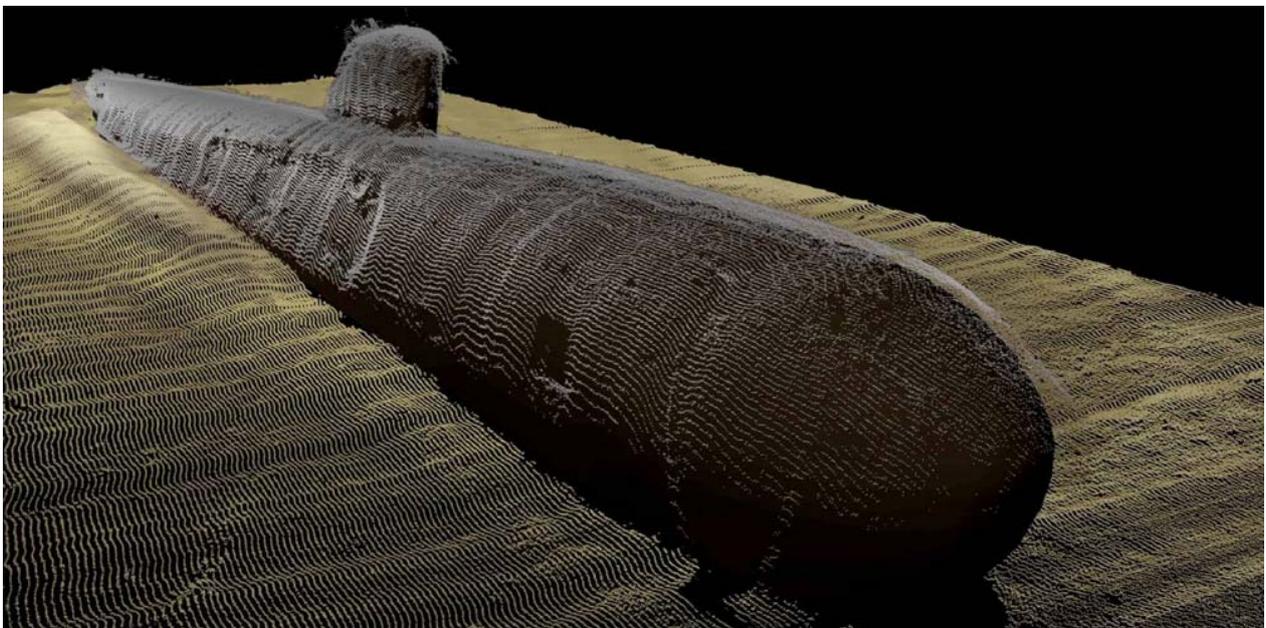




Joint Norwegian-Russian expedition to investigate the sunken nuclear submarine K-159 in the Barents Sea

In the summer of 2014, a joint Norwegian-Russian expedition will visit the site in the Barents Sea where the Russian nuclear submarine K-159 sank in 2003. K-159 represents a potential large source of radioactive contamination to the Arctic marine environment. The purpose of the expedition is to obtain new, up-to-date information about the level of radioactive contamination in the marine environment in the immediate vicinity of K-159 and in adjacent areas of the Barents Sea. The last joint international expedition to the site of K-159 took place in 2007.

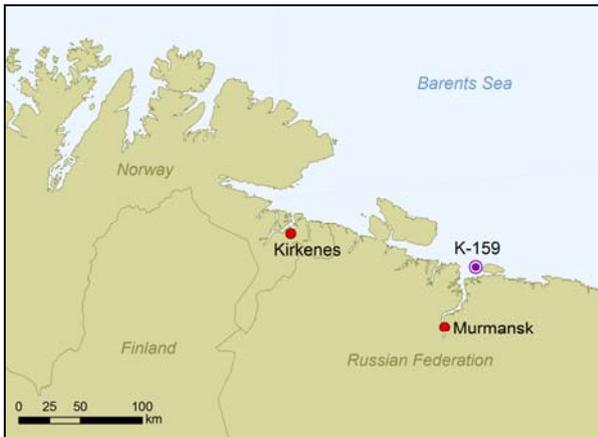


*Multi-beam sonar image of the sunken nuclear submarine K-159 on the seafloor of the Barents Sea in 2007.
Photo: ADUS DeepOcean and Salvage & Marine Operations (S&MO) of the UK MOD.*

On the 30th of August 2003, the decommissioned nuclear submarine K-159 foundered and sank in heavy seas whilst under tow North West of Kildin Island in the Barents Sea. K-159 was a November class attack submarine and belonged to the Former Soviet Union's first generation of nuclear submarines. K-159 was being towed with the aid of flotation pontoons from a base at Gremikha to the Poliarny shipyard for final dismantlement. The loss of one or more of the flotation pontoons was determined to be the cause of the eventual sinking. Nine members of the towing crew were lost with the submarine.

K-159's two 70MWt nuclear reactors had been shut down since 1989 but still contained around 800 kg of spent nuclear fuel. No nuclear missiles were on board K-159 at the time of sinking.

It has been estimated that the reactors on board K-159 contained an inventory of some 6.6 PBq in 2000. Thus K-159 represents the single largest potential source of radioactive contamination to the Arctic marine environment. K-159 lies on the seafloor at a depth of 246 m in Russian territorial waters at a distance of less than 130 km from the border with Norway.



Location of the sunken nuclear submarine K-159.

Previous monitoring

Monitoring of the environment around K-159 was carried out shortly after it sank by experts from the Russian Northern Fleet and the Kurchatov Institute and again later in 2003 and 2004. The conclusion from these studies was that no leakages had occurred from either of the two reactors.

In 2007, an international expedition to investigate K-159 took place under the framework of the International Programme for Arctic Military Environmental Cooperation (AMEC). Tasks carried out included the measurement of radiation levels above the reactor section and within the external hull of the submarine, as well as sampling of seawater and sediments around K-159. No indication of any leakage was found during this expedition.

Additionally in 2007, sonar surveys of K-159 revealed that the aft end of the hull had snapped off after the submarine hit the seafloor stern first, with the remaining main part of the submarine now lying upright.

Considering that the reactors of K-159 were not prepared for dumping at sea and that K-159 hit the seafloor with enough force to snap the hull, there are concerns over the potential for leakages from the two reactors in the future.

2014 joint expedition

The expedition will carry out radiation measurements around the hull of K-159 and visually document the submarine with the use of a remotely operated submersible. In addition, environmental samples of seawater, sediments and fish will be collected close to K-159 and in adjacent areas to study in more detail the levels of radioactivity in the environment.



K-159 under tow on the way out from Gremikha in 2003 with floatation pontoons. Photo: The Russian Northern Fleet.

The expedition participants

The expedition will take place on the Russian research vessel *Ivan Petrov* and will last approximately 3 weeks.

From Norway, there will be participants from the Norwegian Radiation Protection Authority, the Institute of Marine Research and the University of Life Sciences. From Russia, there will be participants from the Federal Service for Hydro-meteorology and Environmental Monitoring (Roshydromet), the Kurchatov Institute and the Yuzhmorgeologiya Research Centre. In addition, the International Atomic Energy Agency (IAEA) will participate as observers.

Detailed analyses of the samples collected will be performed by both Norway and Russia. There will be close collaboration over the analyses, reporting and any further action.

Importance of the expedition

There is great international interest in the monitoring of potential sources of radioactive contamination to the Arctic. The joint expedition has been the subject of discussion by the Joint Norwegian-Russian Commission on Environmental Protection and is being financed through the Norwegian Government's nuclear action plan.

It is important to carry out such monitoring in the Northern Sea areas as this provides us with updated knowledge on the status of radioactive contamination in the marine environment. Such information is important for the management of marine resources in these areas.