

STATION 8: HALLIG LANGENESS, GERMANY

Background Information

Watch the [video on Hallig Langeness, Germany](#).

Crossing the polar ice cap, you arrive on an island in the North Sea. The sounds of screaming seagulls and breaking waves welcome you back to Germany. Located at 8° 36' E, 54° 38' N, Hallig Langeness is a village on one of the Halligen Islands. Fully surrounded by the turbulent North Sea, flood waters are a daily occurrence when the tide comes in.

When the North Sea tide goes out, it really goes out! The water line disappears into the horizon. When the North Sea tide comes in, it returns with a fierce surge of rapidly rising water. Early settlers built artificial hills as landscaping features. Today those hills are a refuge from rising sea waters. Entire farms moved upland onto the human-made hills called terps.

The North Sea draws tourists to Halligen. During low tide, when the wet, sandy bottom of the North Sea is exposed, tourists travel from the mainland to the island by a traditional open-air cart train. Residents of the island depend on ferries for food and other supplies.

In general, the temperatures in the Atlantic climate of the Halligen Islands are cooler than the rest of Germany, except in winter when warmer temperature prevail. The warmer temperatures are the result of ocean currents and prevailing winds traveling over water.

Events in Greenland are causing changes in the North Sea. Ice masses in Greenland are melting at an accelerating rate. During the twentieth century, glacial melt combined with seawater expansion raised sea levels by 8 to 10 inches. Freshwater from melting land ice also has the potential to alter ocean currents by changing the density of salt water. The habitable climates of northern Europe depend on the warm Atlantic Ocean current, known as the Gulf

Stream. How a change in the Gulf Stream might affect European climates in the future is being researched by climate modeling at the Alfred-Wegener-Institut in Bremerhaven.

In the meantime, residents of the Halligen Islands will continue to build taller terps and engineer homes to withstand rising sea levels and stronger storm surges. Read more about climate change projections for Germany.

Modeling a Terp

Identify materials that are the most environmentally friendly for inhabitants of the Halligen to use for terps. Are there other options for the residents of Halligen? Write a proposal using scientific reasoning to support your alternative argument.

Climate Change

Germany is responding to climate change through public policy and actions by government, industry, and private citizens. As a member of the European Union, Germany is working with other European countries to study and address anticipated changes in climate. Germany is also a member of the United Nations [Intergovernmental Panel on Climate Change](#).

In countries such as Germany, scientists are modeling climate change impacts to inform government policy and planning for adaptation and mitigation. Your organizer has a summary of the predicted changes for Germany in the next 50 years.

The following summarizes expected changes by 2070–2100 compared to 1961–1990. The projections assume moderate increases in greenhouse gas emissions.

Projections are quoted from the *Umwelt Bundesamt*, the German Environmental Protection Agency.

- The average temperatures rise regionally and seasonally, varying by about +3.5°C (summer: +1.5°C to +5°C; winter: +2°C to +4.5°C).
- Not only will the average temperature in Germany increase, but high temperatures will also occur, especially in the summer.
- It is expected that there will be a decline in precipitation during the summer months. The forecasts range between –25 and +5 percent. It is highly likely that the proportion of heavy precipitation in total precipitation will increase in the summer.
- Regarding total precipitation in winter, most regions in Germany expect an increase (about –4 to +20 percent). The largest increase is expected to occur in northern Germany. However, the regions far to the south will probably not be subject to any substantial change. It is expected there will even be a slight decrease. Even in winter, heavy rainfall will be recorded more frequently in the future.
- Extreme wind speeds will also occur more often in the future.

In response to climate change projections, Germany is taking proactive measures to mitigate or adapt to impacts of climate change.