

Environmental and Geological Research Department

This department conducts research on the preservation of the local/global environment and biodiversity, as well as on measures to prevent and reduce geological disasters such as earthquakes, volcano eruptions and landslides. Research also includes studies on the effective use and preservation of natural resources like hot springs, groundwater and minerals.

Organizational structure

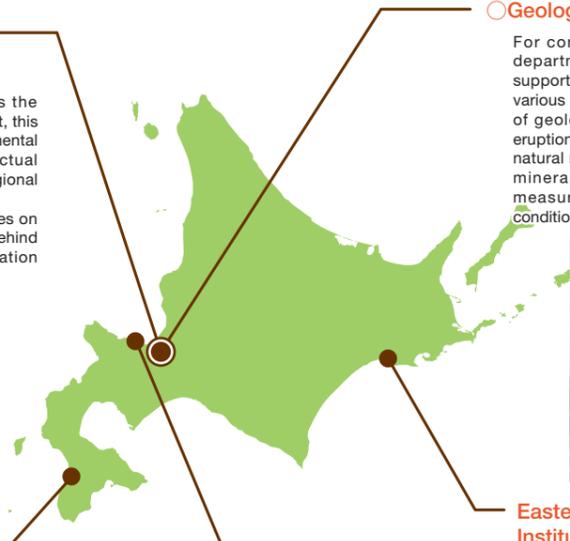
○Institute of Environmental Sciences (Sapporo City) (Environmental and Geological Research Department)

Besides planning and coordination services as the Environmental and Geological Research Department, this institute promotes measures in the field of environmental conservation by offering advice based on the actual conditions and analysis results of the local and regional environment.

The field of the natural environment involves studies on biodiversity conservation, including mechanisms behind ecosystems, the conservation of wildlife, population management and basin area environment.



Southern Hokkaido Wildlife Research Station, Institute of Environmental Sciences (Esashi Town)



○Geological Survey of Hokkaido (Sapporo City)

For continental areas (including coastal areas), this department conducts research and provides technical support on the establishment and high-level application of various geological databases, the prevention and reduction of geological disasters, such as earthquakes, volcano eruptions and landslides, the development and utilization of natural resources, including hot springs, ground water and minerals, and environmental conservation related to measures against mine disasters and the geological conditions of artificial marshlands.



Eastern Hokkaido Wildlife Research Station, Institute of Environmental Sciences (Kushiro City)

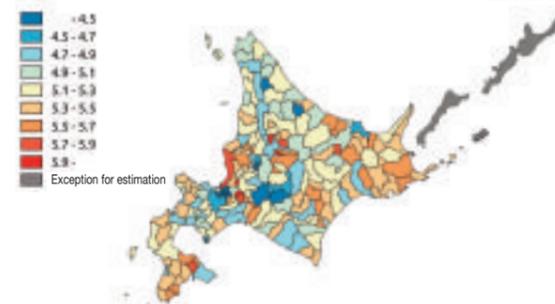
Marine Geoscience Center, Geological Survey of Hokkaido (Otaru City)

Major current research and development

- Feasibility study on the production/utilization of hydrogen derived from sewage sludge in Hokkaido (Institute of Environmental Sciences) [open type research: 2017 - 2018]
- Modelling of geothermal structure and assessment of geothermal resource potentials in the Niseko area (Geological Survey of Hokkaido) [priority research: 2017 - 2019]
- Establishment of technology for capturing sika deer to reduce pasture damage and improve the utilization rate of venison (Institute of Environmental Sciences) [priority research: 2018 - 2020]
- Investigation for the application of chemical substances simulation model in Hokkaido (Institute of Environmental Sciences) [ordinary research: 2016 - 2018]
- Investigation for the evaluation of natural environments in agricultural landscapes for biodiversity conservation (Institute of Environmental Sciences) [ordinary research: 2017 - 2019]
- Research on the population trend of brown bears and human-bear conflicts (Institute of Environmental Sciences) [ordinary research: 2017 - 2021]
- Research on the stability of heavy metals sorbed on natural geological materials (Geological Survey of Hokkaido) [ordinary research: 2016 - 2018]
- Research on an advanced liquefaction risk map based on ground boring data (Geological Survey of Hokkaido) [ordinary research: 2017 - 2019]
- Research on a groundwater management/utilization system (3) (Geological Survey of Hokkaido) [ordinary research: 2018 - 2022]

Major recent achievements

Environmental conservation field



Estimate of CO₂ emissions per household

To reduce household CO₂ emissions, we have visualized emissions by household type, such as building style and the number of people per household.



Proposal of measures for fishery environment conservation

To conserve the water environment and the fishing ground environment, we clarify the relationship between material cycle in water including river basins and aquatic ecosystem.

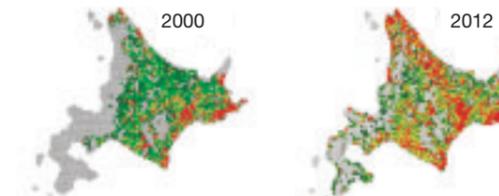
Natural environmental field



The bumblebee as a monitoring index of the coastal grassland ecosystem

Development of the monitoring methods for biodiversity conservation

We develop the monitoring methods on population dynamics of animals and plants, and the evaluation methods on biodiversity in Hokkaido.



Changes in the sighting perunit effort of sika deer reported by hunters.

Development of appropriate methods for wildlife management

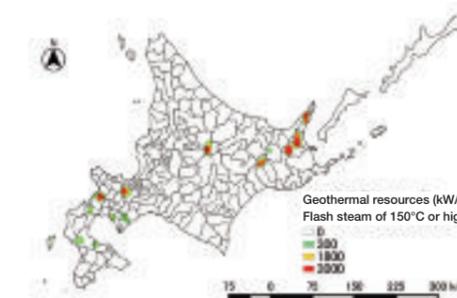
We have developed conservation methods and techniques to prevent crop damage based on population monitoring and inhabitation situations.

Geology field



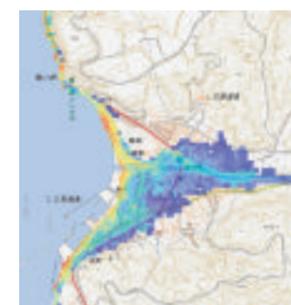
Valuation of the volcanic activity of Tokachidake volcano, where fumarolic activity and volcanic inflation continue

We have constructed models of the internal structure of the volcanic edifice and the hydrothermal system to evaluate volcanic activity.



Geothermal resource map (150°C or higher) prepared in a study commissioned by the Hokkaido government

We provide a highly accurate geothermal potential map, thereby contributing to risk reduction in geothermal development and its promotion.



Research for tsunami disaster mitigation

We have conducted a survey of tsunami deposits that occurred on the Sea of Japan, Hokkaido. Distribution of tsunami deposits and numerical simulation successfully provide a reliable tsunami-caused flood map.



Survey study on slope disasters due to heavy rain

To deal with slope disasters due to heavy rain, which frequently occur in Hokkaido, we consider terrain unique to cold regions and evaluate slope disaster-prone areas. We are also engaged in the development of a surveying technique using UAV.