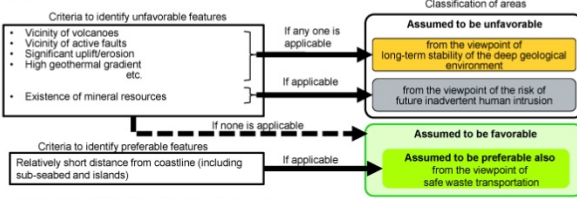


# Nationwide Map of "Scientific Features" relevant for Geological Disposal

## Scientific Features and Classification of Areas Identified on the Map

### 1. Classification of areas in terms of scientific features

- The application of criteria by the Geological Disposal Technology Working Group for identifying features and nationwide classification of areas is illustrated in the figure below. As shown in this figure, areas "assumed to be favorable," with a relatively high probability that favorable features for geological disposal could be confirmed, are classified as candidates for future site-specific investigations.
- The Nationwide Map of "Scientific Feature" relevant for Geological Disposal does not, however, directly indicate whether a specific area has suitable scientific features for constructing a geological repository. Stepwise investigation and careful evaluation of candidate sites according to the Final Disposal Act are essential for selecting a final repository site; this takes into account various other important features that are not included in the Map.



### 2. Criteria to identify features for classification of areas

#### Criteria to identify unfavorable features

Relevant events and processes	Consequence or impact required to be precluded	Criteria
Volcanic activity	Magma intrusion affecting physical isolation	<b>Vicinity of volcanoes:</b> Within an area of 15 km from the center of individual Quaternary volcanoes (or the caldera rim if this is greater)
Fault activity	Fault activity affecting containment	<b>Vicinity of active faults:</b> Within the crush zone around an active fault, the width of which is about 1/100 of the fault length
Uplift/erosion	Uplift/erosion affecting physical isolation	<b>Significant uplift/erosion:</b> Net erosion greater than 300 m/100,000 years, in coastal areas, accounting for sea-level change, uplift rate greater than 90 m/100,000 years
Geothermal activity	Geothermal activity affecting containment	<b>High geothermal gradient:</b> Geothermal gradient greater than about 15 °C/100 m
Volcanic hydrothermal fluids and deep-seated fluids	Intrusion of exotic groundwater affecting containment	<b>Presence of hydrothermal water or other deep-seated groundwater:</b> Groundwater with pH less than 4.8
Unconsolidated sediments	Geotechnical instability affecting safe construction	<b>Location in unconsolidated sediments:</b> Sediments younger than Middle Pleistocene as cover to a depth of greater than 300 m
Pyroclastic flows, etc.	Pyroclastic flows, etc. affecting safe operation	<b>Susceptibility to distant impacts from pyroclastic flows, etc.:</b> Traces of Holocene pyroclastic deposits, volcanic rocks and volcanic debris
Mineral resources	Future inadvertent human intrusion	<b>Existence of mineral resources:</b> Known oil, gas and coal fields, and metallic minerals

#### Criteria to identify preferable features

Relevant events and processes	Requirements for preferring	Criteria
Transportation	Safe waste transportation in terms of radiation exposure and nuclear security	<b>Relatively short distance from coastline (including sub-seabed and islands):</b> Within about 20 km from coastline

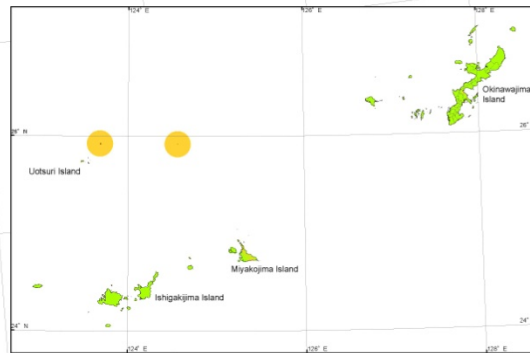
### Process of mapping

- Presence of features is investigated for individual areas based on these criteria and are colored based on applicability in the following order:
  - Unfavorable features relevant to long-term stability of the deep geological environment (orange)
  - Unfavorable features relevant to potential future inadvertent human intrusion (silver)
  - Preferable features for safe transportation (green, coastal areas)
- Remaining areas where such features are not present are colored light green. Areas colored green and light green are classified as "assumed to be favorable".

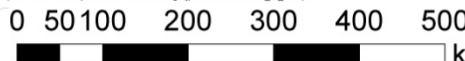
### Legend

- Assumed to be unfavorable from the viewpoint of long-term stability of the deep geological environment (orange)
- Assumed to be unfavorable from the viewpoint of risk of future inadvertent human intrusion (grey)
- Assumed to be favorable (light green)
- Assumed to be preferable also from the viewpoint of safe waste transportation (dark green)

**Reference repository size**  
 Footprint necessary for repository underground facilities is around 6-10 km<sup>2</sup>, which is illustrated by a block with a size of 3 km×3 km on this map →  
 Site necessary for surface facilities is around 1-2 km<sup>2</sup>, which is illustrated by a block with a size of 1 km×1 km on this map →



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This map is prepared on a scale of 1/2,000,000. Please note that enlarging the map beyond its original size (100%) will not result in improved detail.

Date created: July 28, 2017  
 Created by: Agency for Natural Resources and Energy, Ministry of Economy, Trade and Industry  
 Scale: 1/2,000,000 Geographic-coordinate system: JGD2011  
 Projection method: Lambert conformal conic projection (center: 135°E, 35°N) (However, each frame is rotated anticlockwise by 6°)  
 National Land Numerical Information, Administrative Zones Data 2.3rd Edition (data reference year: 2017) is used