

近年および将来の雪氷環境の変化傾向

Trends in the Snow and Ice Environment in Recent Years and in the Future

雪対策の長期的計画や施策の立案、防雪対策施設の設計に資するために、近年（1981-2010年）の降積雪や吹雪などの変化を解析し、雪氷気候値の分布図を作成しました。また、気候モデルの出力値を用いて将来の雪氷気候値を推定し、現在から将来の変化量（近未来・将来 — 現在）と地域ごとの変化傾向を調べました。

To improve the long-term planning and policy-making for snow control measures and the designing of snow-control facilities, snow depth, and snowstorms and other snowfall events in recent years (1981 - 2010) were analyzed and distribution maps of snowy-climate indicators were created. Future snowy-climate indicators were estimated by using the values output by a climate model, and the trends in the changes of the indicators for each snowy area of Japan in recent years and in the near and distant future were investigated.

近年の雪氷気候値の分布図

Distribution of snowy-climate indicators in recent years

はじめに、雪氷気候値（1冬期吹雪量や視程障害頻度）を目的変数、基本的な気象値を説明変数とする重回帰式を地域ごとに作成しました。つぎに、地域ごとの重回帰式と、気象庁のメッシュ平年値などを用いて分布図を作成しました。

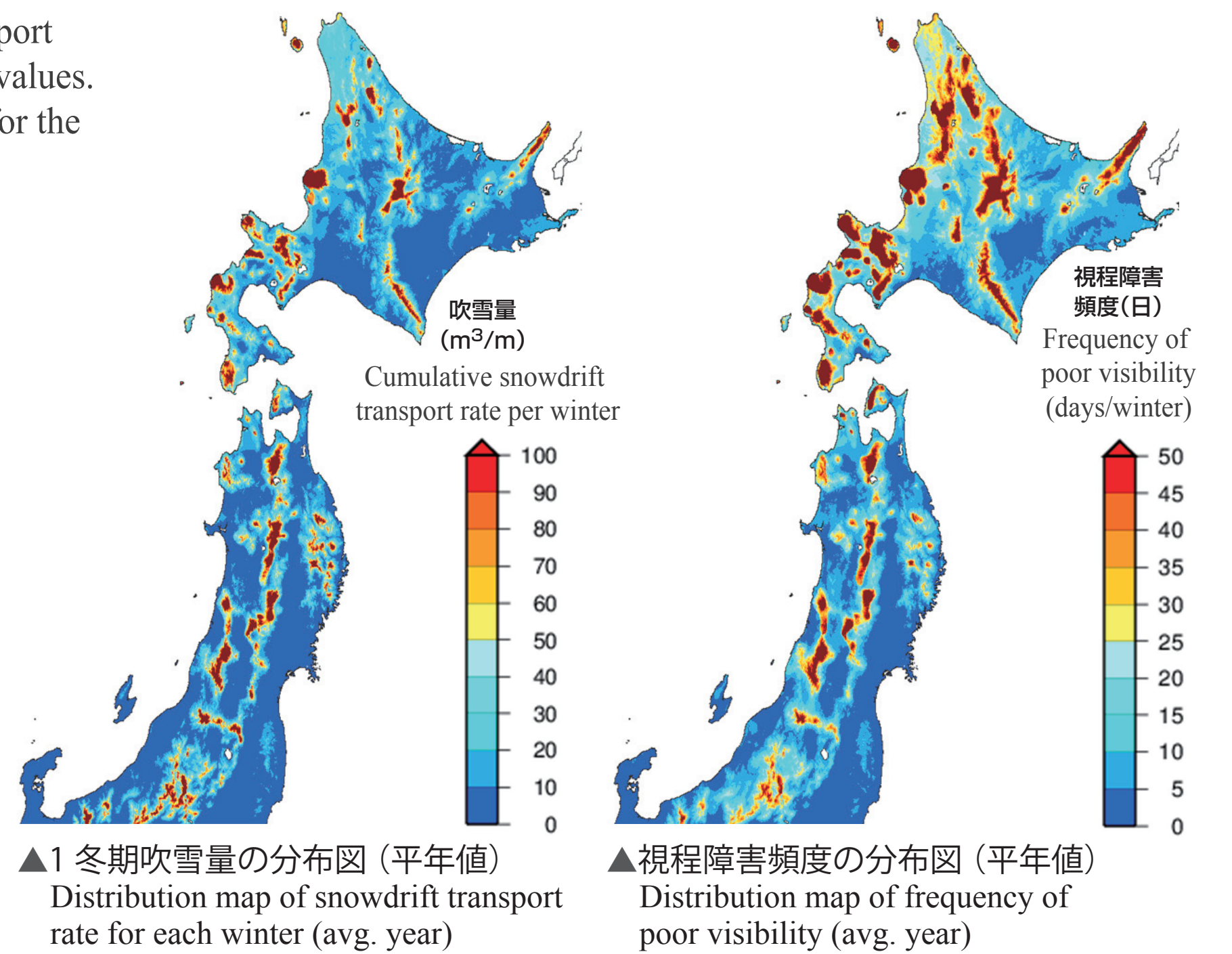
First, a multiple regression equation was created whose objective variables were the cumulative snowdrift transport rate and the frequency of poor visibility per winter and whose explanatory variables were basic meteorological values. Next, a distribution map for each area was created using a multiple-regression equation and mesh climate data for the average year published by the Japan Meteorological Agency.

雪氷気候値の概要 Outline of the snowy-climate indicators

雪氷気候値 Snowy-climate indicators	概 要 Outline
1冬期吹雪量 (m^3/m) Cumulative snowdrift transport rate per winter	単位時間に風向と直角な単位幅を通過する雪の体積を吹雪量といい、その吹雪量の年間総計を1冬期吹雪量と定義します。 Snowdrift transport rate is defined as the mass of snow that passes a unit width perpendicular to the wind direction per unit time. The seasonal total of snowdrift transport rate is defined as the cumulative snowdrift transport rate per winter.
視程障害頻度 (日) Frequency of poor visibility (days/winter)	1年間のうち視程障害が発生する日数です。ここでは視程200mを下回る日を視程障害発生日とし、その年間総計を視程障害発生頻度と定義します。 The number of days per winter on which poor visibility occurs. Poor visibility is defined as visibility less than 200 m. The number of days with poor visibility occurrence in a winter is defined as the frequency of poor visibility.

注：雪氷気候値は気象条件（気温、風速、積雪深）から推定した値です。

Note: The snowy-climate indicators were estimated based on weather information (i.e., air temperature, wind velocity and snow depth).



▲ 1冬期吹雪量の分布図（平年値）
Distribution map of snowdrift transport rate for each winter (avg. year)

▲ 視程障害頻度の分布図（平年値）
Distribution map of frequency of poor visibility (avg. year)

将来の雪氷環境の変化傾向

Trends of changes in seasonal snowfall in the future

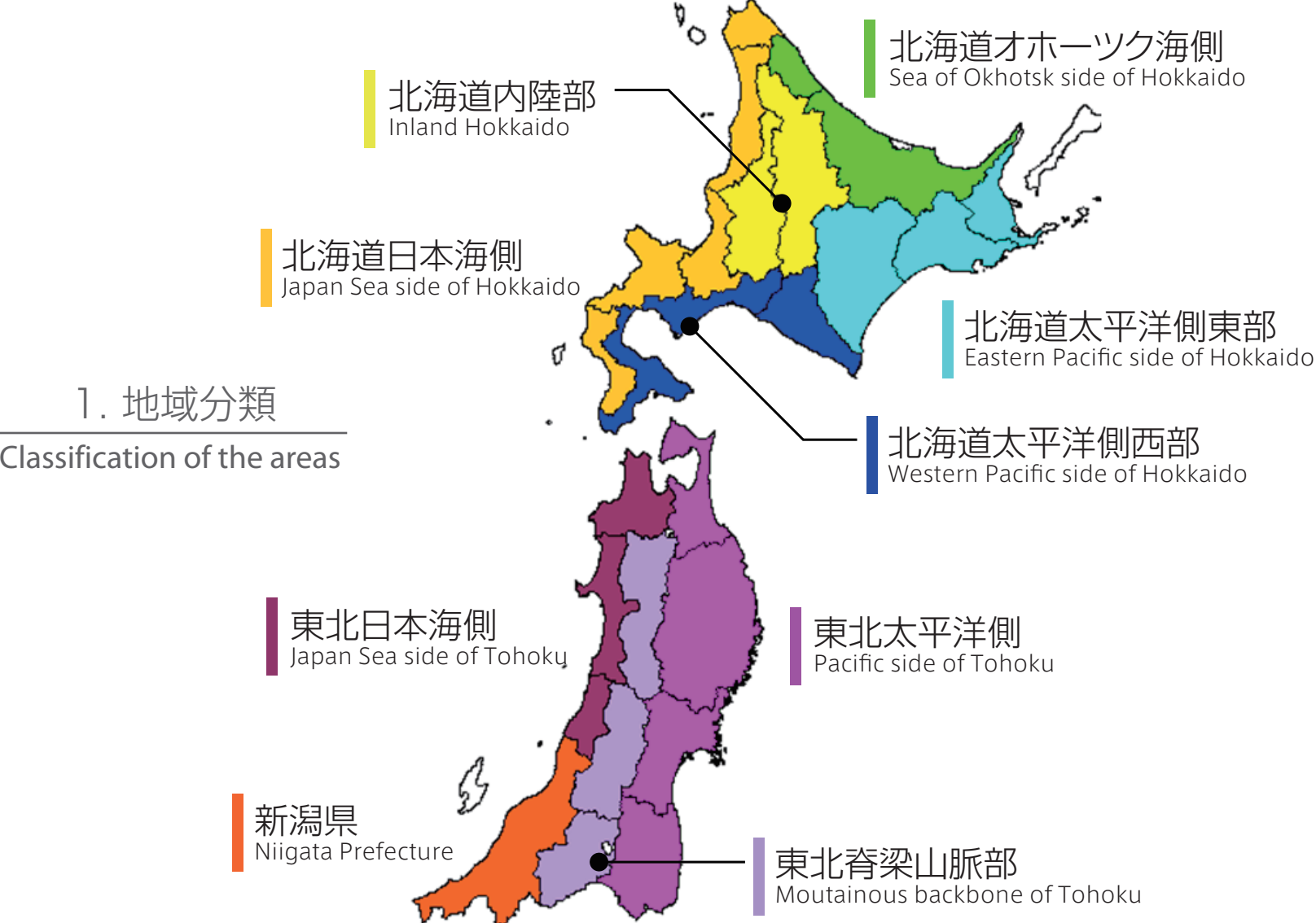
1冬期吹雪量の平均値は、近未来から将来にかけて全体として減少傾向でした。また、24時間最大降雪量は、平均値が北海道内陸部やオホーツク海側で、最大値については北海道の日本海側、内陸部、太平洋側西部でそれぞれ増加する傾向が見られました。

The average values of the cumulative snowdrift transport rate per winter will tend to decrease in the near and distant future.

The average maximum snowfall for 24 hours will tend to increase in inland areas and on the Okhotsk side of Hokkaido, and the largest value of maximum snowfall for 24 hours will tend to increase on the Japan Sea side, inland and on the Western Pacific side of Hokkaido.

雪氷気候値の地域ごとの変化傾向

Trends in changes in the snowy-climate indicators in each area



1. 地域分類 Classification of the areas

2. 変化傾向 Trends of changes

