

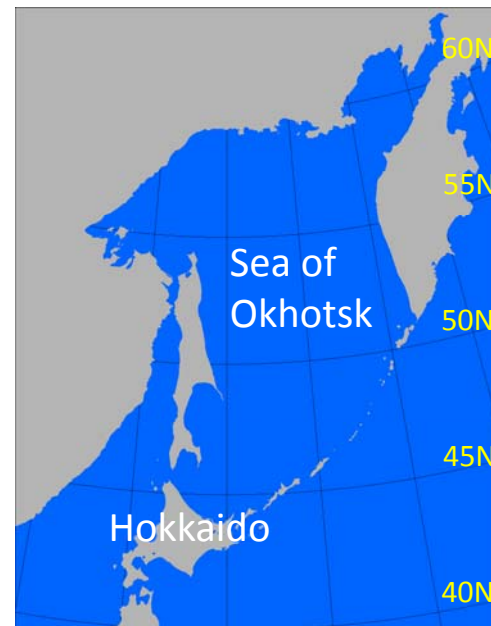
# **RGB FIGURES FOR SEA ICE MONITORING**

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# Sea Ice Information for the Sea of Okhotsk

- The Sea of Okhotsk is the southernmost sea in the Northern Hemisphere where sea ice is observed across a wide area
- JMA issues Sea Ice Information for the Sea of Okhotsk for
  - Shipping Safety
  - Fishery Activities
  - Port Management and Coastal Disaster Prevention
  - Tourism
  - Climate Monitoring



St. Petersburg, Oslo (~60N)

Copenhagen (~55N)

London (~51N)  
Vancouver (~49N)

Prince Edward Is. (~46N)

New York (~41N)

For reference,  
Christchurch (New Zealand) (~43S),  
Cape Horn (Chile) (~56S)

Sea ices come to the coast of Hokkaido  
every year!

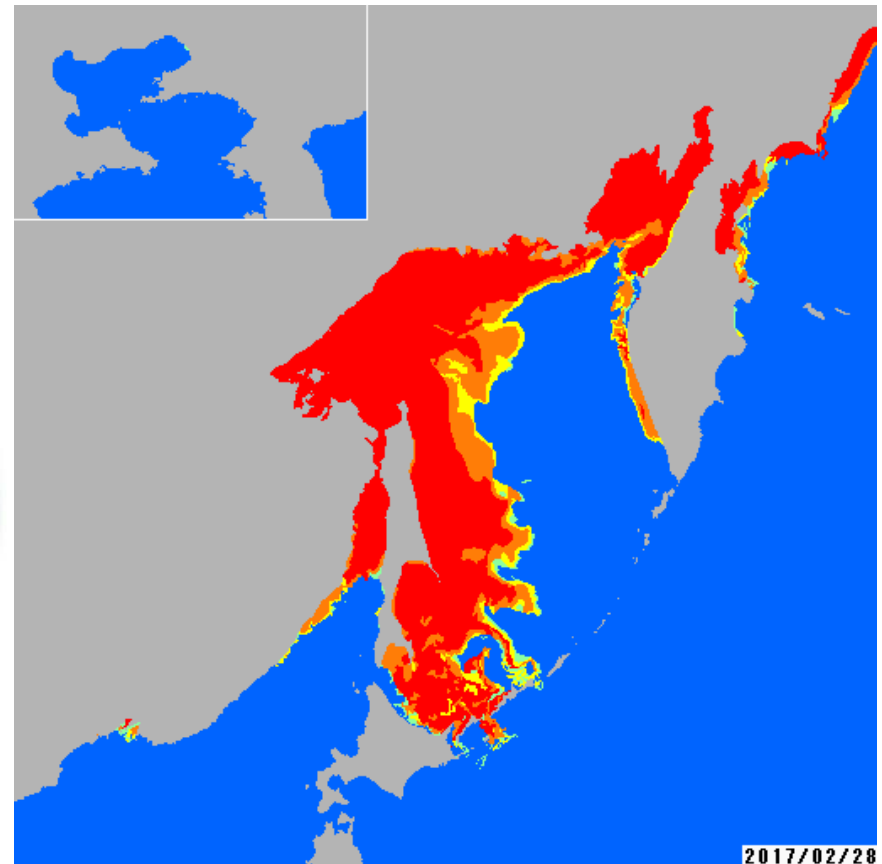
# Sea Ice Analysis Chart

- JMA staffs draw charts based on observation data. In drawing, RGB figures are very useful.

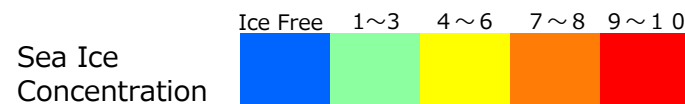
Observations  
(Satellites, Aircrafts,  
Vessels and Ships,  
Visual obs. from  
coastal stations)



- In addition, last year, we started to refer to automatic sea ice analysis results from HIMAWARI data.
  - Based on characteristics of sea ice in multiple sensors (similar to the idea of RGB products)



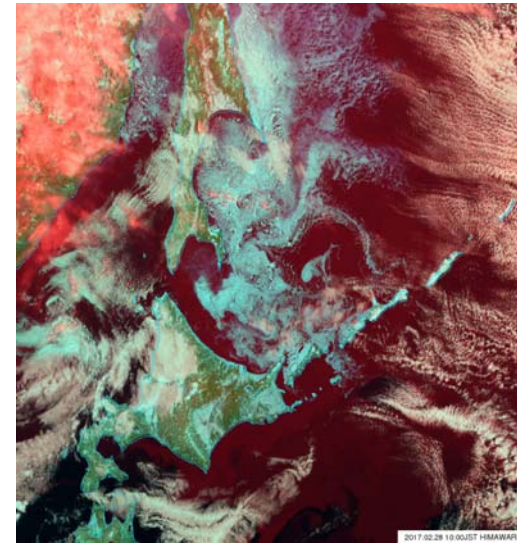
Sea Ice Analysis Chart



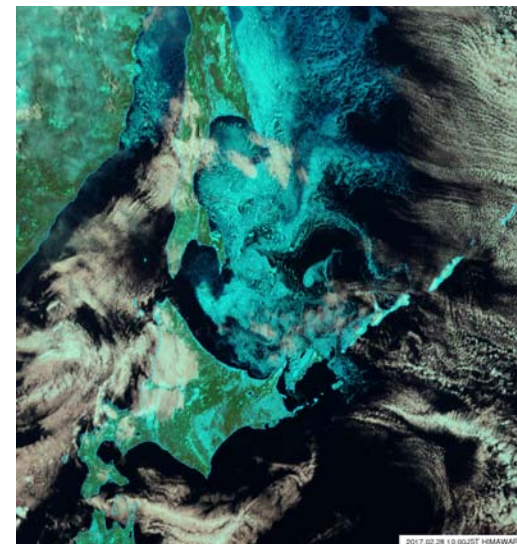
# RGB Figures for Sea Ice Analysis (1)

- Sea Ice has characteristics
  - Higher temperature compared with clouds (lower IR radiation)
  - Lower reflectance compared with water clouds in NIR
  - High reflectance in VIS
- Two types of RGB Figures from HIMAWARI-8 are used for sea ice analysis in JMA
  - A) R: Band 13 (IR), G: Band 4 (NIR), B: Band 3 (VIS)
  - B) R: Band 5 (NIR), G: Band 4 (NIR), B: Band 3 (VIS)
- Type A figures are also available as well as Sea Ice Analysis charts in JMA website (Japanese site only)

Type A

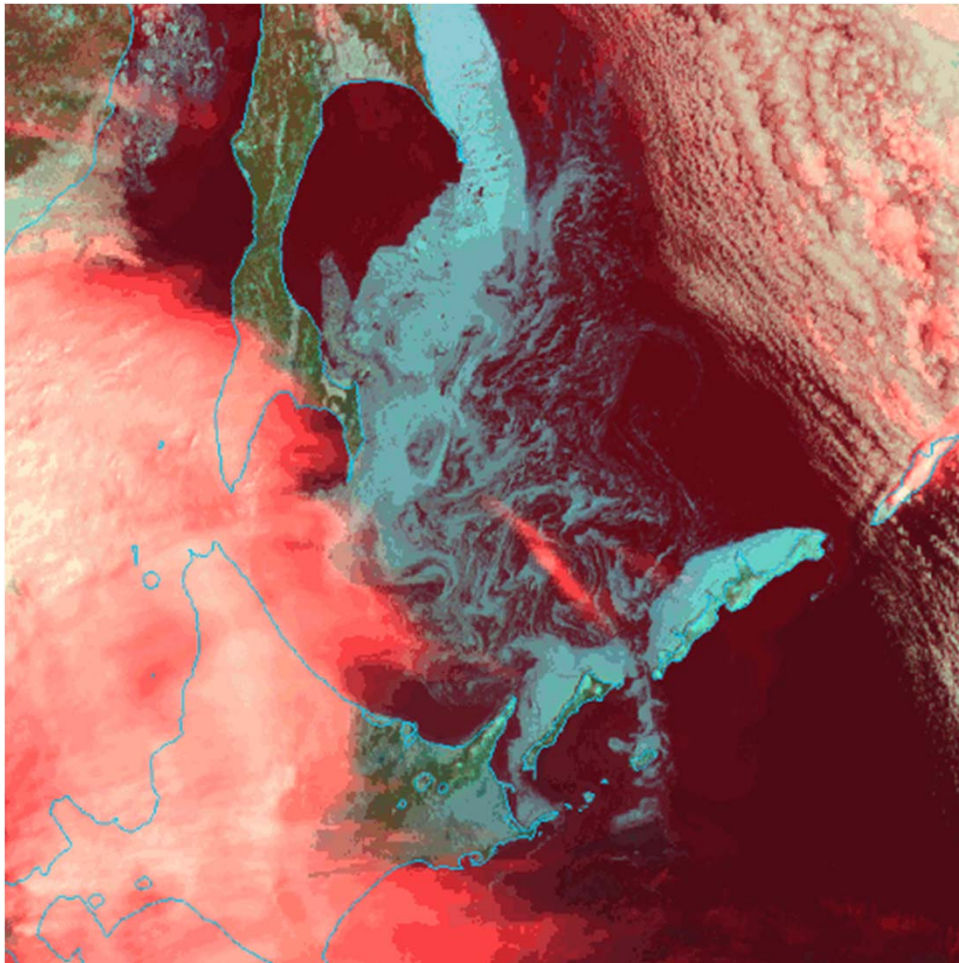


Type B



2017/02/28 10:00JST

# RGB Figures for Sea Ice Analysis (2)



RGB Figures Animation  
(2017/03/21 09:00 – 16:00 JST)

R13B04G03 (Type A)  
R05G04B03 (Type B)  
R03G02B01 (Reference)

# Usage of RGB Figures for Sea Ice Information for the Sea of Okhotsk

- JMA provides RGB figures from website.
- JMA uses RGB figures in drawing Sea Ice Analysis Charts.
- Usefulness
  - Sea ices are identified easily, by color and their moves (10 min interval observations of Himawari!).
- Difficulties (due to the characteristic of the Sea of Okhotsk, not due to RGB figures)
  - Sea ices cannot be seen when clouds cover the area. Unfortunately, clouds often cover the area in winter.
  - The duration of daylight is short especially in the northern part of the sea.