

- 3) Use the annexed surface analysis chart (**Map No: 2**) and sea state chart (**Map No: 3**) for North Atlantic to answer following questions.

A vessel sailing from Europe to East coast of United States is currently in a position of $40^{\circ}00'N$, $050^{\circ}00'W$.

- a) Write down the current weather, including the (most frequent) probable wave height, the vessel is experiencing. (10 marks)
- b) What is the maximum wave height the vessel is likely to encounter at that position. (05 marks)
- c) If the vessel is steering a course of WSW, state what changes in weather that you would expect. (05 marks)
- d) In the given map mark the areas of good weather. (05 marks)
- e) Mark the area of highest wind speed in the storm centered near $47^{\circ}00'N$, $054^{\circ}00'W$ (977mb) (05 marks)
- f) Briefly describe
- i. Significant Wave Height
 - i. Most Frequent (Probable) Wave Height
 - ii. Maximum wave height
- (05 marks each)

- 4) To answer this question, use 72 hr Surface Prognosis chart (**Map No: 4**) and 72hr 500mb Chart (**Map No: 5**).

- a) Identify and mark all ridges and troughs in the 500mb chart. (05 marks)
- b) Explain the significance of the 5640m height contour in the 500mb chart. (05 marks)
- c) A developing low pressure (1016mb) system is shown at $45^{\circ}00'N$, $075^{\circ}00'W$ on 72 hr surface prognosis chart. Using the 500mb chart, predict whether the low pressure system will deepen in to a storm. (05 marks)
- d) What is the likely movement (direction and speed) of low pressure system stated in (c) above. (05 marks)

5)

a) Describe following terms:

- i. Frazil Ice
- ii. Pack ice
- iii. Fast Ice
- iv. Ice Blink
- v. First year ice

(02 marks each)

b) Using the Ice Analysis chart (**Map No:6**) state the ice condition a vessel would encounter at position 50°00' N, 050° 00' W when approaching New Foundland.

(15 marks)

c) As per the Iceberg analysis chart (**Map no:7**), state the number of icebergs present below 55°N parallel in the North Atlantic Ocean.

(02 marks)

d) What are the ice limits in Northern and Southern Hemisphere?

(08 marks)

6) Briefly describe following routes used in Optimum Routing:

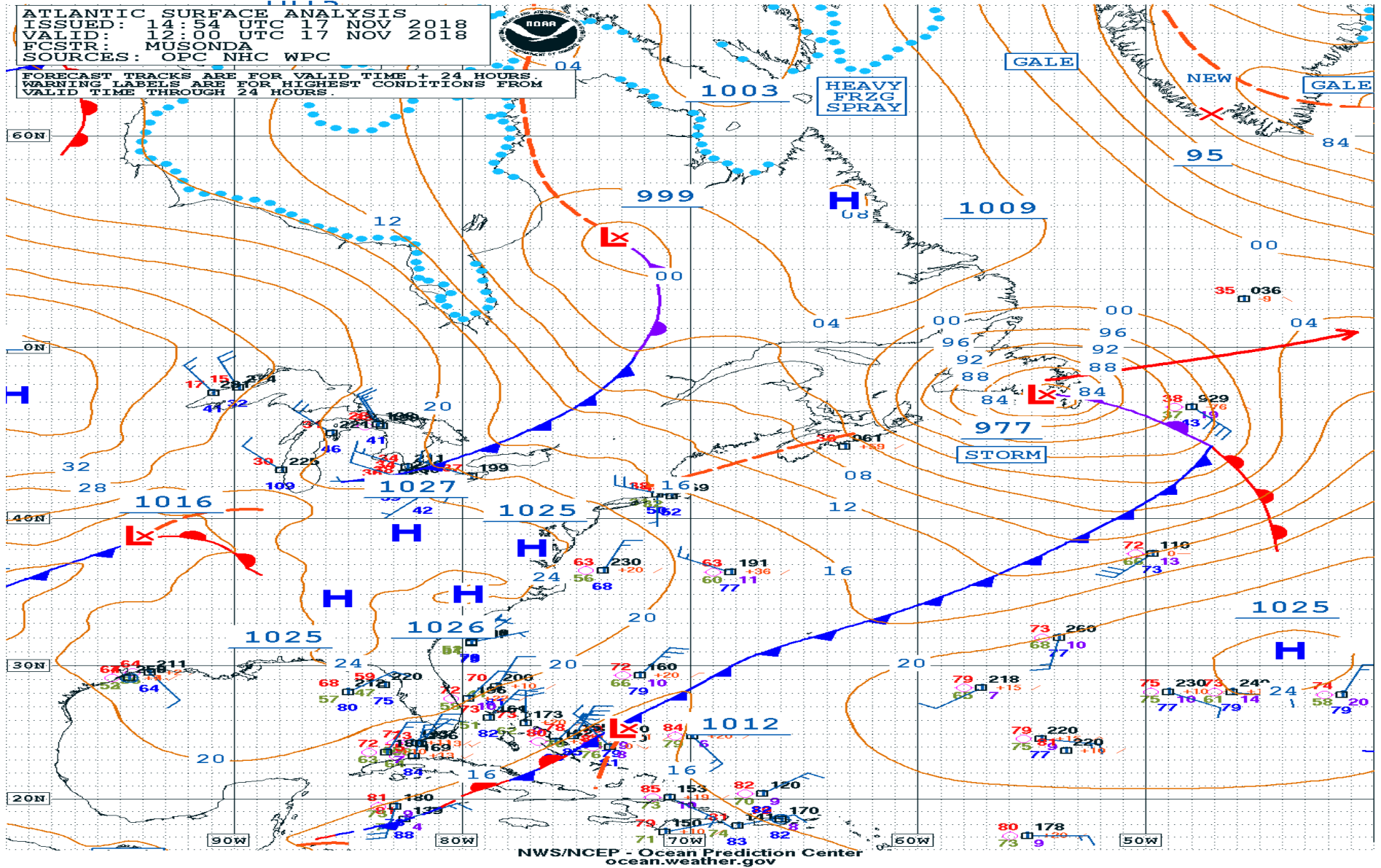
- a) Least time
- b) Least time with least damage
- c) Least damage
- d) Constant Speed

(05 marks each)

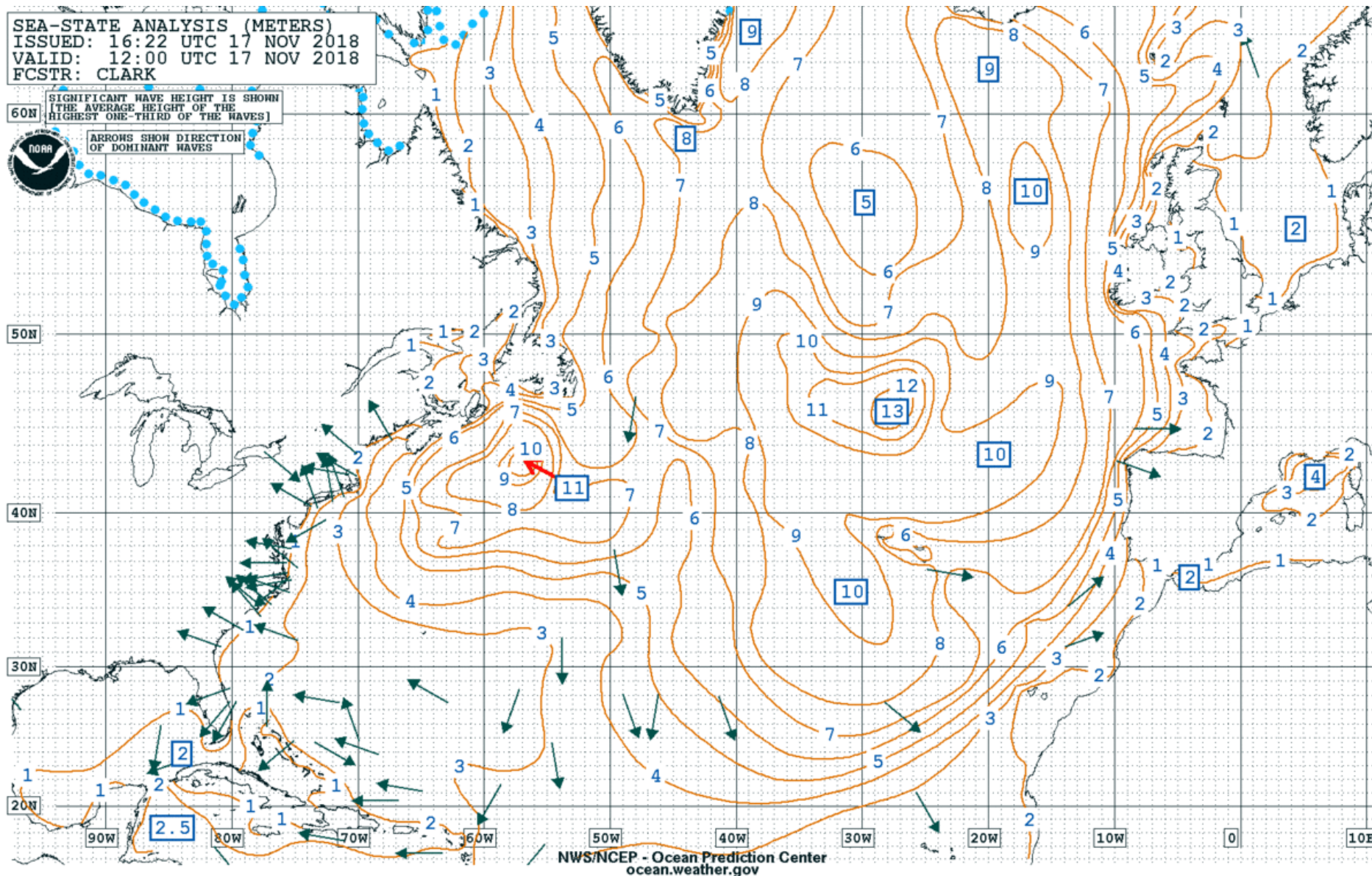
MAP 1: North Atlantic Ocean (Blank)



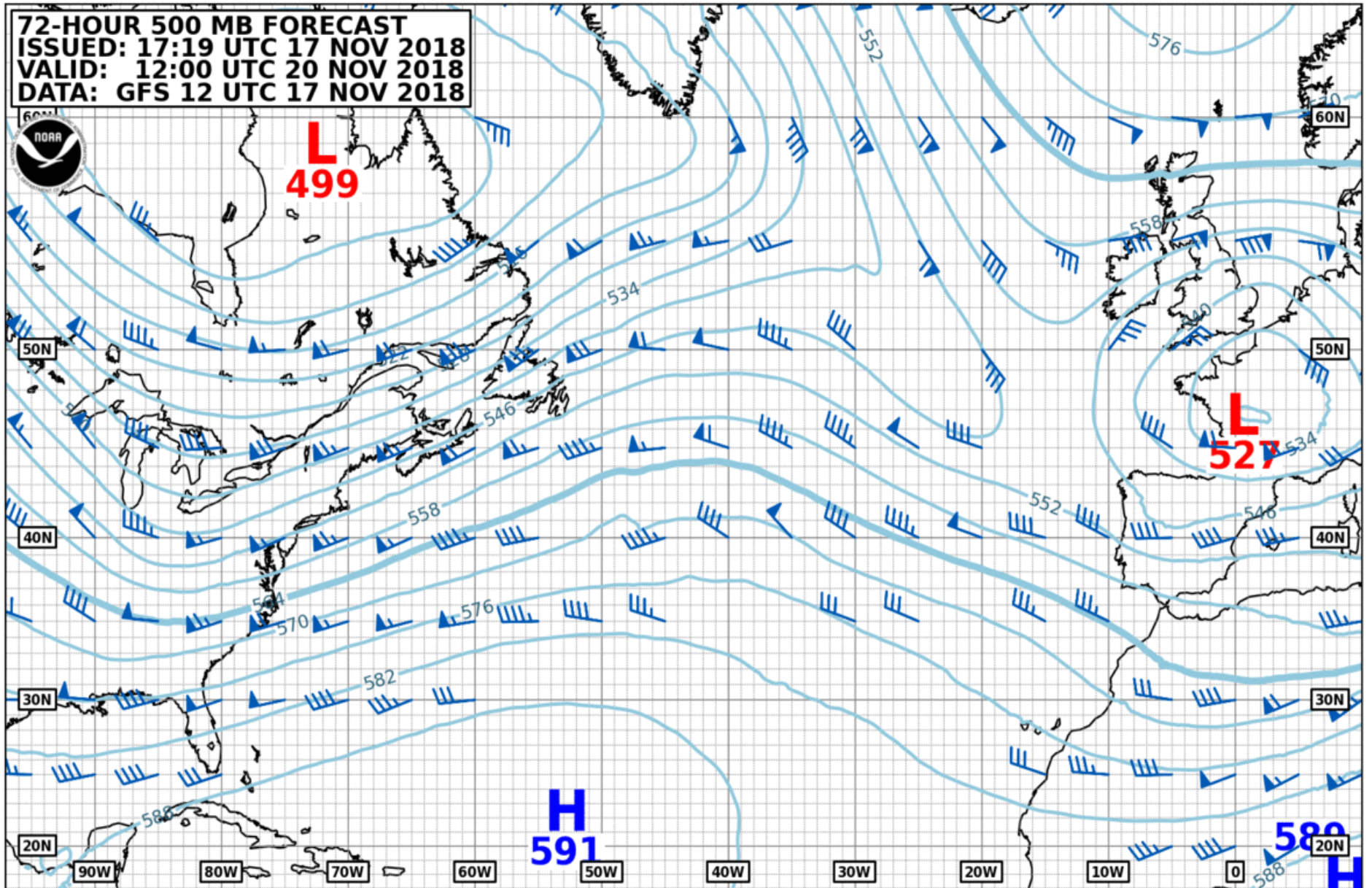
MAP 2: Surface Analysis



Map 3: Sea State Analysis

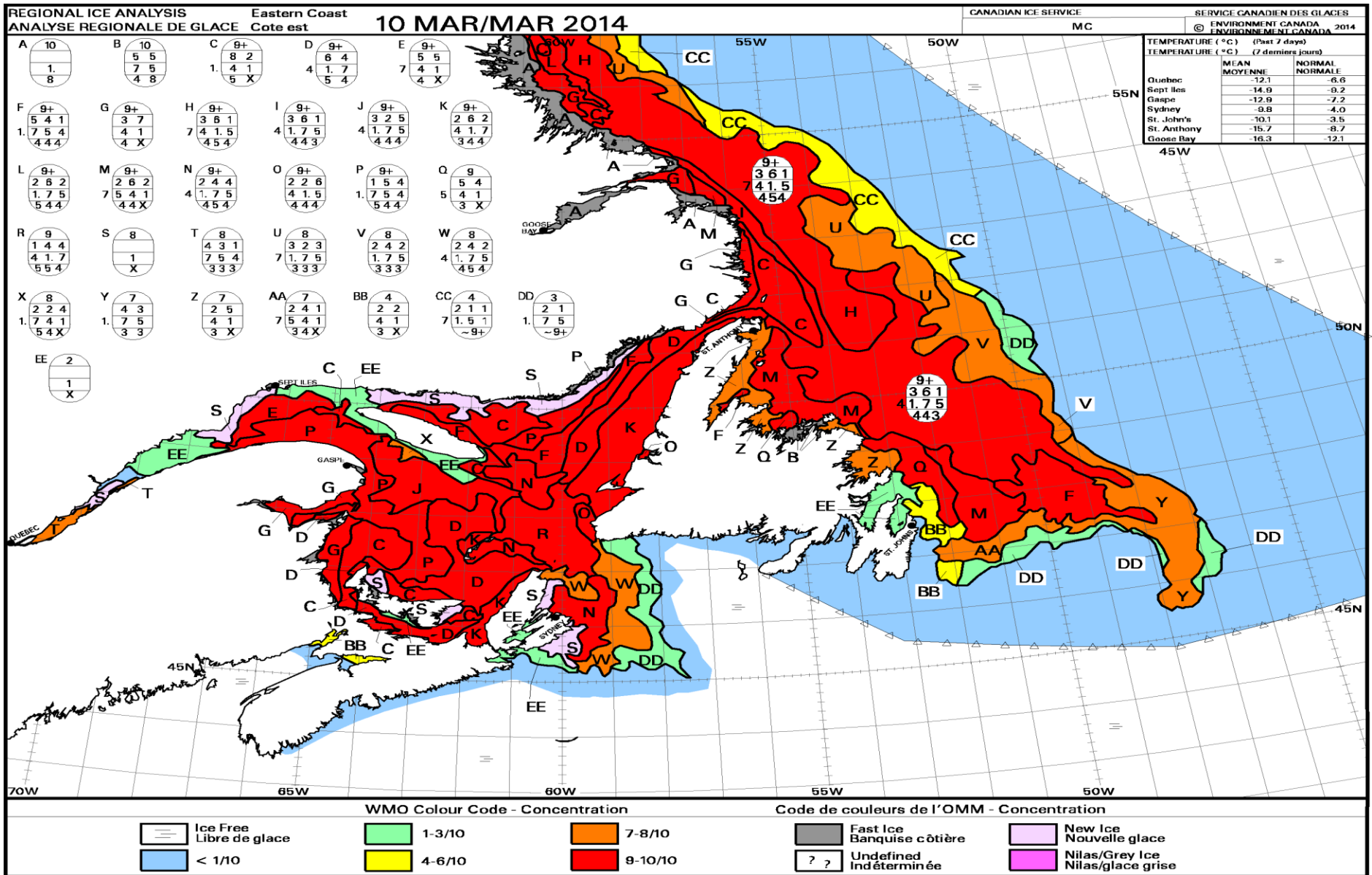


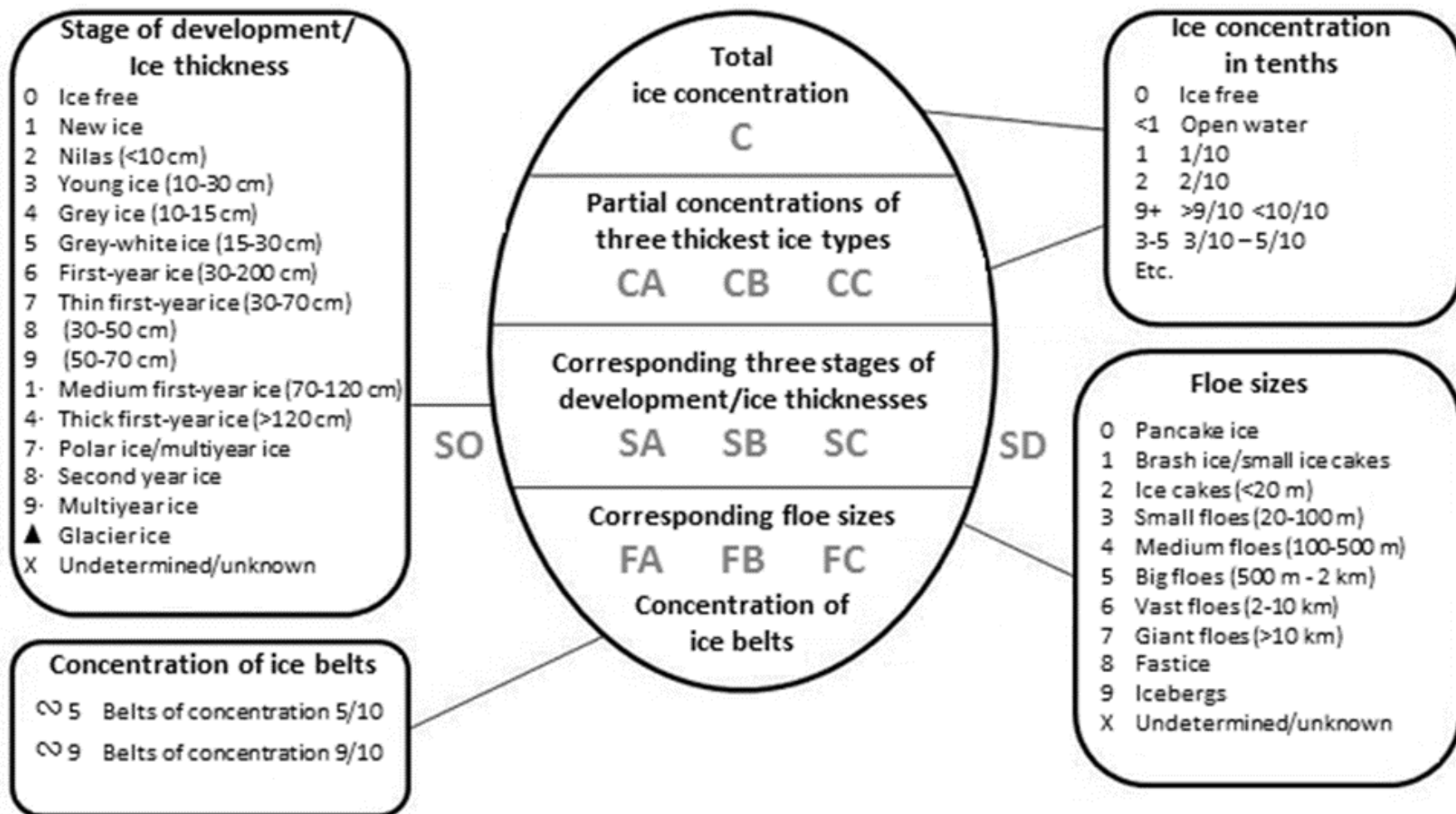
MAP 5: 72- Hour 500MB Forecast



NWS/NCEP - Ocean Prediction Center
<https://ocean.weather.gov>

MAP 6: Ice Analysis and Egg Code





The ice egg may be supplemented by 2 figures:

SO Sporadic (<1/10 concentration) occurrences of ice, thicker than indicated inside the egg, may be indicated here.

SO When all partial ice concentrations inside the egg total considerably less than the total ice concentration C, the stage of development of the predominant of the remaining thinner ice types may be indicated here.

MAP 7: Iceberg Analysis

