

Mapping the Arctic: An Introduction to Arctic Issues

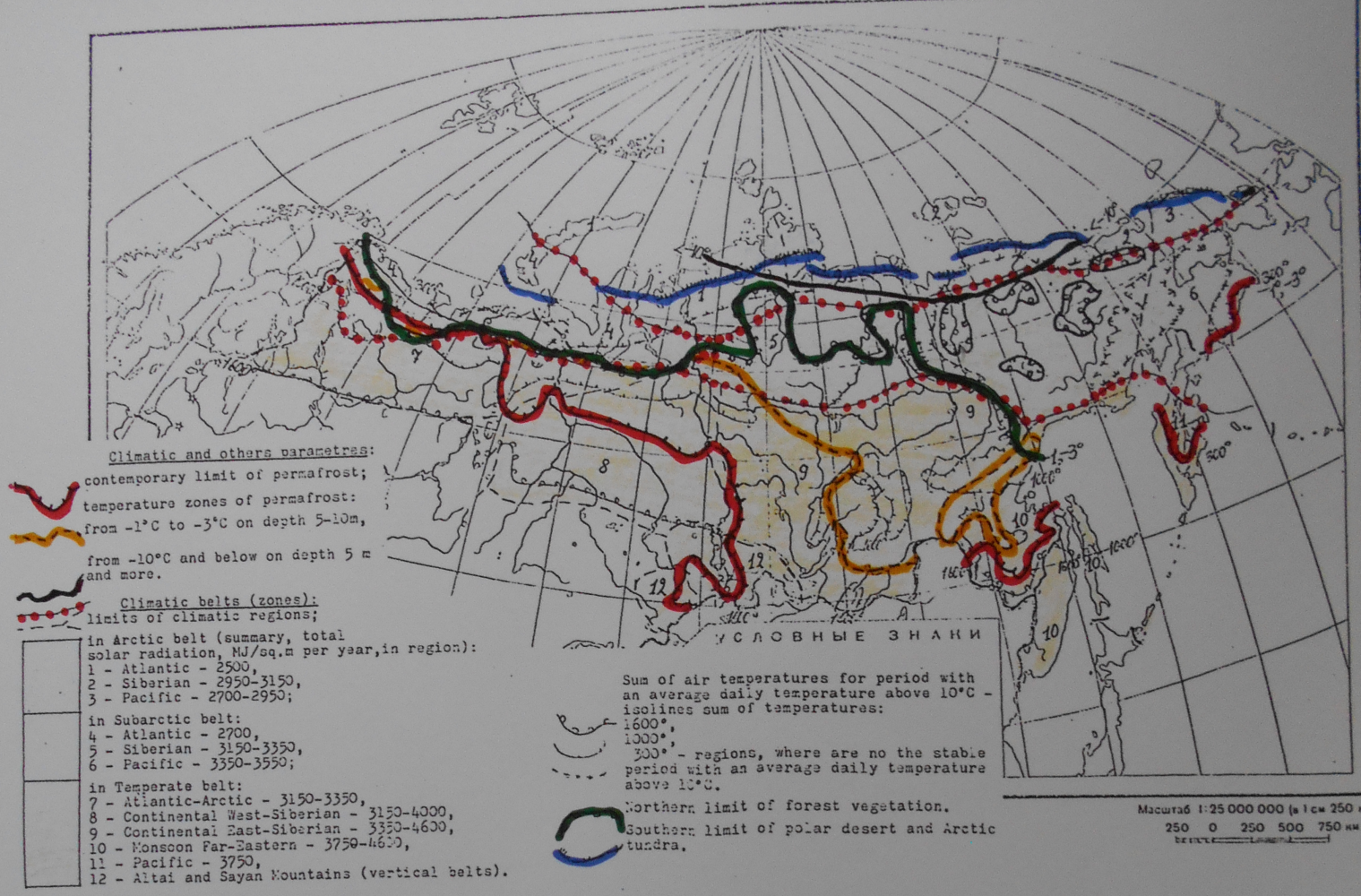
Изотерма июля +10 градусов С как южная граница Арктики.

Labeled Circumpolar Map

Северная граница распространения лесов



Физико-географические границы Российского Севера



Современная граница многолетней мерзлоты, температура зоны мерзлоты: от -1°C до -3°C на глубине 5-10 метров; от -10°C и ниже на глубине 5 метров и более

Границы климатических зон (поясов), Солнечная радиация, МДж/кв. м в год.
 Арктический пояс: 1. Атлантический регион – 2500, 2. Сибирский регион – 2950-3150.
 3. Тихоокеанский регион – 2700-2950. Субарктический пояс: 4. Атлантический регион – 2700. 5. Сибирский регион – 3150-3350. 6. Тихоокеанский регион – 3350-3550.

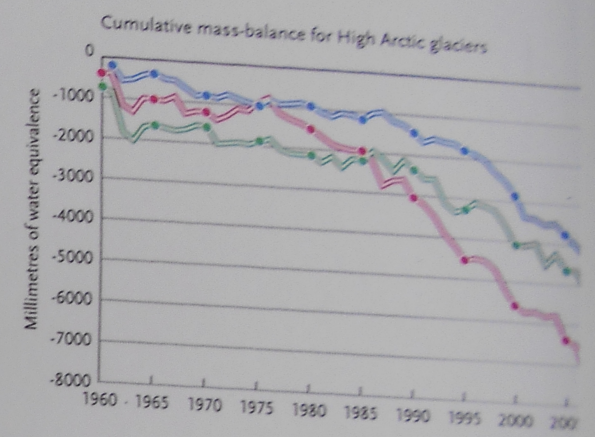
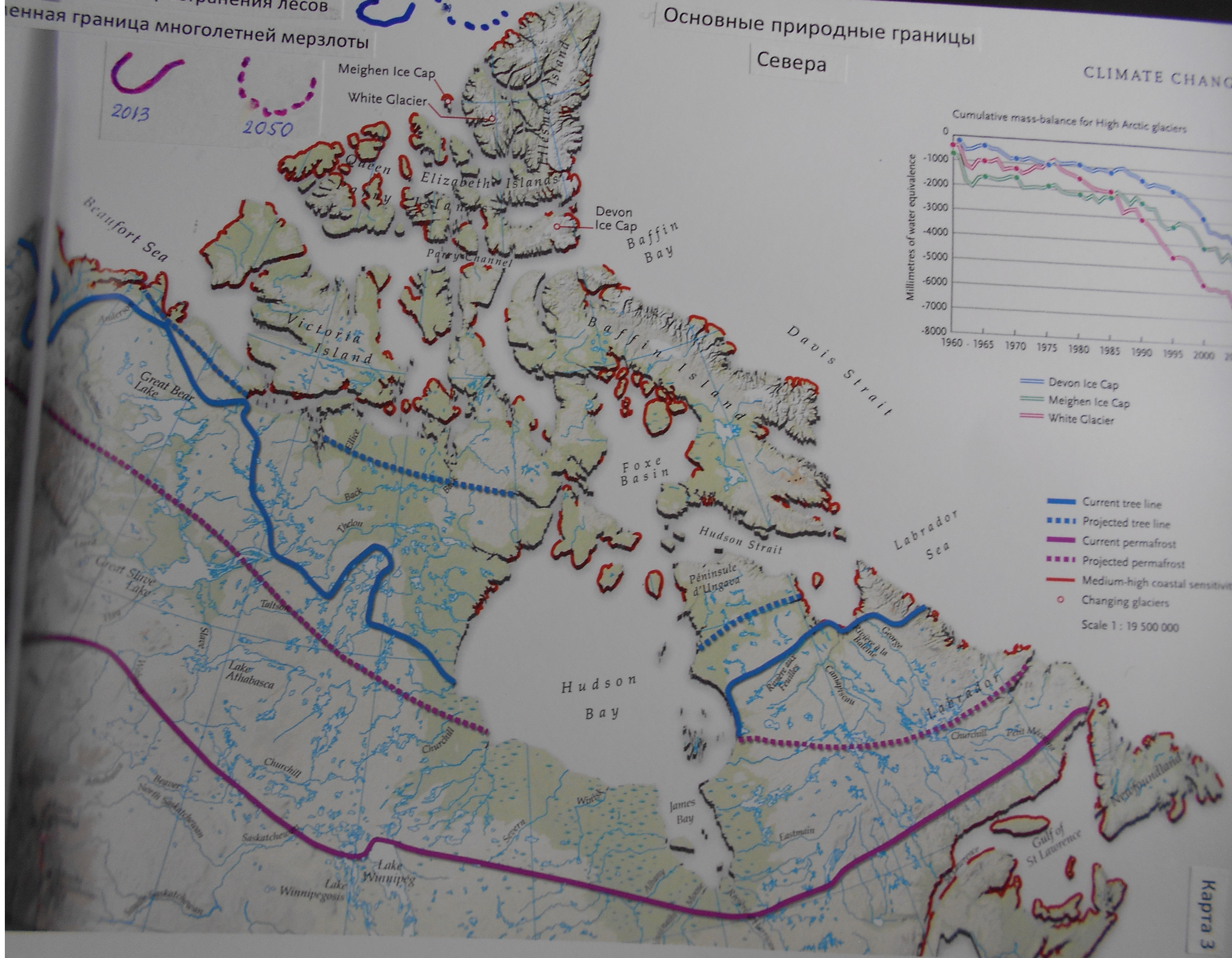
Сумма температур воздуха за период со средней июльской температурой выше 10°C
 изолинии суммарных температур 1600°, 1000°, 300°; регионы с нестабильным периодом температур выше 10°C. Северная граница лесной растительности
 Южная граница полярной пустыни и арктическая тундра

Основная граница многолетней мерзлоты

Основные природные границы Севера

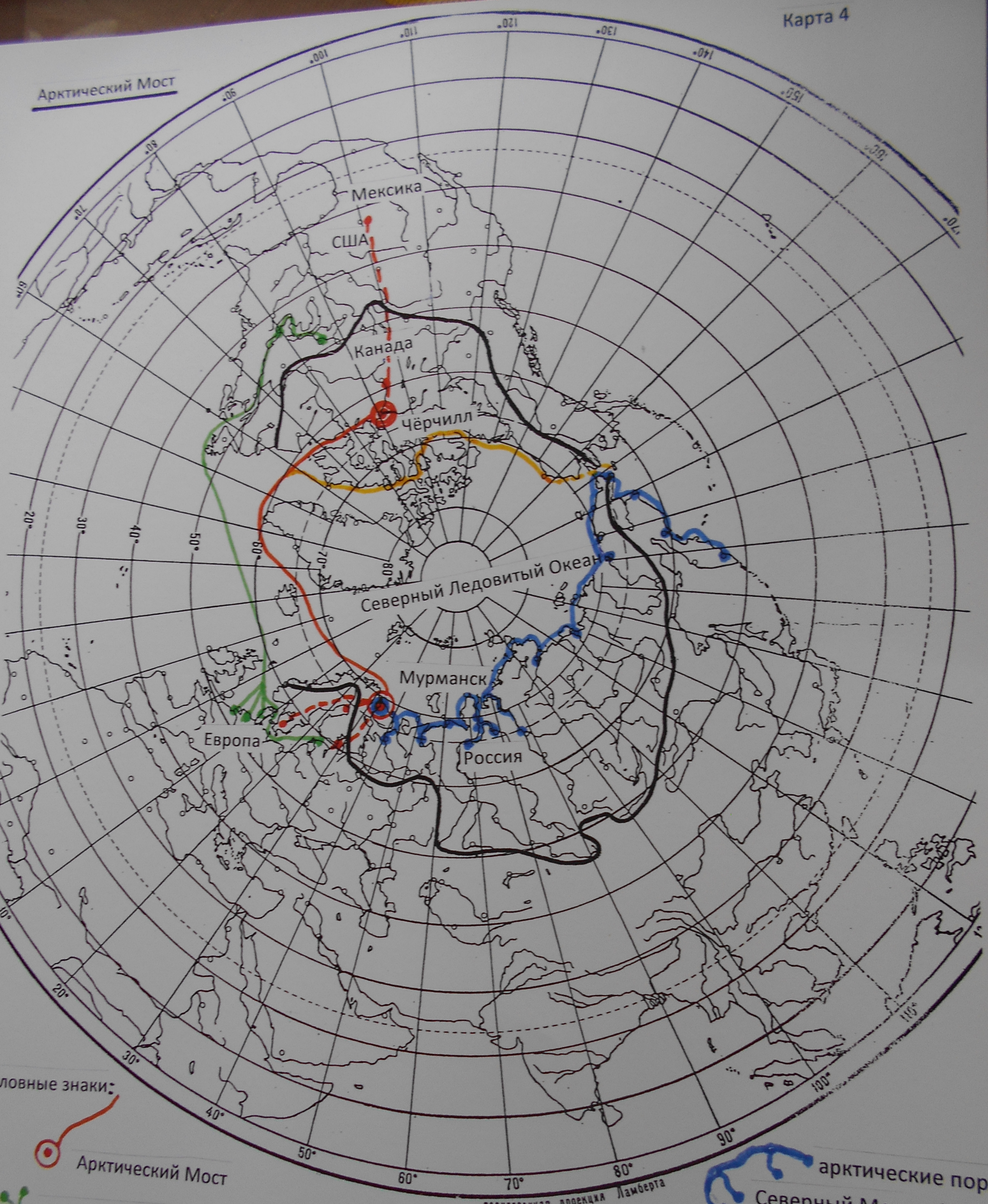
CLIMATE CHANGE

2013
2050



- Devon Ice Cap
 - Meighen Ice Cap
 - White Glacier
 - Current tree line
 - Projected tree line
 - Current permafrost
 - Projected permafrost
 - Medium-high coastal sensitivity
 - Changing glaciers
- Scale 1 : 19 500 000

Арктический Мост



Основные знаки:

Арктический Мост

традиционные грузопотоки: Европа - Канада

равновесная проекция Ламберта

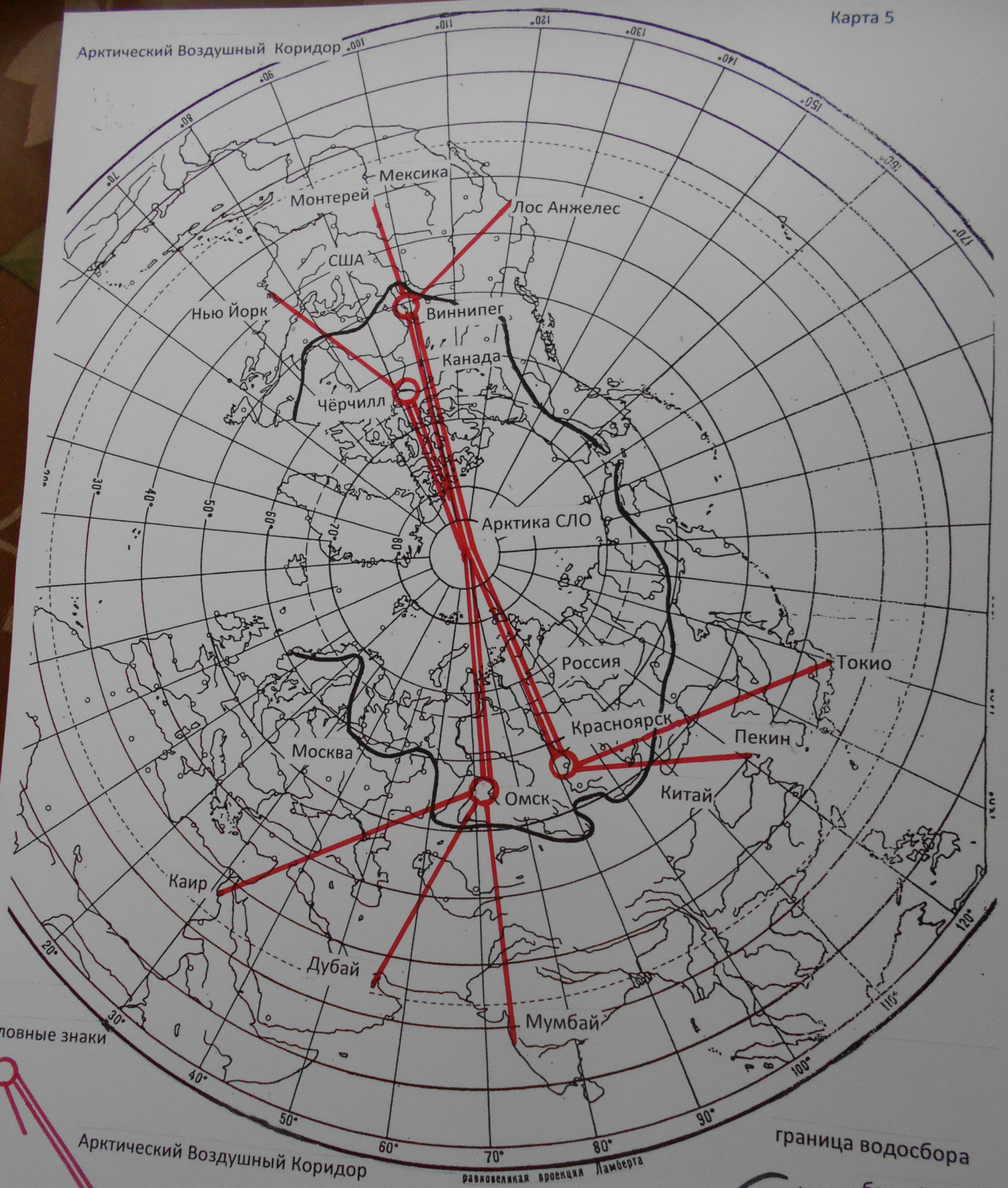
Северный Морской Путь

граница водосбора бассейна СЛО

Северо-Западный Проход

Масштаб 1:75 000 000

Арктический Воздушный Коридор



Условные знаки



Арктический Воздушный Коридор

равноугольная проекция Ламберта

граница водосбора

бассейна СЛО

Масштаб 1:75 000 000

План города Виннипег. В северо-западной части международный аэропорт, построенный в 2009 г.

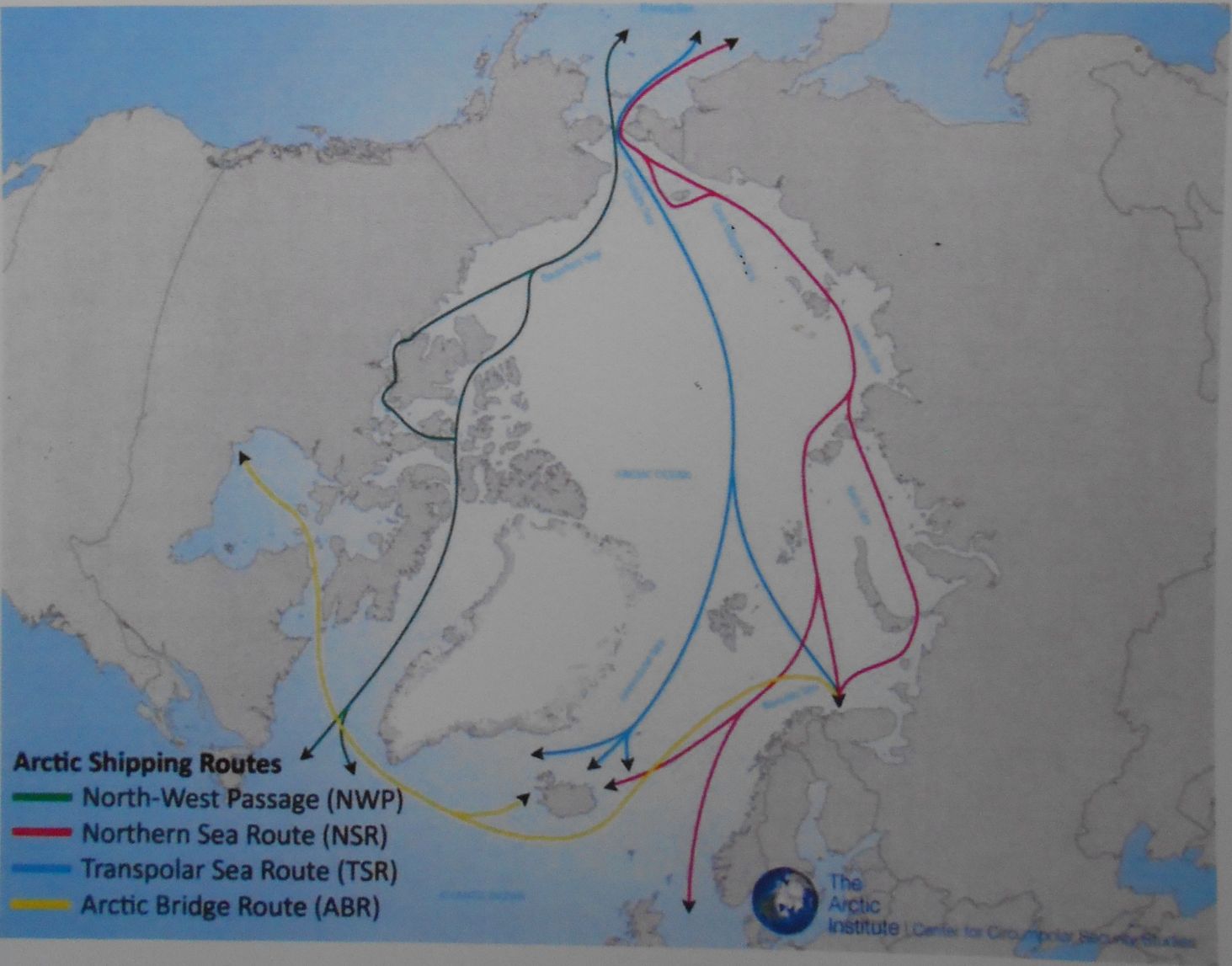


Карта

Mapping the Arctic: An Introduction to Arctic Issues

Potential New Shipping Routes

Картографирование Арктики. Введение в изучение Арктики. Потенциальные новые маршруты: Северо-Западный проход; Северный Морской Путь; Трансполярный Морской Путь; Арктический Мост.



Арктическое Кольцо



Железные дороги

Северный Морской Путь

Речные пути

Continental Claims



North Pole
Russia leaves its flag on the seabed in 2008, 4,000 meters beneath the surface, as part of its claims for oil and gas reserves.

Lomonosov Ridge
Russia argues that this underwater feature is an extension of its continental territory.

EEZ boundary
200-nautical mile (370 kilometers) line shows how far countries' agreed economic area extends beyond their coastline. This is often set from outlying islands.

Potential continental shelf claims
Countries can claim up to 350 nautical miles (403 miles, 638 kilometers) if the area proves to be a direct extension of the continental shelf.

Russian-claimed territory
Area disputed by Russia and Norway

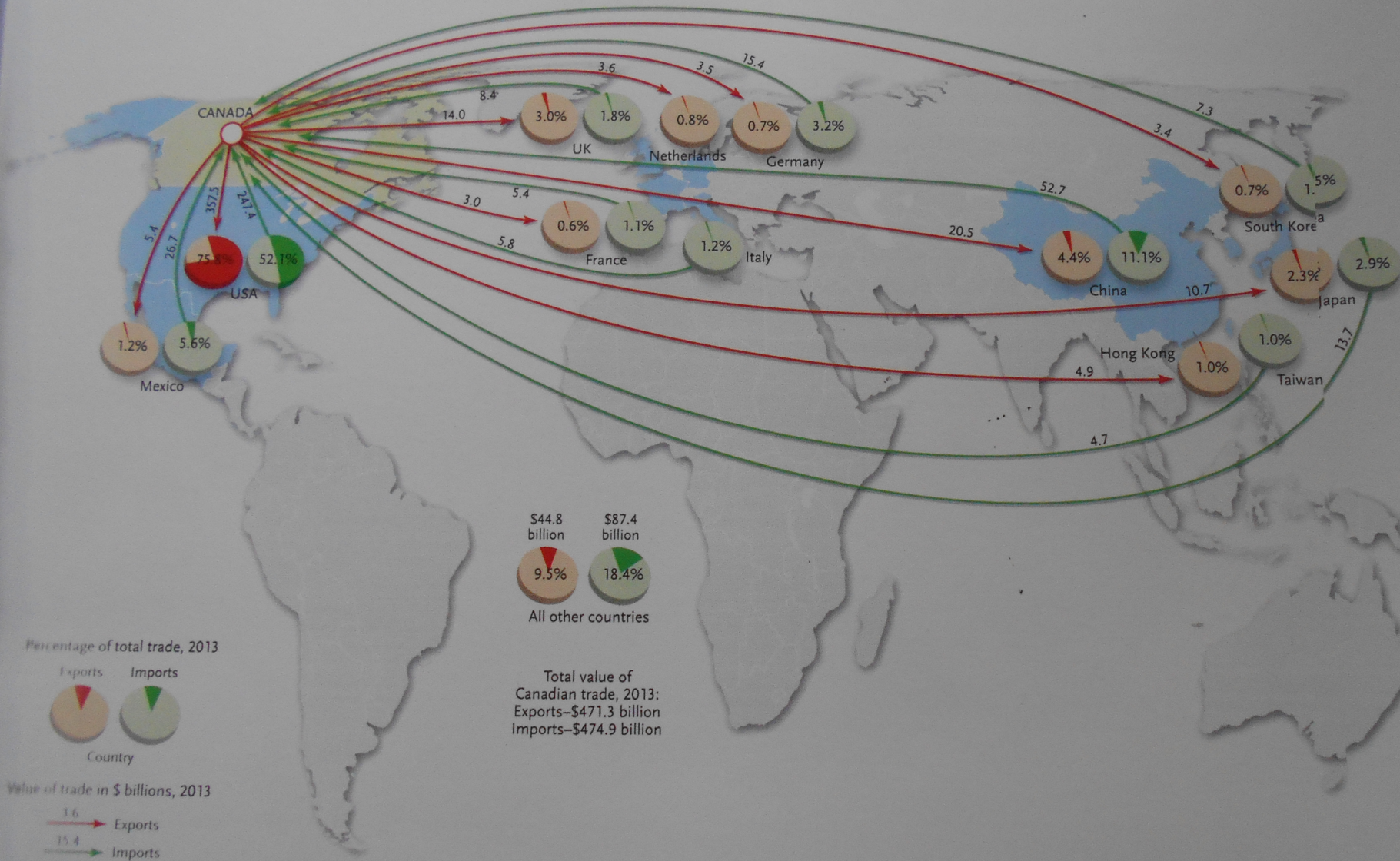
New claim
Russia claims it has geological evidence to prove that this vast area, which stretches all the way to the North Pole, is part of its continental structure.

London to Tokyo (via Northeast Passage)
13,000 kilometers

New York City to Tokyo (via Northwest Passage)
14,000 kilometers

- London to Tokyo via Northeast Passage
13,000 kilometers
- London to Tokyo via Suez Canal
20,900 kilometers
- New York City to Tokyo via Northwest Passage
14,000 kilometers
- New York City to Tokyo via Panama Canal
18,200 kilometers

TOP 10 COUNTRIES FOR EXPORTS AND IMPORTS, 2013



традиционные пути перевозки грузов, традиционные маршруты грузопотоков между Европой и Канадским Западом, традиционные грузопотоки: Европа – Канада Мексика США

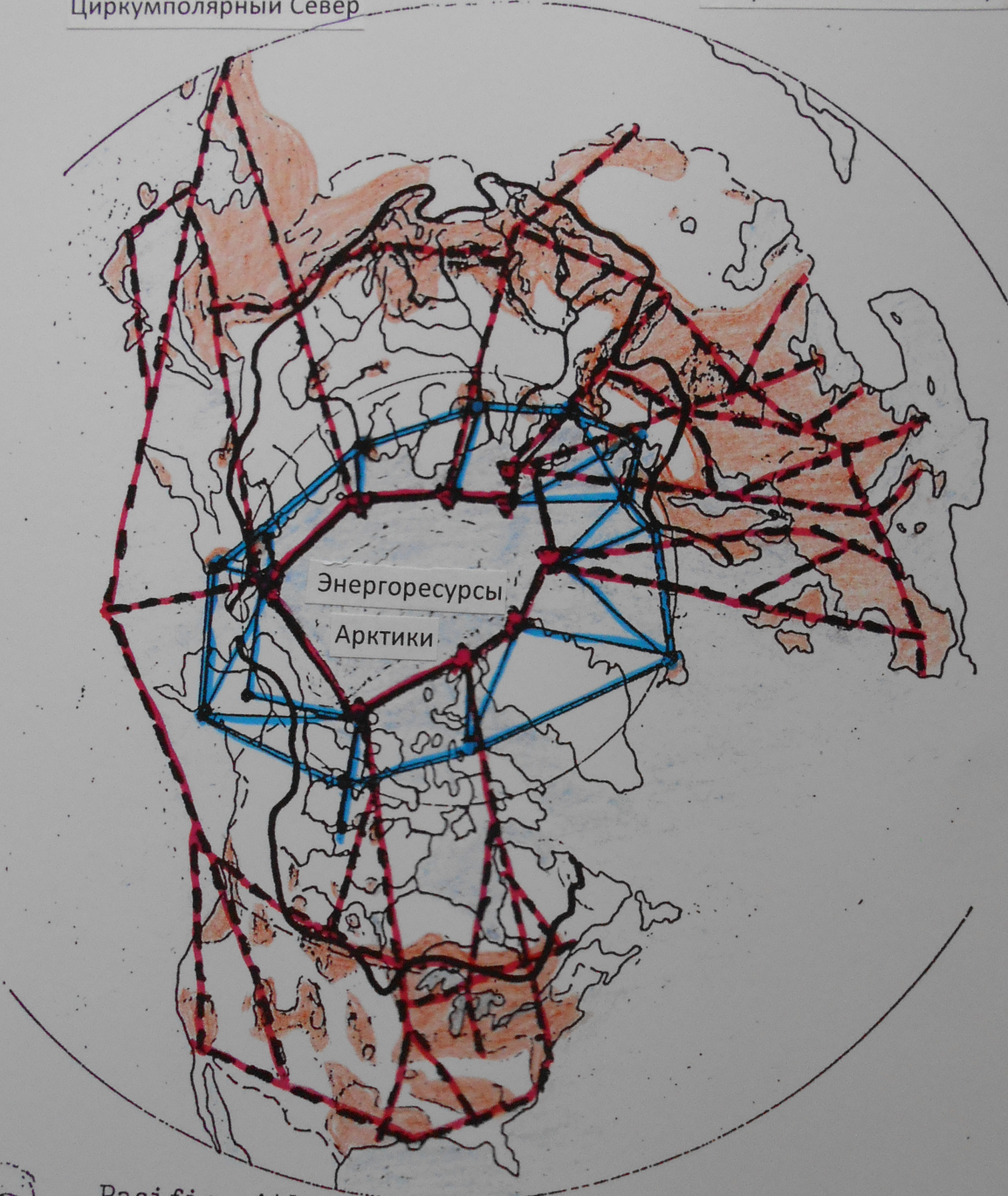
Карта








Циркумполярный Север. Система ядерных (атомных) электростанций и потребители энергии.

CIRCUMPOLAR NORTH: NUCLEAR POWER SYSTEM AND CONSUMERS

Полярная проекция
Циркумполярный Север

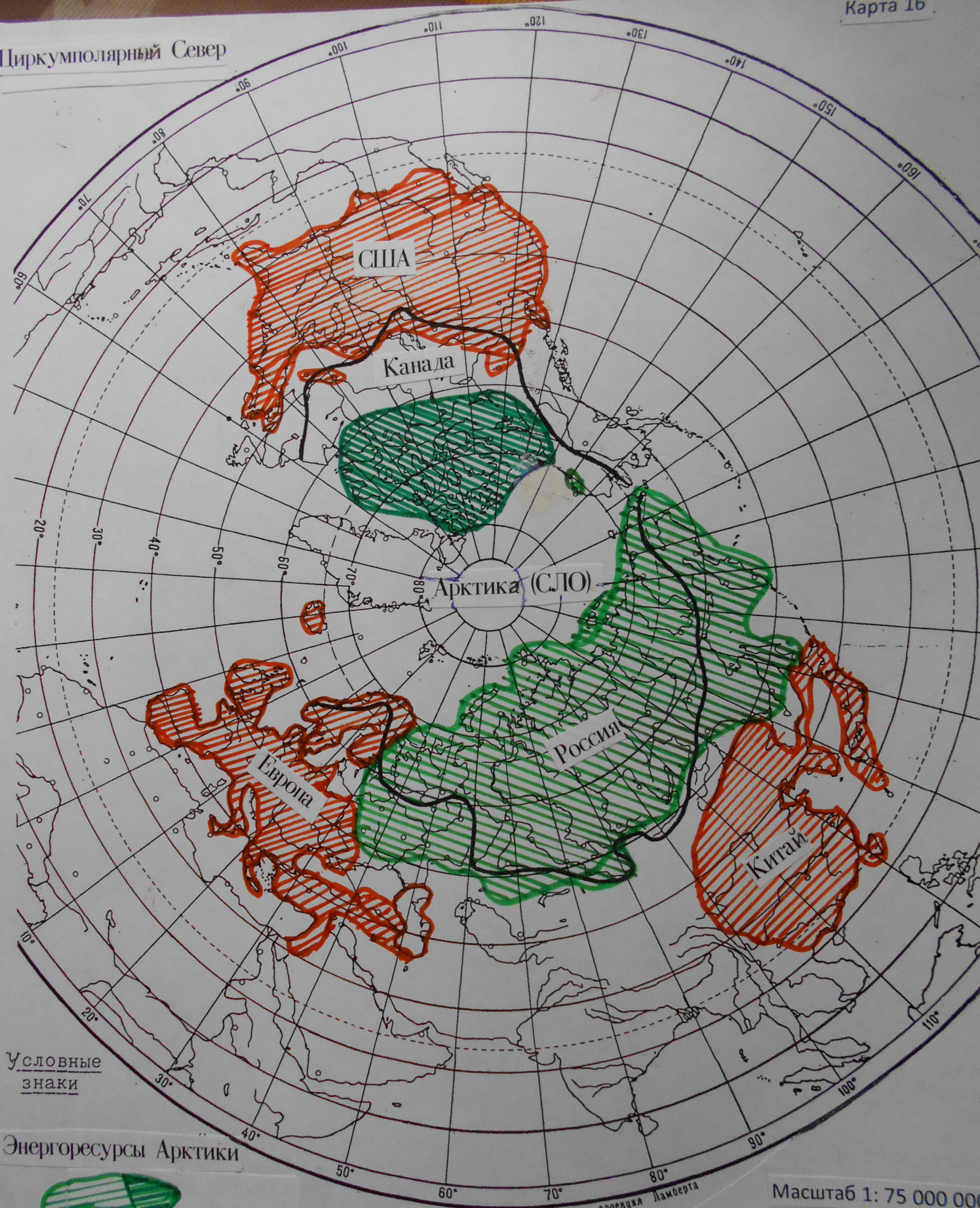
Энергетическое Кольцо



-  Pacific, Atlantic and Arctic Oceans
-  Limit of Arctic Basin (watershed)
-  Largest rivers of Arctic Basin
-  Long-distance management and control of nuclear power stations
-  International border
-  Area of industrial territories (consumer-countries and regions Arctic nuclear power stations and energy system of electricity production
-  Long-distance electricity transmission system

From: Ludmila N. ...

Циркумполярный Север



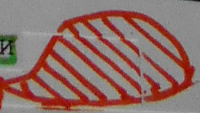
Условные
знаки

Энергоресурсы Арктики



основные производители

Страны-потребители энергии



равновеликая проекция Ламберта

Масштаб 1: 75 000 000

водораздельная граница бассейна СЛО



EUROPE'S GRID OF THE FUTURE

Last November 8, more than half of Spain's electricity was wind generated, and it even exported some to its neighbors—a hopeful sign, but one that lasted only a few hours. Europe's goal of getting 20 percent of its energy from renewables by 2020 will require “more of a revolution than an

evolution,” says Daniel Dobbeni of ENTSO-E, a grid operators association. Nine northern European countries agreed last year to link their grids by building transmission lines under the North Sea. A more futuristic vision: new lines under the Mediterranean to tap solar power from the Sahara.

NGM MAPS. SOURCES: 3TIER (SOLAR AND WIND DATA ANALYSIS); PLATTS, A DIVISION OF MCGRAW-HILL COMPANIES (PROPOSED GENERATION AND TRANSMISSION INFRASTRUCTURE); DESERTEC; SUPERSMART GRID (DC CONCEPTUAL NETWORK)

Потребители энергии в Европе. Тепловые и электрические станции. Основные ЛЭП.

2003 BLACKOUT
 Eight states and Ontario, Canada, (purple area) lost power in the 2003 blackout. It was a dramatic reminder of the vulnerability of the existing grid.

California imports more electricity than any other state. Sources include hydroelectric plants in the Pacific Northwest and coal-burning ones in the desert Southwest. The Oregon-southern California link is the largest single transmission line in the U.S.

THE GRID TODAY

More than 150,000 miles of high-voltage transmission lines carry power from 5,400 generating plants owned by more than 3,000 utilities. Most of those lines carry alternating current (AC), but 1.9 percent of them carry direct current (DC), which loses less power over very long distances. The grid works 99.97 percent of the time—but power interruptions

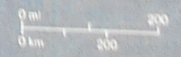
still cost the American economy about \$80 billion each year. Moreover, our electricity is anything but clean. Most of it comes from burning fossil fuels, about half of it from coal. Hydroelectric, wind, and solar power account for less than 8 percent. The infrastructure perpetuates this: Texas currently has more wind-generation capacity than the grid can handle.

Power plants, 2009
 (in megawatts)

- Greater than 2,000
- 250 to 2,000

Transmission lines, 2009
 (direct or alternating current, in kilovolts)

- DC (variable)
- AC 735-999
- AC 230-734
- AC 100-229*



*TRANSMISSION LINES BELOW 100 KV CAPACITY ARE NOT SHOWN.
 MARIIN GOMACHE AND SAM FERRELL, NEM STAFF
 SOURCES: NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION; EARTH & DIVISION OF MCGRAW HILL COMPANIES (GENERATION AND TRANSMISSION INFRASTRUCTURE); U.S.-CANADA POWER SYSTEM OUTAGE TASK FORCE; U.S. DEPARTMENT OF THE ENERGY