

Background for New UNECE / FAO Boreal Forest Team of Specialists



Guy Robertson

US Forest Service, Research &
Development

April 22, 2020

With thanks to Peter Blomback, Swedish
Forestry Agency

Near Haines Junction, Yukon, Canada

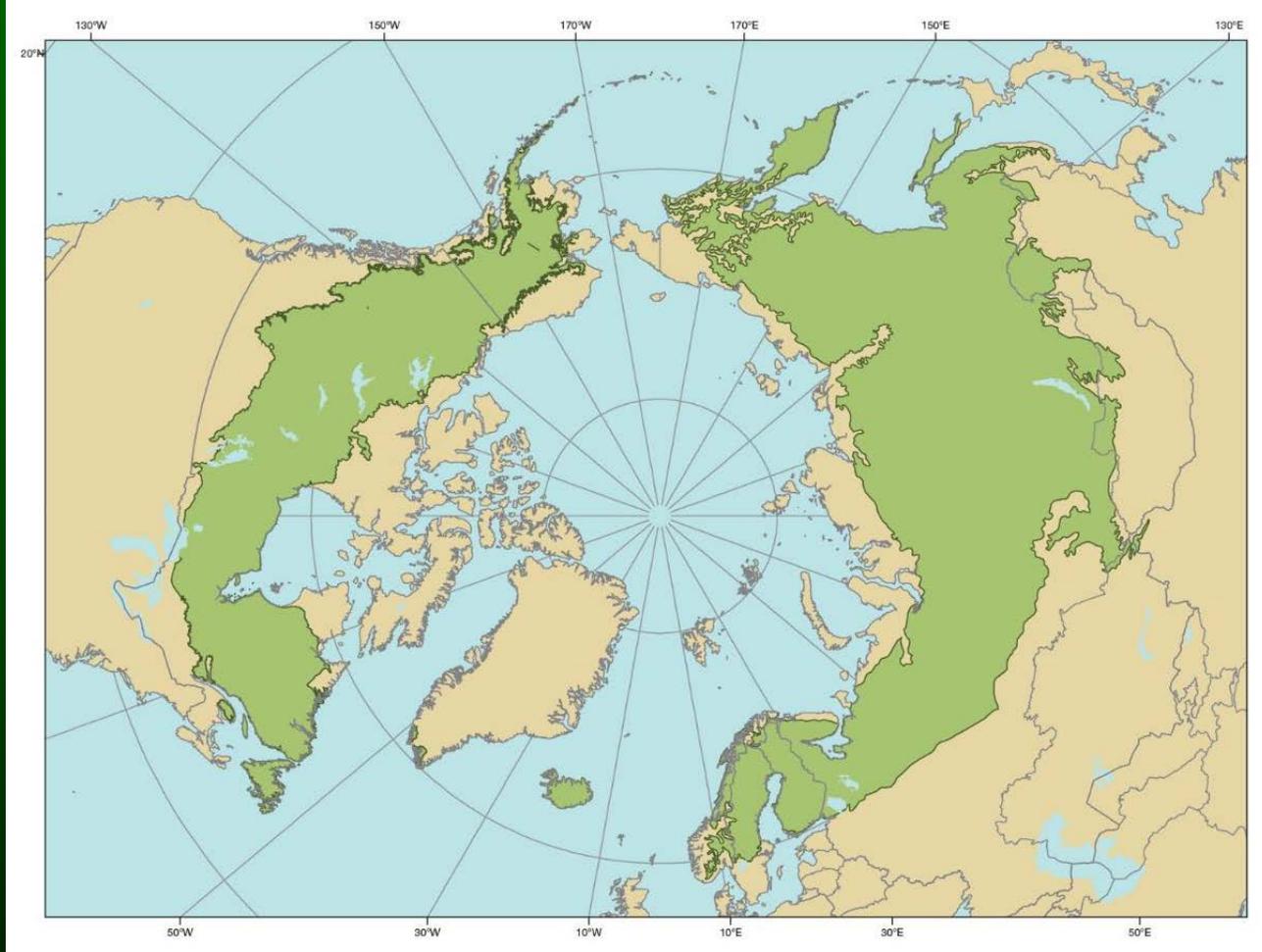


Outline



- General Description of Boreal forests and their key characteristics
- Opportunities for boreal forest management
- Challenges associated with boreal forests and their management

General Description (extent)



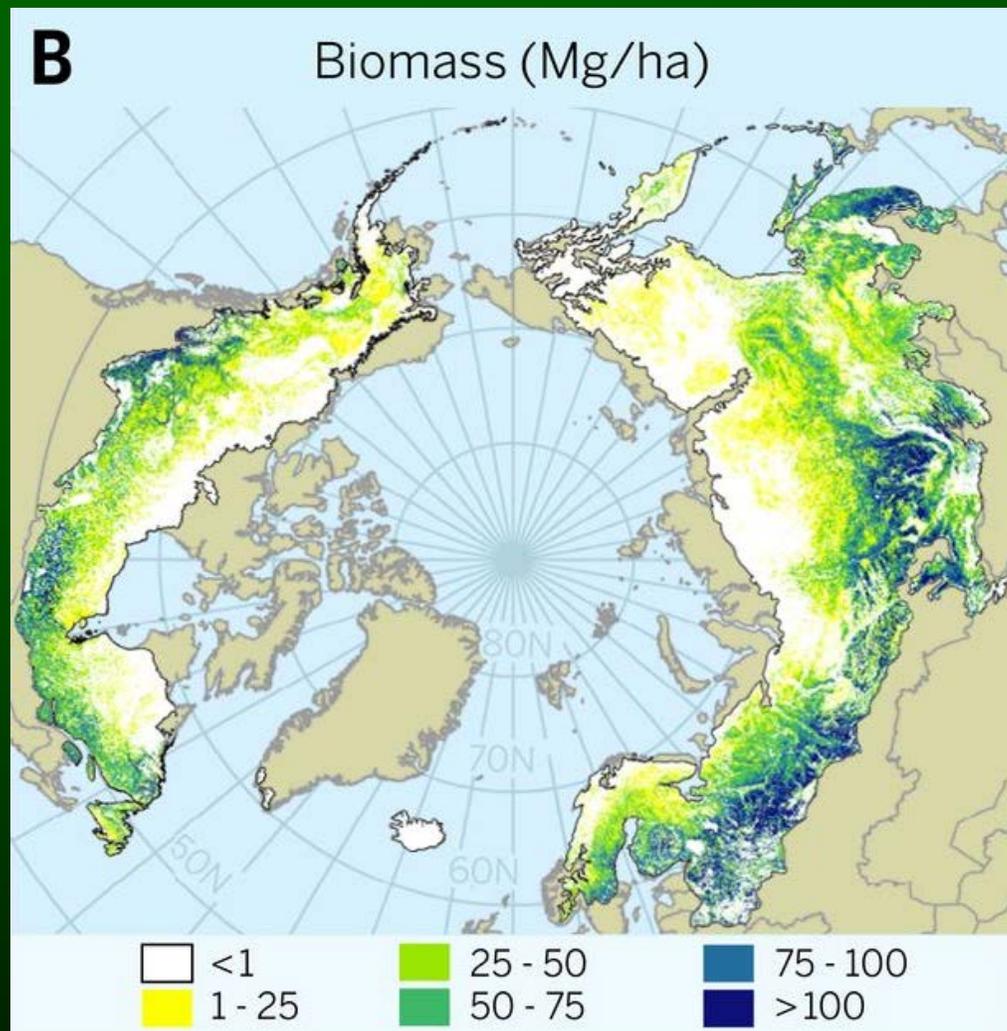
- “Boreal Domain” represents about 30% of global forest area
- Slow growing, cold tolerant species (e.g., spruce, larch, fir, pine, poplar and birch)

General Description (country totals)

- The Russian boreal forest is estimated at 717 million ha. (88% of all Russian forest land), and about 60% of the world's boreal forests.
- Canada—270 Mha boreal forest (75%+ of Canada's forest land)
- USA—40-50 Mha boreal (appx. 15% of total US forests)
- Norway's, Sweden's and Finland's forests (12 million ha, 28 million ha, 22 million ha, respectively) fall mainly within the boreal zone



Description in Greater Detail



- Total area 1135.2 mln ha (29.5%)
 - Russia (61.2%)
 - Canada (29.7)
 - USA (5.1)
 - Finland (1.9)
 - China (1.1)
 - Sweden (0.8)
 - Norway (0.7)
- Carbon stock (32%)

	272±23 Pg C
• Live biomass	51.5 Pg C (19.9%)
• Dead wood	14.5 (5.6)
• Litter	25.6 (9.9)
• Soil (1m)	167.0 (64.6)
- Total C sink in global forests 2.4±0.4 Pg C
 - boreal forests 0.5±0.08 Pg C

General Description (biophysical characteristics)

- Slow growth and low productivity (in terms of timber volume at least)
- Limited but unique set of biodiversity
- Disturbance processes prevalent and formative
- Varying densities and spatial distributions
- 559 Gt carbon (trees, soils and peatlands)—largest terrestrial sink
- Uniquely susceptible to climate change



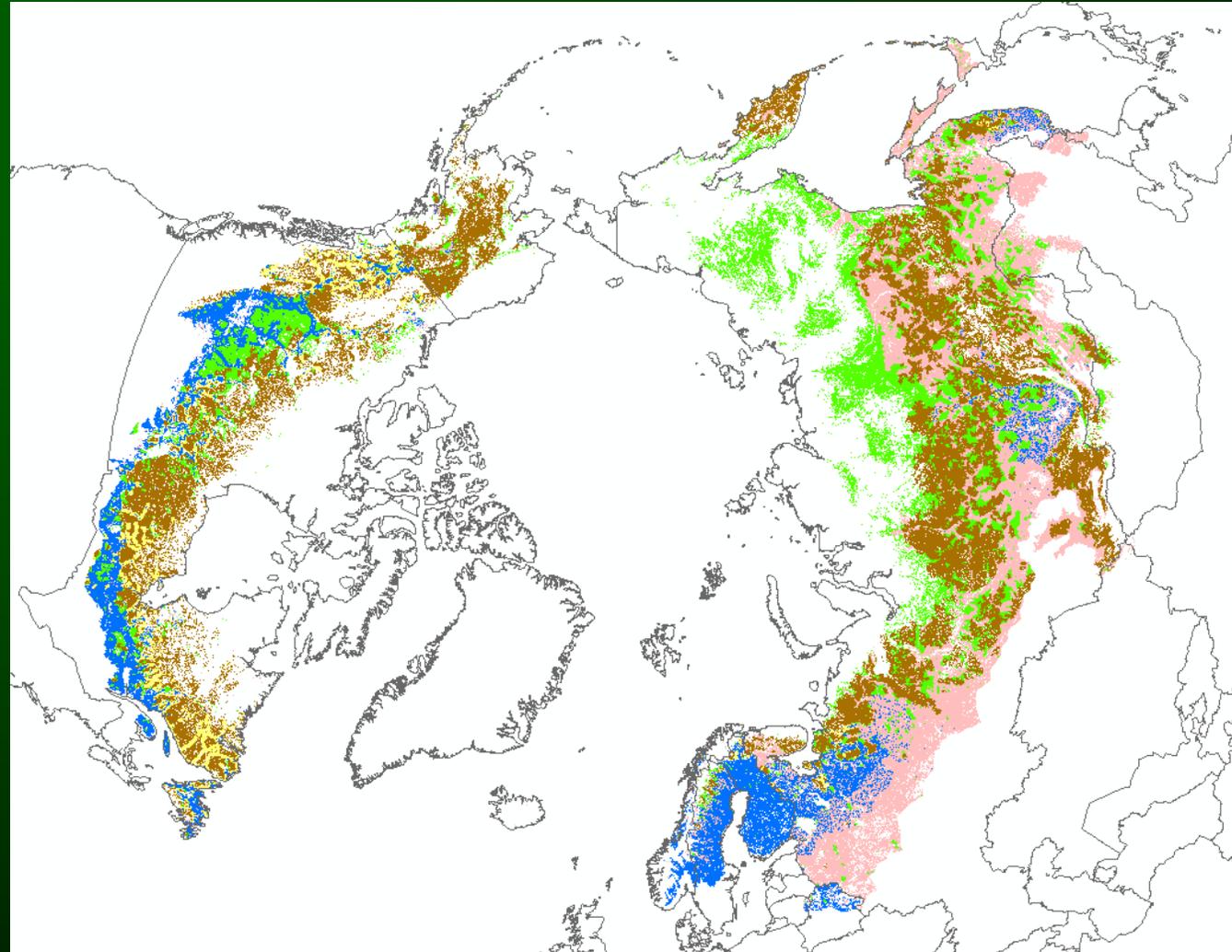
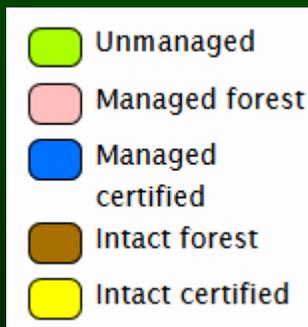
General Description (socioeconomic characteristics)

- Varying degrees of forest sector economic development and integration at national level
- Remote and sparsely populated
 - Commensurately large subsistence and lifestyle contributions to rural residents
 - Forest sector dependency where harvest and processing is prevalent
- Native peoples constitute a relatively large proportion of the population and an important consideration for governance and management



Diverse forest management situation in boreal zone

Area of managed and certified forests in Canada and Nordic countries 190 mln ha, in Russia 30 mln ha



Source: <http://forest.geo-wiki.org>; Kraxner et al. 2017

Opportunities



- Timber sector development through efficiencies and innovation
 - Biochemicals and biomaterials
 - biofuels and other energy applications
 - The production of long-lived wood products that store carbon
- Local income through tourism and recreation, non-wood forest products, and etc.
- Opportunities will vary according to country and locality (likely subject for initial assessment)

Opportunities (2)



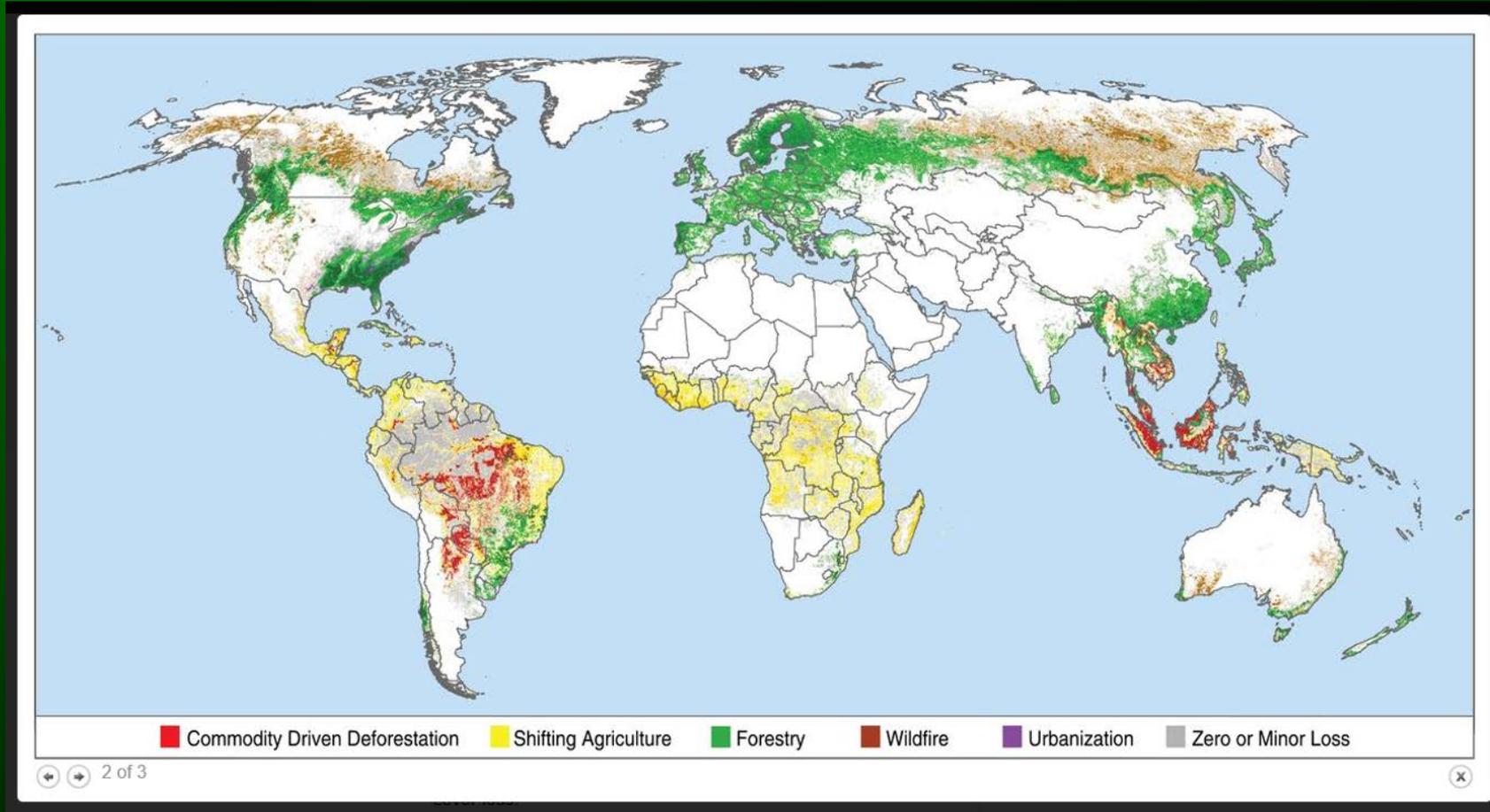
- Development of sustainable forest management models (and revenue streams?) tailored to boreal forest's unique characteristics:
 - Timber sector economic development
 - C sequestration and avoided C release
 - Biodiversity conservation
 - Benefits to rural communities and native peoples
 - Resiliency in the face of climate change

Challenges



- Remote location and high cost of operations
 - Extends to both production and forest management
- Slow growth impacting:
 - the economics of silviculture
 - The time dynamics and rationale for C sequestration efforts
- Managing for disturbance in a changing climate

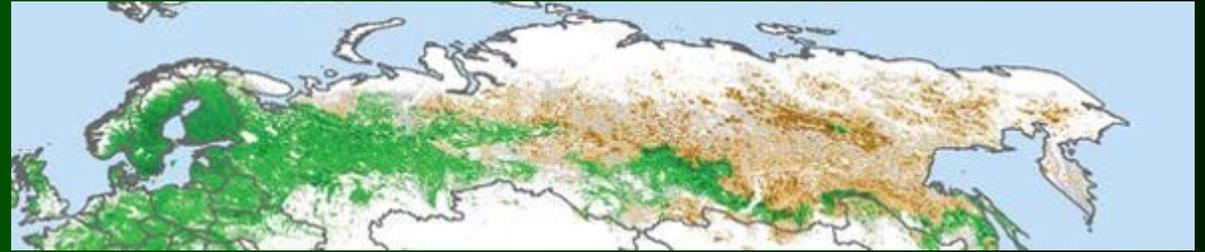
Challenges—Disturbance



Attribution of forest cover loss from satellite data

Source: Curtis et al. 2018, Science 361(6407)

Challenges—Fire



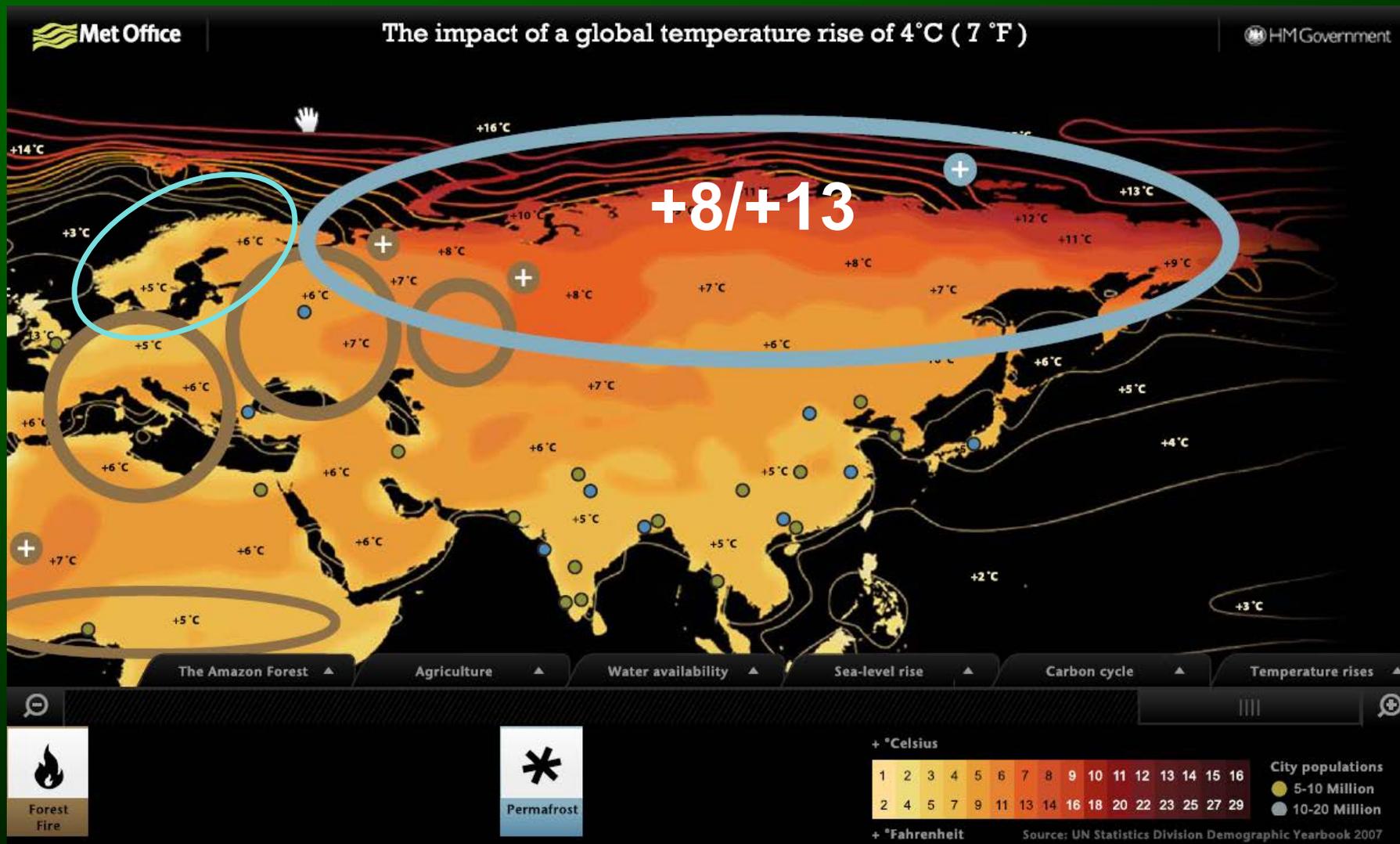
- Fire is prevalent in Alaska, Canada and Russia
- 1-3 Mha of fire extent in Alaska alone in bad fire years

Challenges—Climate Change



- Elevated temperature rise in boreal region relative to global totals
- Variable impacts
 - Increased growth
 - Increased disturbance (fire, insects, other?)
 - Changing species composition
 - Changing patterns of human settlement and forest use

Challenges—Climate Change



Impacts of environmental changes on forests will be **both positive and negative**: growth, mortality, disturbances.

Understanding **where, when and how** these impacts will occur is necessary to design effective climate change mitigation and adaptation strategies for the boreal forest sector.

(Source: Tchebakova et al., 2009)

... will potentially lead to 20-50% loss of Siberian boreal forest

Conclusion



Boreal forests constitute a major terrestrial resource and bioregion whose diversity and complexity matches that of temperal forests in the UNECE region. Sustainable management is a pressing need, especially in the face of climate change.

The formation of the new Boreal ToS presents an opportunity to further promote sustainable management of these forests. However, given the complexity of the resource and the issues it faces, problem definition and focus will be a major initial challenge for the team.

The End



Thank You