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# *CLIMATE CHANGE AND RUSSIAN FORESTS: IMPACTS, VULNERABILITY AND ADAPTATION NEEDS*

*Online awareness raising workshop  
30 March 2021*

## *FOREST GOVERNANCE AND ADAPTATION NEEDS*

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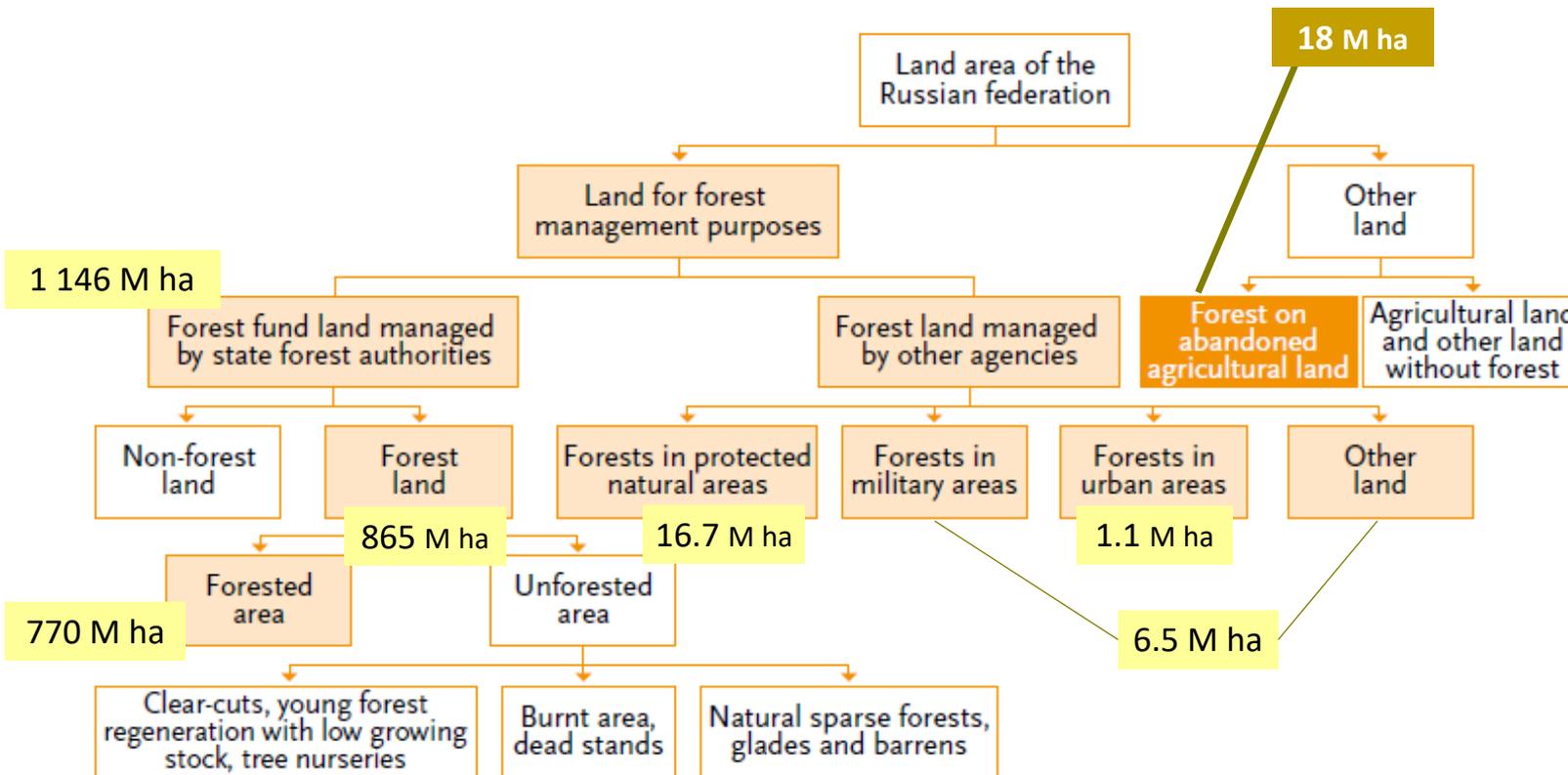
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Supported by



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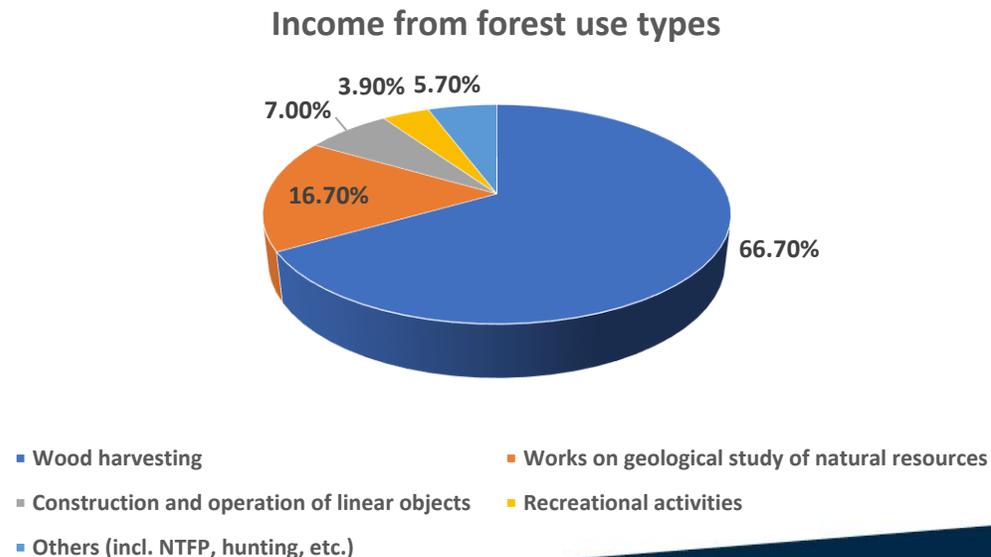
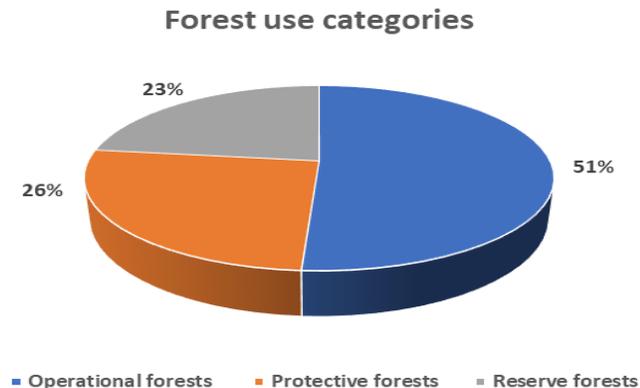
# Russian forests and forestry



**Figure 1.** Overview of land-use/land cover categories of Russian forests. The shaded boxes are indicated as forest land according to the national forest definition in official statistics (see Box 1). Forest on abandoned agricultural land includes areas outside of official forest statistics that may be detected as forest with remote sensing observations.

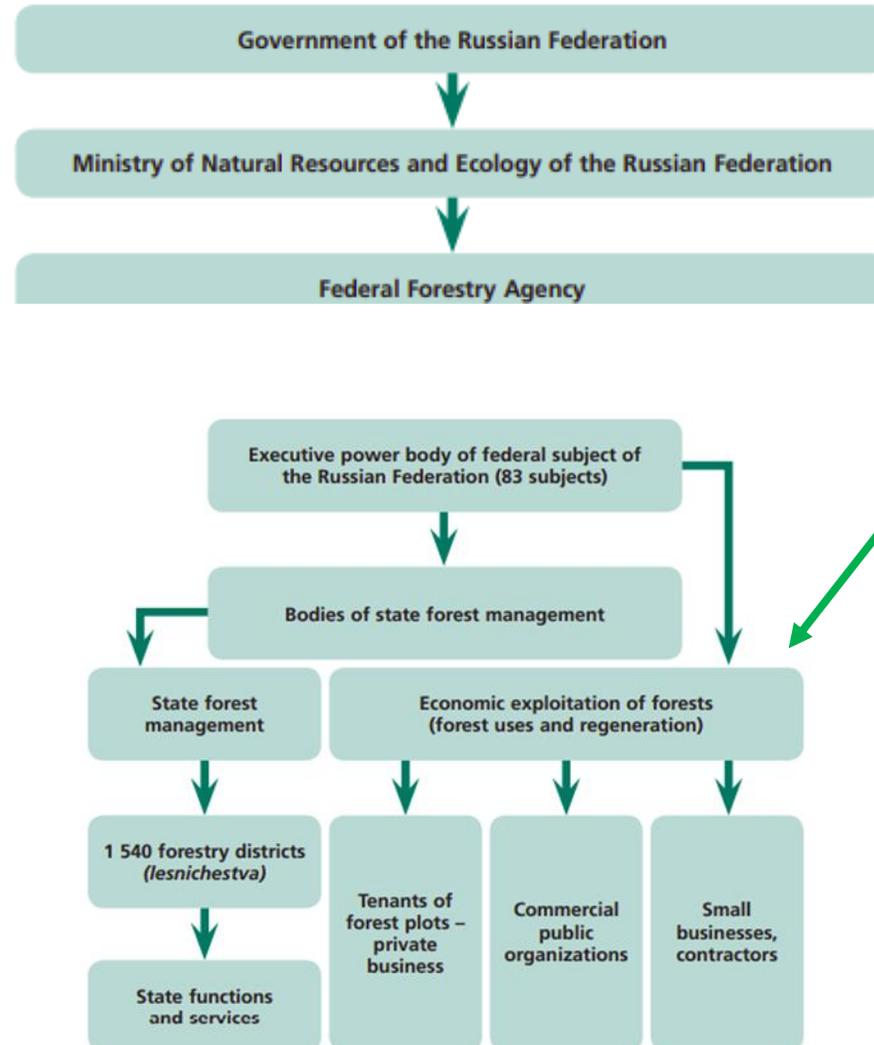
- Russia hosts almost 800 mill. ha of forests that fulfil diverse ecosystem services vitally important for human society nationally and globally
- Land inventories in Russia use diverse classifications of forest cover – which may complicate comparison of forest information
- Russian forest fund land includes also some non-forest lands as wetlands
- The area of forests on abandoned land is according to remote sensing estimates quite large

# Forest use categories and types



- Forest fund lands are divided into three *forest use categories*:
  - Operational: exploitable forests available for industrial harvesting
  - Protective forests: fulfil numerous protective and regulative services (for example, nature protection areas, urban forests or water protection forests)
  - Reserve: remote forests without plans for wood harvesting until 2026. Insufficient infrastructure. Cannot be considered as manageable
- *Forest use types* relate mostly to resource utilisation such as wood, non-wood products, mineral exploitation or recreation in urban forests. Much less attention is paid to forest conservation and forest restoration
- Only 4 types of forest use provide the main income of payments to the Russian budget. These include timber harvesting, geological exploration and mining, construction and operation of linear facilities, and recreational activities

# Governance structure



- Major source: FAO (2012) Outlook Study
- The Forest Code of the Russian Federation (2006) is the main document regulating forest-related matters in Russia: multiple changes in forest legislation; calling for a new Forest Code from a broad range of stakeholders
- State forest management at the federal level: Ministry of Natural Resources and Environment and Federal Forestry Agency of the Russian Federation
- Decentralization and transfer of state supervisory functions related to forests to the authorities in 85 administrative regions grouped into 8 Federal Districts
- Local level: 1650 state forest management enterprises (lesnichestvo)
- Wood harvesting is carried out based on different approaches but the most common legal form is forest lease agreements, covering 27.5% of the forest area (excluding reserve forests)
- Strategic forest policy documents : “Fundamentals of state policy in the field of use, guard, protection and reproduction of forests in the Russian Federation for the period up to 2030” (2014), the Forest Code (2006), the “Strategy for the development of the Russian Federation’s forest complex until 2030” (2018), the State program of the Russian Federation “Forestry development” (2013).

# Key challenges in forest resource management



Abundant challenges (stated e.g. in the Russian forest sector outlook study to 2030, FAO, 2012)

Political, social and economic changes in Russia since end of 1990s resulted in deteriorating forest governance

Numerous reforms

- new legislation
- elimination of forest guard
- deteriorated economic condition and organization of managing forest fires, protection against pests and diseases, forest inventory services, etc.
- forest leasing strategy facing problems

The resource role of forests dominates over other ecosystem services

A need for new forest policies and significant investments in the Russian forest sector

- Need to ***replace the exploitative extensive forest use with sustainable intensive forest management***

# „Extensive“ exploitative use

means, e.g., limited efforts invested in forest regeneration

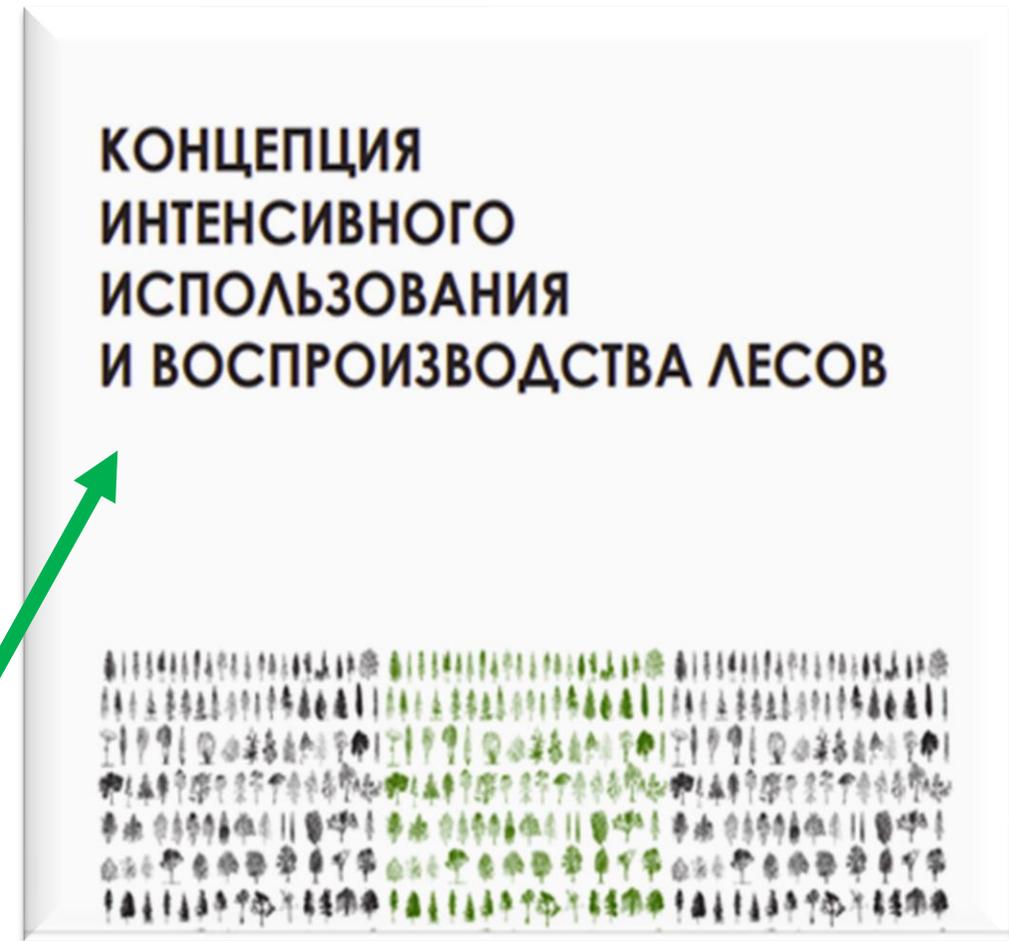


Fotos: Greenpeace Russia webpage

<http://www.forestforum.ru/viewtopic.php?f=44&t=21586&hilit=%D0%BB%D0%B5%D1%81%D0%BD%D1%8B%D0%B5+%D0%BA%D1%83%D0%BB%D1%8C%D1%82%D1%83%D1%80%D1%8B&view=print>

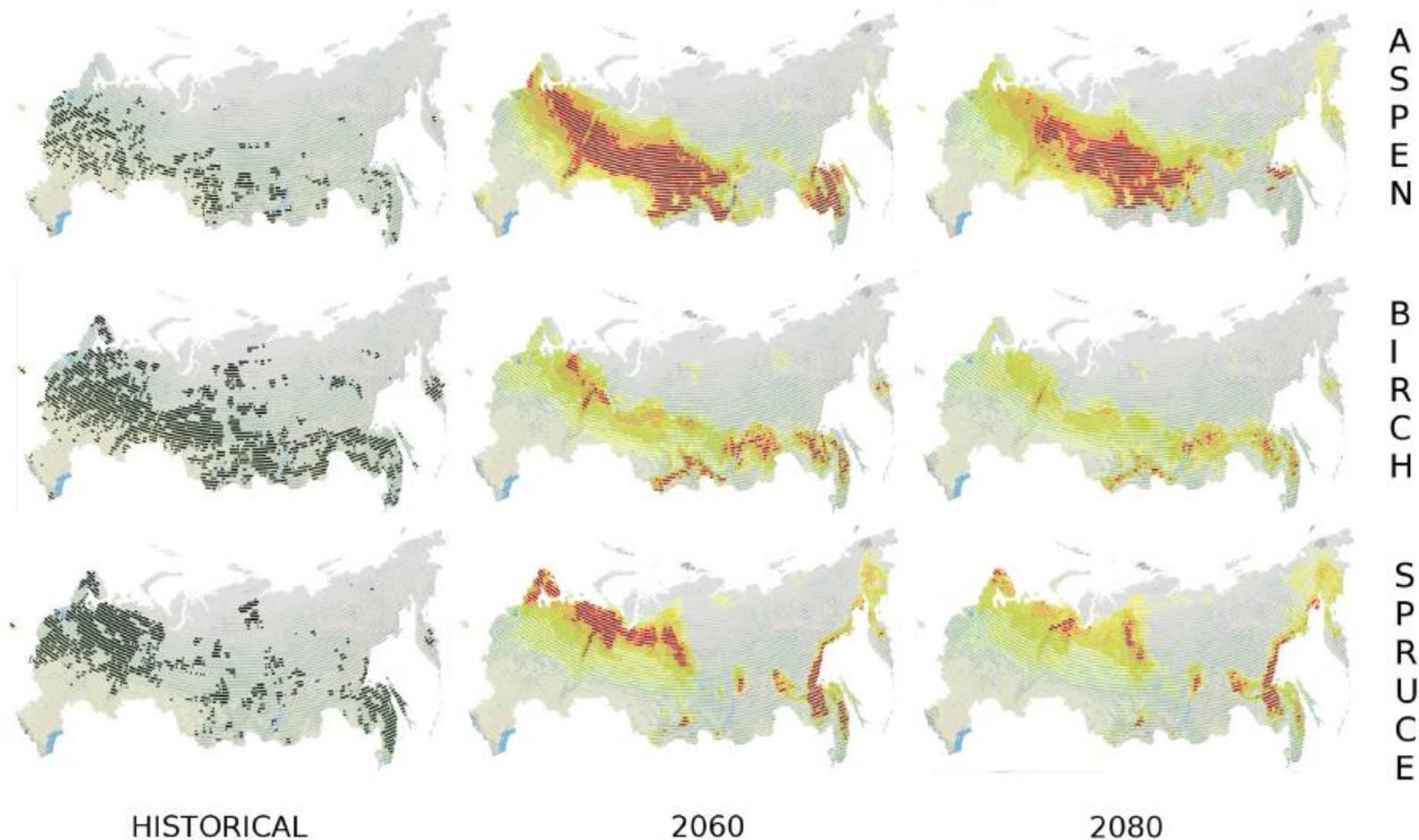
# From exploitative to sustainable forest management

- Extensive exploitative model of forest use aiming at maximizing income with only limited interventions dominates
- Features:
  - clear cut harvesting of most productive and accessible stands,
  - extending into new forest territories,
  - incomplete use of wood of lower quality and less valuable species,
  - natural non-assisted regeneration,
  - lack of tending in young stands: thinning or selective cutting insufficiently performed.
- Result:
  - degraded quality of forest resources
  - undesirable change of species composition
  - decreasing volume of economically accessible forest resources
- Urgent need for new developments and innovative solutions for forestry practices
- In 2015, the “Concept of intensive use and restoration of forests in the Russian Federation” approved and started to be implemented in pilot regions of North-West Russia and Eastern Siberia



# Forest management needs to be adapted in response to climate change

Projected changes in species ranges based on the Cascade Ensemble System (Noce et al. 2019)



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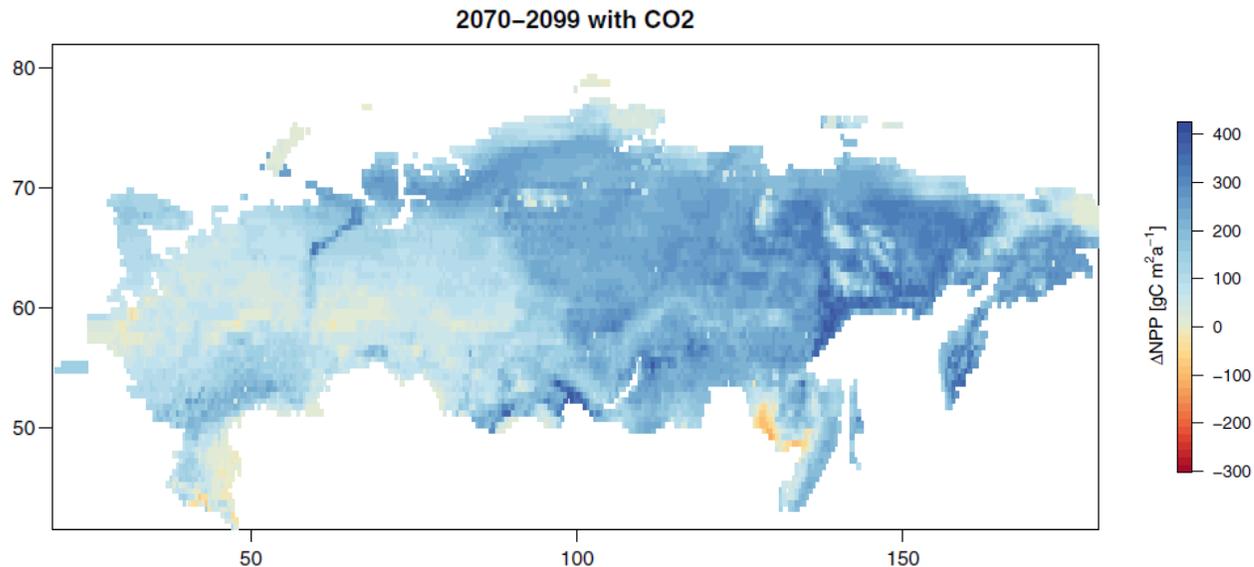
- Project impacts of Climate change will affect species competitiveness
- Especially at the warm/dry range distribution limits species may not be able to survive
- Suitable area for birch, pine and larch is shrinking, while it increases for aspen and fir and remains more or less constant for cedar and spruce

# Projected impacts of climate change – increased disturbance risks

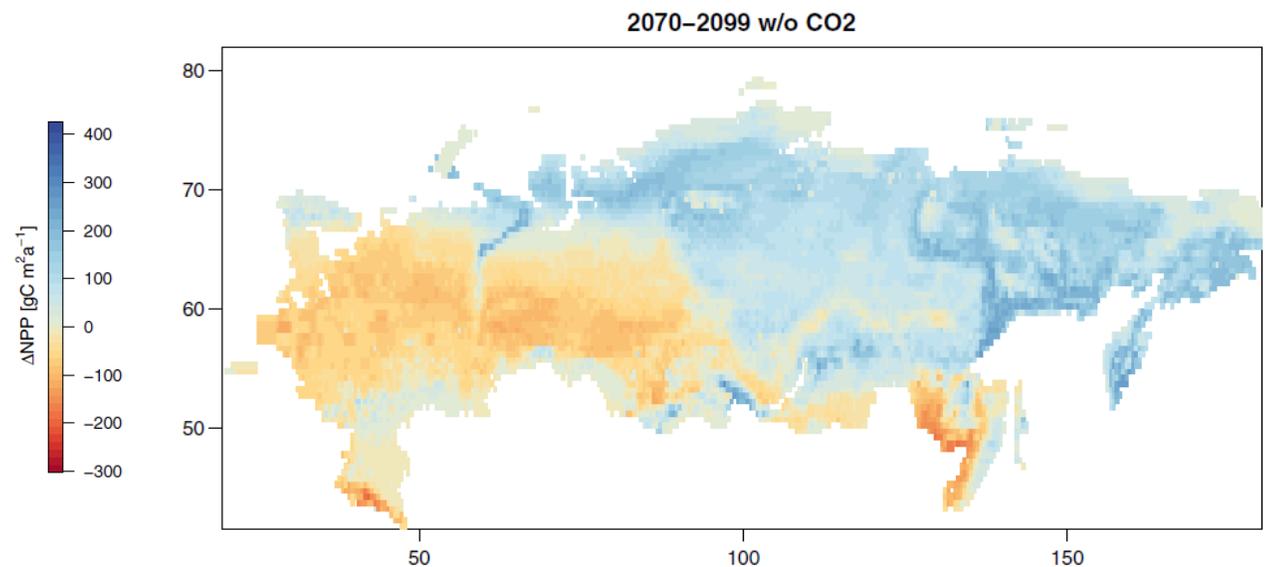
- Especially **boreal forests are likely to face stronger effects of direct and indirect disturbances** (Seidl et al., 2017), recent dramatic fire seasons and insect outbreaks have pointed already in this direction!
- **Increased length of the season with fire danger:** 10 to 20 days longer in 2041–2060 compared to 1980–2000.  
By 2080–2090 an additional 20-50 fire risk days were projected for European Russia, West Siberia, and the south and mid-latitudes of East Siberia (Ensemble of 31 climate models using RCP4.5 and RCP8.5; Sherstyukov and Sherstyukov 2014).  
Similar results were found by Torzhkov et al. (2019), except where regionally increased precipitation would mitigate the risk.
- The **combination** of climate change-induced **shifts in species ranges** and **forest disturbances** could affect forest dynamics and functioning more drastically, leading to **tipping points in the global climate system** (Lenton et al., 2008).
- Strong, **drought-driven tree mortality** interacting with increasing insect and fire disturbances may further increase the susceptibility of forests **to large-scale dieback under global warming levels above 3°C global warming** (Lenton et al., 2008; Schellnhuber et al., 2016).
- It is still unclear whether the projected disturbance dynamics may result in irreversible forest loss.

# Projected impacts of climate change

Changes in projected forest Net-Primary Production (NPP) from an ensemble of 2 Dynamic Global Vegetation Models and 4 Global Climate Models driven by the RCP8.5 emission scenario



- Increasing forest NPP is projected in most parts of Russia: not all forests will necessarily suffer from climate change if there is enough water and limited disturbances
- However, **great sensitivity to CO<sub>2</sub> fertilization**
- No disturbances other than fire included (only generic mortality), possibly picture is too optimistic
- Many ecological studies indicate **high risk for regional forest decline** due to drought and disturbances



# Poor transport infrastructure becomes a bottle-neck in warmer winters

- A crucial problem for the Russian forest sector is the lack of all-season roads (Goltsev et al., 2011)
- Logging and transport of wood heavily depend on weather conditions. Warm winter months (e.g. in 2006, 2007, 2011, 2019 and 2020) lead to substantial difficulties in wood removal
- Estimates suggest that warm winters decrease the amount of wood harvesting, delivering and processing by about 30%. This may lead to an increase in prices for forest products by 15–20% (Fomicheva, 2020).

28.01.2020 14:37 Рубрика: Экономика



## Зима заблудилась

Лесная отрасль оказалась в кризисной ситуации из-за аномально теплой погоды

Текст: Марина Ледяева (Архангельская область)

Российская газета - Экономика Северо-Запада № 16(8070)

Лесопромышленники Поморья бьют тревогу: из-за отсутствия морозов заготовка древесины практически встала во всех районах области. Аномально теплая зима не дает обустроить ледовые переправы через реки, а также зимники - снежные дороги. В итоге лес невозможно вывезти с делянок. Давно сложившаяся логистика попросту не работает, а поиск новых путей - дело не быстрое. Страдают все: и компании-гиганты, и небольшие лесопилки. Представители отрасли оценивают ситуацию как чрезвычайную.



В прошлые годы заготовка древесины проходила в более благоприятных условиях. Фото: Алексей Никольский/РИА Новости

<https://rg.ru/2020/01/28/reg-szfo/lesnaia-otrasl-okazalas-na-grani-krizisa-iz-za-teploj-zimy.html>

# Adaptation needs

- The requirement (since 2017) to develop adaptation measures in forest plans is a progressive step in Russian forestry
- However, adaptation measures are still developed without considering climate change, because information on climate change and its impacts on forests at the regional level is lacking
- Improvement of knowledge and operational monitoring is a key requirement for the implementation of adaptive forest management in Russian forestry

**Table 2.** The list of adaptation measures according to the standard form of the regional forest plan.  
Source: Order of the Ministry, 2017.

Climate change induced risk	Adaptation measure
Change in forest productivity due to changes in average temperature and rainfall	Adjustment of the duration of the reforestation cycle and forest care rules taking into account forest productivity
	Correction of the list of species used in reforestation and afforestation processes
	Salvage cuttings in dead and damaged stands
	Diversification of forest management goals for forest products and services
Changes in the species composition of forests	Orientation to the cultivation of uneven-aged mixed-species stands
	Adapt tree species in reforestation and afforestation processes to predicted climatic changes
	Formation of specially protected natural areas for the conservation of vulnerable species and habitats
Increased incidence of forest fires and areas covered by fires	Identification and control of invasive tree species
	Improvement of the effectiveness of fire safety measures in forests, including forest fire prevention, fire hazard monitoring in forests and forest fires
An increase in the frequency of outbreaks of pests in forests	Correction of plans to extinguish forest fires in connection with an increase in the frequency of occurrence of forest fires and areas covered by fires
	Improvement of the system of forest pathological examination
Increased frequency of extreme weather events in forests	Improvement of pest prevention measures
	Adjustment of the duration of the reforestation cycle to minimize the risks of windfall and windbreak in forests
	Improvement of timber harvesting technologies to minimize the risks of wind damages in forests
	Formation of uneven-aged mixed and multi-tiered stands

# Conclusions

- Climate change impacts will put the current forest sector severely at risk – sustainable utilization of Russian forest resources in the future critically depends on **improved forest governance, national forest inventory and forest monitoring**
- **Future natural disturbance** impacts may lead to a **substantial decrease of the Russian forest carbon sink** - high attention should be directed to **disturbance prevention** and **enhanced forest resilience**
- Due to the recent and projected future large-scale natural disturbances, **large scale forest restoration and reforestation are needed**, which requires active support
- Active **adaptive forest management is needed** to reach the Paris Agreement targets – to achieve this an improved implementation of research results in practice is crucial