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**Changes in individual components of floodplain
ecosystems in the tundra zone due to
hydrocarbon contamination at Kumzhinskoe
condensate field**

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Pechora delta



Kumzhinskoe condensate field

- 1974 – start of development
- 1980 – The first accident
- Flow rate from accident well in 1981 was up to 2 million m³/day.
- In may of 1986 it was 1.74 million m³/day.
- 1987 - a nuclear explosion at a depth of 1,5 km, with a capacity of 37,5 kilotons of TNT was used to block the well flow.
- 1997 - formation of Nenets state natural reserve

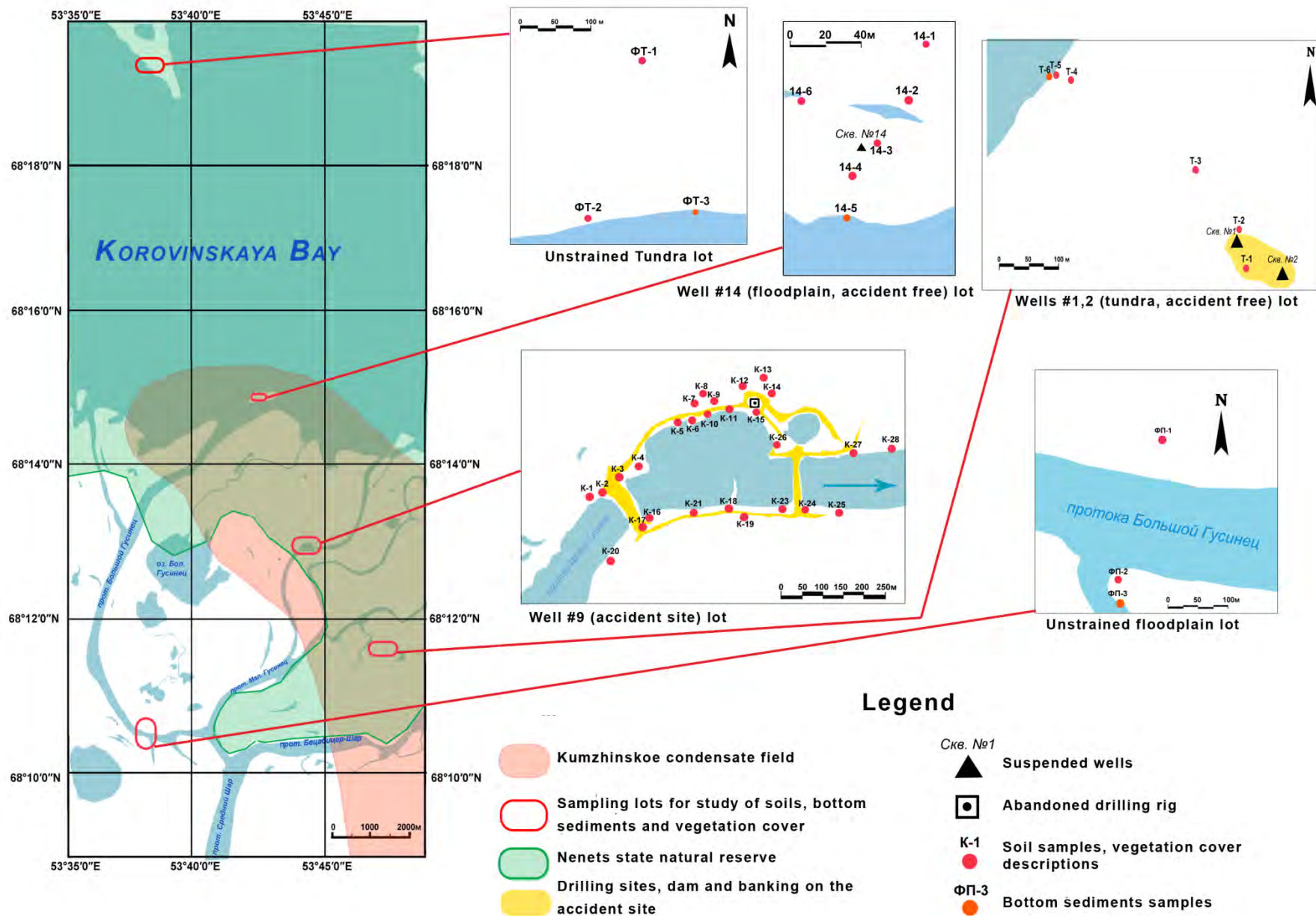
Kumzhinskoe condensate field



Relevance of the study

- According to the estimates of the US Geological Survey, the circumpolar territories account for about **25% of the world's supply of hydrocarbons**. Timan-Pechora basin province is one of the biggest ones in Arctic region.
- The estimated means for conventional resources in portions of the Main Basin Platform AU and Foredep Basins AU north of the Arctic Circle are **1,668 million barrels of oil (MMBO)**, **9,062 billion cubic feet of natural gas (BCFG)**, and **204 million barrels of natural-gas liquids (MMBNGL)**
- Northern ecosystems (e.g. tundra) have proven to be very sensitive to **resistant organic substances pollution** and anthropogenic loads in general.
- Studies of **long-term consequences** of hydrocarbon pollution may be useful for oil companies and scientists, working in different fields of work.

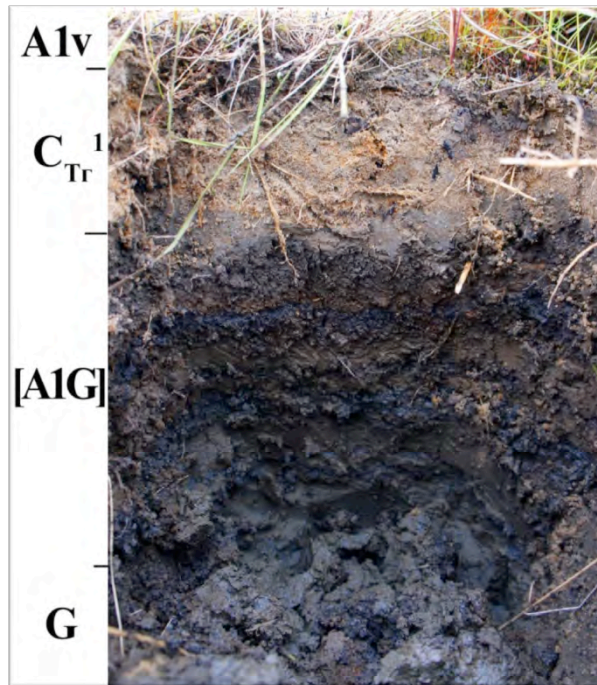
Research objects in 2011-2013



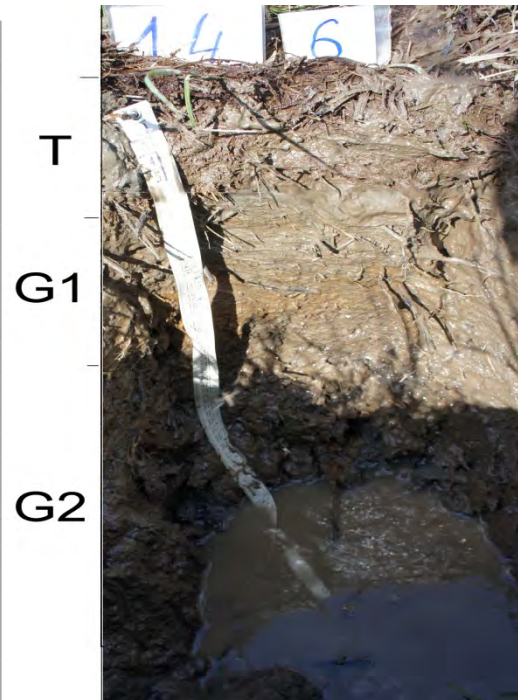
Accident site in 2013



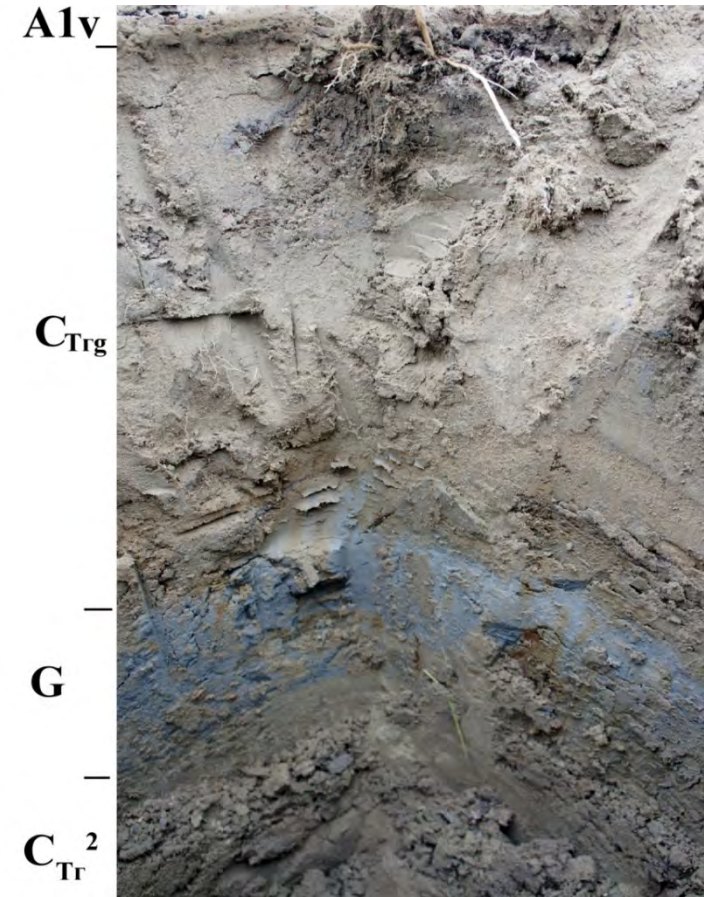
Changes of soil morphological properties



Interlayers of clay material with visible hydrocarbon contamination in the buried soil

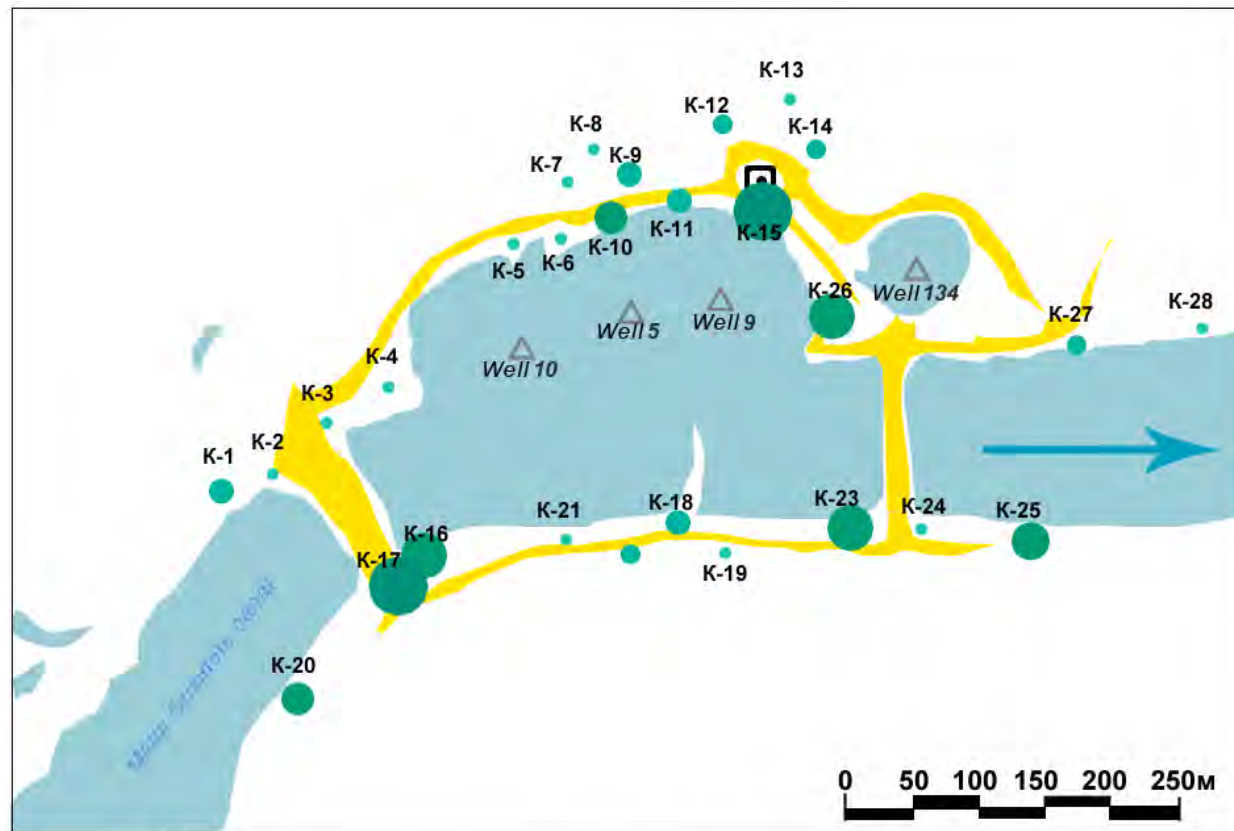


Changes in horizons structure, appearance of gleying process



Bunding on the accident site: gleying process in the middle of profile due to different porosity

Total petroleum hydrocarbons (TPH) on the accident site, 2011



Legend

- Banking and dam
- Submerged well
- Abandoned drilling rig
- K-1 Samples

Total petroleum hydrocarbons (TPH) g/kg

- <0,1
- 0,1 - 0,5
- 0,5 - 0,75
- 0,75 - 1
- 1 - 5
- 5 - 10
- 10 - 25

Oil film on water, Malui Gusinets canal



Changes in vegetation cover near accident-free wells





Pechora delta is home to many endangered species







Thank you for attention

