Responding to Tundra Fires in Northeastern Siberia, Yakutia and Chukotka

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Abstract

This work report documents Siberia, Yakutia and Chukotka efforts in 2021-22 to outline the discoveries from the partnerships with Indigenous communities to respond to the never-before-seen tundra fires. Whilst only a limited number of actions could be implemented, this report conveys messages from remote communities and their priorizations on the question of new fires and outlines solution spaces relevant for NE Siberia.

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Introduction

Using support from the Montpelier Foundation in 2021, Snowchange and local authorities started to build capacity and means of responding early to the emerging tundra fires in Northeastern Siberia. This collaboration with Russian scientists, local communities and Snowchange continued until the Russo-Ukraine War started in February 2022. On the other hand, the Kolyma region and Yakutia are centered in the global nexus of tundra and forest fires. These issues are not disappearing even though transformative events are under way.

Despite this catastrophic war of 2022 we bring forwards the outcomes and discoveries from the partnerships in this short technical report – with the aims of having these messages ready when, if at some future point in time international collaborations resume, the capacity to respond will be supported.

A Yukaghir youth and the ice.
Yekaterina Surshannova, used with permission

Overview of the Fires in Recent Years: Yakutia and the Project Actions

Responding to Tundra Fires actions priorised those parts of the Russian Arctic where harmful, new wildfires had been spreading to the tundra region for the first time in late 2010s. After careful self-reflection and consultations with national authorities, three remote regions were chosen - Nelymnaya, Alazeya, and Kolymskaya in the Republic of Sakha-Yakutia and Omolon in Chukotka Autonomous Region. Additional virtual workshops were held with the Ministry of Emergency Services in Yakutsk on wildfires and response capacity in November and December 2021.

Despite short implementation time each remote area was ready to appoint teams for fire detection, early response and committing to the tasks. In addition to the teams established the winter season 2021-22 was spent collecting participatory photos and videos from the community residents of the first ever tundra fires in 2018, and the burning peatlands in winter in 2021-22 winter season. These meetings focused on exchanges with the key official, Director of Yakut Forest Resources State Agency Julustan Khon and his key teams.

A community meeting in NE Siberia.
Photo: Snowchange

Additionally, in the extremely remote Andreyushkino community in the Alazeya river (Kolyma region) catchment in Sakha-Yakutia, oral histories were collected of the fires, permafrost melt events and a baseline extending to 1936 was created. Questions of mercury wash-out from burned areas were collected from the science data in Yakutsk.

Local Communities and Fires: Nelymnaya, Alazeya and Kolymskaya and Omolon – Summary Results

Overall the Siberian Times (2021) reported on the Fire Season of 2021 that the smog was affecting the regional capital Yakutsk as well as the Arctic Circle region. This report points to the fact that the climate-driven and other wildfires both in the forest zone and in tundra are not stopping. Science and local observations point to the fact that the fire regimes will become only worse in the coming years of 2020s. During the project workshops, Director of Yakut Forest Resources State Agency Julustan Khon in Yakutsk also confirmed this expectation on the national level.

Snowchange worked with the remote communities to collect first evidence, oral histories and materials and to coordinate response teams until February 2022 to respond specifically to tundra fires. In this section we offer early discoveries and commentary from each of the project regions, including visual histories (Mustonen 2015) for potential next steps.

Fisheries are central for the food security of the Indigenous communities. Photo: Snowchange

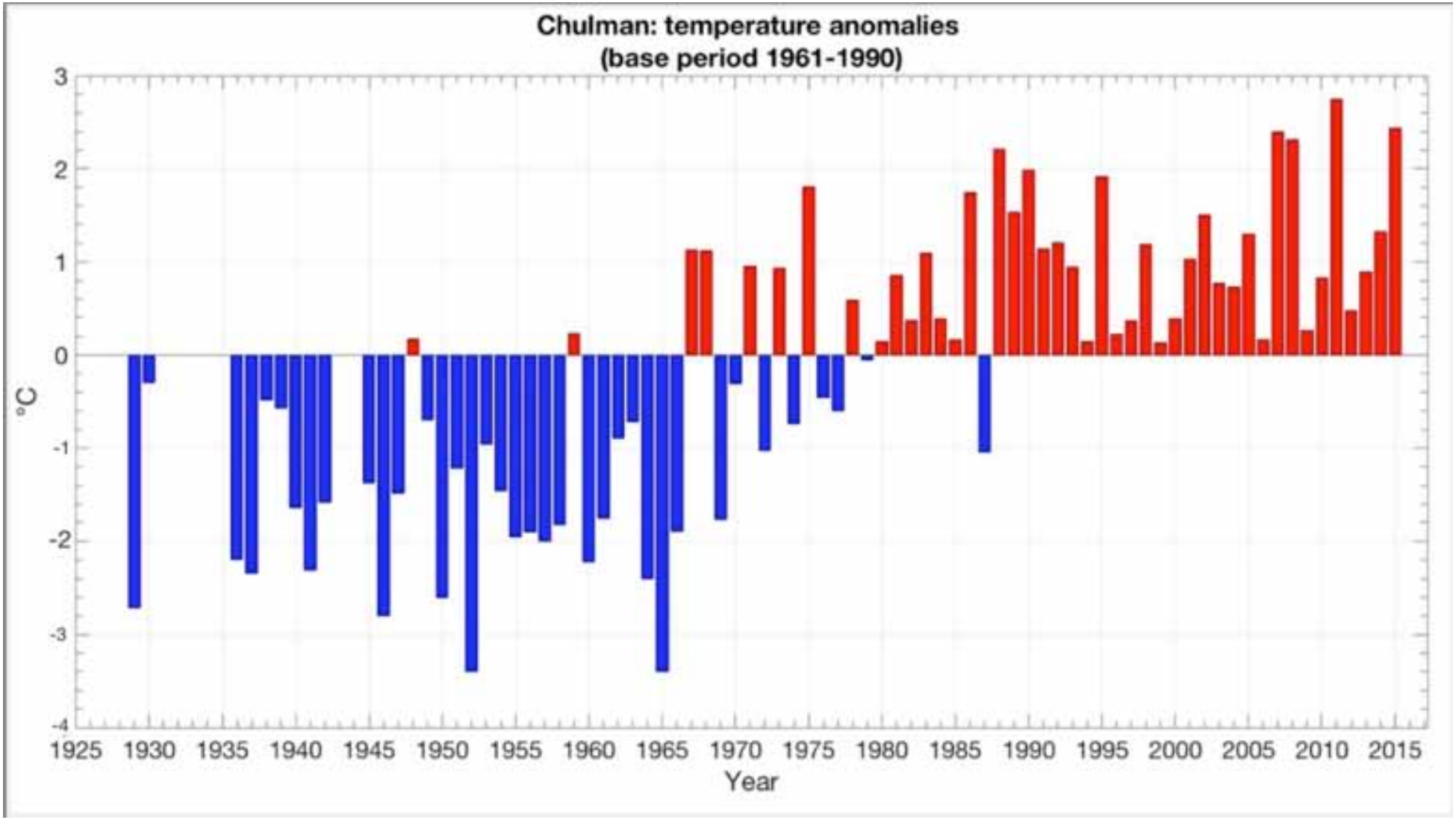
Nelymnaya

Nelymnaya is a forest Yukaghir community located in the middle parts of the Kolyma river, in the forest zone of Sakha-Yakutia. Regional coordinators detected the presence of harmful fires and effects to the community uses of the lands. In the work that was able to happen, place names, observational data of past fires and first community meetings about forest fires were coordinated between Snowchange and peoples of Nelymnaya. We will share these first steps in the next years to prepare for future opportunities for addressing the fires, especially in the key wild reindeer habitats around the community.

The forest Yukaghir have developed a unique birch bark visual communications method over centuries. Yekaterina Surshannova, used with permission

The science teams in Snowchange and Russian academic institutions in Sakha-Yakutia produced alongside temperature data from 1925 onwards. This record of temperatures from the taiga region of Yakutia, (monitoring station in Chulman, southwest of Nelimnaya) points to the overall trend of mean temperature changes especially since 1990s that are a major driver of fires, increasing towards end of 2010s.

Chulman temperatures, analysis by Ph D Brie Van Dam, Snowchange based on the Russian Academy of Sciences data.



Alazeya and Kolymskaya

One of the most important communities in the work that was able to be carried out in the project were the Alazeya river area with the town of Andryushkino and the closest Kolyma Arctic river community of Kolymskaya. Both of these communities are located in the tundra, and some of the most remote human settlements in the world. The area is a hotspot for climate-driven changes.

Landscapes of the Kolyma region and reindeer herding.
Photo: Snowchange

The Chukchi and Tundra Yukaghir knowledge holders and monitoring teams were able to collect new information and establish some baselines from earlier community-led Indigenous knowledge of fires and change. Following community self-reflection, especially after the never-before-seen fires in the tundra in 2018, Elders and community representatives and Snowchange identified some of the past key events on the tundra and along the rivers to position the 2018 and aftermath of the fires into context.

Tundra fires are extremely harmful in the region as the reindeer herding especially in its nomadic form utilizes rivers and frozen lakes for movement in the late Autumn, winter and spring. Many communities are connected with ice roads and other seasonal cryosphere dependent transportation. Already warmer winters, loss of ice cover, unstable and sudden shifts in ice conditions and danger resulting from these changes causes direct human and animal losses, stress and hardships to many Indigenous communities. Tundra fires add a new and a dangerous element to the changes under way.

In short, the community of Andryushkino which was established in 1940. According to oral histories in the early parts of the settlement and construction history many nationalities lived in the village including for example Russians, Belorussians and Uzbeks. Soviet Union established pre-dominantly an Even village. There are five languages spoken in the village, including Russian, Sakha-Yakut, Even, Yukaghir (Vadul) and Chukchi. Some Evenki people live along the Alazeya river.

Officially the community has the status of rural national Yukaghir settlement "*Olerinsky Suktul*". Suktul refers to a 1998 regional governmental decision to provide Yukaghirs means of limited self-autonomy and governance of their homelands. According to 2018 census the population was 709, with people moving out of the village. The Yukaghir population in the community has developed in the past 50 years so that in

- 1970 there was 81 Yukaghir
- 1979 all in all 115 identified as Yukaghir
- 1989 200 people
- 2002 282 people
- 2010 248 people
- 2013 256 individuals
- 2018 181 of these residents identified as "Yukaghirs".

Central to the life of the community is the Alazeya River (in Sakha language Алаҕыай). Andryushkino village is located on the shore of the river. Alazeya is 1590 kilometers long with a catchment area of 64,700 square kilometres according to Russian sources.

Elder Matrena Nikolaevna Tokhtosova commented on the meaning of the river:

We like our Alazeya river a lot. It feeds us and we can use the boats to go where we want, even all the way to the sea. We give offerings to the river and ask that all summer will be ok. An Elder might collect some pearls and donate them to the Alazeya river which carries them someplace.

Many people in the oral history work referred to the "natural laws" and how nature itself governs the hunt and the availability of animals, fish and birds for game. Nature also punishes people who are overharvesting. Elders in Andryushkino also linked global events like tundra fires, world wars and droughts with the unavailability of animals and fish. They say that nature is responding and reacting to bad events.

Yukaghir knowledge of the tundra has been best preserved to date amongst the herding, hunting and fisheries. Elements of this knowledge in the navigation of reindeers, for example using the stars and the Big Dipper to tell the time during night. Sacred places on the tundra were respected and avoided as per guided by the Elders.

Reindeer herding is central for the food security for the region. Photo: Snowchange

Matrena Nikolaevna Tokhtosova conveys this deep knowledge in her oral history:

It is important to treat the fire so that it will not get angry. Once there lived a mean, mean person. He needed to migrate from one place to another and therefore he needed to put out his campfire. But he cleared a large area using the fire so that only the earth remained on that spot. He made a mess and used his axe to cut everything and then left. He arrived in a new place and started to make a fire. We were told this story. But the fire would not start. So he thought – ok, I ll return to my former campsite and take the fire from there. So he went back. But there was an old man, a grandfather who was covered in blood, hit with an axe. The man asked: 'Who did this to you?' The grandfather responded: 'You did when you chopped everything with your axe and left.' The man said: 'I went to my new place, but it seems I cannot light the fire there, so I wanted to get the fire from the old place. Grandfather replied: 'You will not find the fire here either, because this earth is now such a mess, you cut everything here. Now you will never see a fire again. You will not be able to cook. And you will not see fire ever again. The man went back to his camp and died without the fire.

Climate-change related overall observations from the oral histories as a baseline to position the 2018 tundra fires include that

- 1926 was an extremely warm year
- 1972 was an extremely warm year. Locals associate these with the leap years. Then over 1000 reindeer died of heat stress. Many animals like horses, reindeer and moose swam in Alazeya as it was so hot, but they died, mostly "because of the amount of mosquitoes".
- The people observed many sun spots in 1972 associated with this warmth.
- Similar horrible amount of mosquitoes killed animals in 1999-2000. Over 400 reindeer died in Berezovka (middle Kolyma).
- 2000-2005 were very warm. Alazeya was very low with water during this period.
- The "soil" is nowadays more melted.
- In the tundra there are many lakes that have disappeared. For example around Olera, the water "flowed out". (Melt event on the permafrost). This has affected the fishery as many good fishing lakes have disappeared.
- New birds, including waders, have appeared. Especially the "Japanese crane".
- Many Elders said that the winters have changed. For example in 1950s and 1960s it could easily be 60 degrees below. Now these temperatures do not happen anymore.
- in the upper parts of the basin where Sakha pastoralists have their villages, human-induced lake discharges exist. The purpose of these actions has been to acquire "more grasslands" for the animals. However this is partially attributed to natural erosion as opposed to human actions.

During the community workshops participants were asked to share their documentary and participatory materials regarding the new tundra fires. These smart phone images document the 2020 tundra fires on Kolyma. via Snowchange, 2022.

2007 flood

The last major event of transformative changes before the 2018 fires in the region was the 2007 flood. The causes and impacts of the Autumn 2007 flood event on the River Alazeya that affected the village and the basin.

The contextual reason for the major flood of 2007 on Alazeya results from the energy balance that has shifted in the Arctic because of climate change. This influences snow and ice events and the permafrost dynamics. This energy balance change also influences river discharges, lake formations and drainages and floods.

Scientific interpretation of the 2007 event (see Snowchange for science sources) can be summarized in short:

1. Very warm 2006 and large precipitation caused a large amount of water to enter into the Kolyma lowlands combined with waters from the permafrost melt areas. The deepening of the active layer of the permafrost affects the surface water amounts.
2. 2007 was another extremely warm year especially with the air temperatures with twice the speed and amount of warming in NE Siberia compared to the global averages, compared to the 1982-2015 mean.
3. The actual flood event took place between Svatai and Argahtah (upstream from Andryushkino) as a result of expansion and drainage of lakes and overflowing from these lakes when meltwaters entered the lakes and caused large amounts of water to travel downstream.
4. Thermal erosion of the river banks was the final trigger for the floods to break free and influence the downstream parts of the system.

The work that was able to happen in the Alazeya and Kolymskaya with the Chukchi and Yukaghir teams was able to convey a number of key steps:

- The Indigenous peoples of the region have a special relationship with the tundra, with fire and with the landscapes
- Many past events, unknown to large society, have already taken place, such as the earlier floods and lingering impacts of the 2007 flood on Alazeya, which link changes in tundra and fire results with the downstream impacts (affecting also food security and fisheries). They also take place in the context of temperatures soaring and permafrost being affected.
- Indigenous baselines should be established, including respectful relations with fire, to understand and position the new events of 2018 and after, and start to build early response and monitoring teams of Yukaghir and Chukchi.

The project in the region was able to be initiated. The Indigenous representatives from the Yukaghir expressed willingness to establish new teams to improve detection and response. Unfortunately this step is currently paused and awaits for the next window to happen.

Omolon

Omolon is a small Indigenous Chukchi community located in the Western Chukotka, Easternmost of the provinces of the Russian Federation. It is in the nexus of the tundra and northern parts of the boreal forests.

It is a novel and new region that is very concerned regarding tundra fires. Learning from the relatives and colleagues from Kolyma and Alazeya the reindeer herders expressed great willingness to establish early response teams and mechanisms as the fire regimes are also changing in Chukotka.

In late 2021 and January 2022 workshops were held amongst the reindeer herders. Key staff was interviewed and appointed to think where are the most important in terms of fire safety and where the food security is most threathened by these new fires.

Key staff of the Omolon monitoring team, Chukchi community.
Photo: Snowchange

Leader of the Omolon work, mr. Kaurgin.
Photo: Snowchange

Moving to the key reindeer pastures from Omolon.
Photo: Snowchange

Proposals for New Monitoring and Response Mechanism to Tundra Fires

The Snowchange work to address the novel, new tundra fires since 2018 was greatly advanced in late 2021 and early 2022 with the support from the Montpelier Foundation. The regions and communities of Nelymnaya, Alazeya and Kolymskaya and Omolon responded enthusiastically to the invitations to community workshops to reflect and review what could happen. We coordinated efforts in the regional capital of Sakha-Yakutia to support and build resilience of monitoring, early responses and solutions across the wide region of NE Siberia.

The War of February 2022 brought all of these actions to halt. The mobilization of reserves in September 2022 greatly affects the capacity of remote regions to respond to other issues as many males are being called to the war effort, often targeting Indigenous individuals.

In this Work Report we have learned of the growing threats of tundra fires and also the increasing worry in the community of Nelymnaya in the taiga zone. Temperature records from the region point to a significant and persistent trend from 1990s onwards bringing forwards more harmful fire regime.

Alazeya and Kolymskaya, located in the tundra zone, suffered from never-before-seen tundra fires from 2018 onwards. Participant photography provided evidence of how the fires were. Community-led workshops and existing Indigenous materials provided a baseline of several existing and past changes, especially in Alazeya, which the community people felt was an important positioning to understand the new fires. Additionally the Chukchi and the Yukaghir peoples also have a strong cultural understanding of fire and they stressed nature to respond to conflict and strife.

The small community of Omolon is in Western Chukotka. Parts of their traditional reindeer pastures and areas of food security are in the tundra and in great danger of the “new” fires, already affected in the Kolyma area. Workshops and early commitments for monitoring teams proceeded until the War to prepare for the 2022 fire season.

These community-led efforts point to key messages, when the window emerges, to continue these collaborations:

- It is very important to establish Indigenous knowledge – science baselines to understand the novel events and position them into a historic frame and scales
- Community-led teams for early detection, documentation and response are possible, communities are ready and need support and capacity as they are in the tundra in any case, know the landscapes and maintain nomadic lifestyles central to knowledge of ecosystem change
- Central coordination efforts in Yakutsk and regional centers are needed to be linked with the community teams and science institutions to provide an overall view of the 2023 fire season and beyond
- Satellite images and feed could be provided in near real-time to the central authorities and the community teams to track, in the event of fires, their progress and speed to avoid harm and protect the people and the animals

References

INDIGENOUS KNOWLEDGE MATERIALS

A. Community Workshops in Alazeya and Kolymskaya, Nelimnaya and Omolon, December 2021 to January 2022.
B. Oral history archives of the Alazeya Yukaghir peoples, available at Snowchange Cooperative

MEDIA SOURCES

Siberian Times. 2021. Zombie Fires Burn at -60C. Available at https://siberiantimes.com/other/others/news/zombie-fires-burn-at-60c-outside-oymyakon-the-worlds-coldest-permanently-inhabited-place/

A sacred tree from the boreal Yakutia. Snowchange, 2007