Hello everyone and welcome to Northern Lights, the Harvard Arctic Initiative Student Podcast.

‘Follow the science!’ It’s a phrase we have heard over and over again in the past year. But have you stopped to think about what it means, about what it means to know something and how we know it. It’s a question which has been being posed at least as far back as Aristotle, who wrestled with ideas about what science and knowledge are and one which is often answered with ideas of hypotheses, experiments, methodologies and papers.

But what if there were other types of knowledge or other ways of knowing. Is Western science the only way in which the world can be understood? Or are there other methods by which people understand the world from which we could also learn.

Today we have our third guest episode from the students of Harvard Kennedy School’s Policy and Social Innovation for the Changing Arctic course. Four students met with Anders Oskal, the Secretary General of the Association of World Reindeer Herders to discuss traditional indigenous knowledge and how it differs from, and can complement, Western scientific knowledge.
This is Allison Agsten, Lucy Montgomery, Emily Ostler and Nathan Huey with ‘Other Ways of Knowing’.

Allison Agsten
The Arctic is experiencing global warming more acutely than any other region on the planet. Chances are, if you know about the environmental changes in the region, you are considering them through the lens of science; for example, the rate at which surface air temperature is rising or the tons of net carbon released into the atmosphere due to permafrost thaw.

But what if there was another equally valuable but often overlooked perspective in understanding the Arctic and this moment of enormous change in that region?

Nathan Huey, a PhD candidate in the Department of Biostatistics at Harvard University, talks to Anders Oskal, a member of the Sami reindeer herding community in northern Norway, about an alternative—or better yet, a complement to Western science.

Nathan Huey
Hello, we have the pleasure today of speaking with Anders Oskal, the secretary general of the world reindeer herders, co-author of the IPCC Fifth Assessment Report, and a member of the Sami reindeer herding community, among many other activities and accomplishments.

Good morning.

Anders Oskal
Yes, good morning. Happy to be with you today.

Nathan Huey
With our conversation today, we'd like to provide an entry point for our listeners into the topic of traditional or indigenous knowledge and the important role it has in future solutions in different reindeer herding communities in the Arctic, especially in contrast to an approach based solely on Western science.
From other opportunities I've had to hear you speak on this topic, even defining indigenous knowledge seems to be in itself a kind of a slippery topic to grab hold of. Would you mind sort of explaining that a little bit to us right now?

**Anders Oskal**
Yes, well, there is, of course, no unified definition of the concept, and even the terms can vary a bit, and it's some talk about indigenous knowledge of traditional knowledge. There's traditional ecological knowledge and so on and so forth.

We, however, prefer to use the term traditional indigenous knowledge. And the way we understand this is that it is a systematic way of knowing based on close observations and close interdependence of natural systems over time. Another term is “traditional” and this can be perceived as old, perhaps outdated and so on. And while indeed much of our knowledge is very old, it's also revised continuously. So in other words, what works, you keep. What doesn't you don't, you discard.

**Nathan Huey**
These knowledge systems that you're describing, how do they differentiate themselves as ways of knowing from from science as understood in these Western and Western context?

**Anders Oskal**
And that's a wonderful question. And of course, as we see it, we are still talking about knowledge and our type of knowledge, our way of knowing our knowledge base is, of course, obtained in a different way.

It's stored in a different way and it's transferred in a different way, is obtained through observations of nature, a link to our high dependence on nature. It's stored not in books and hard drives, but it's stored basically inside the heads of those who are hunting around here.

And it's transferred differently, again, not through books and written codified information, but rather as oral form of oral transfer and also transfer through doing learning by doing, we could call
it. And it's also important to say that this knowledge, although in a different way, it's also tested as scientific knowledge. We were herding reindeer up north while science still thought the world was flat. So this is a knowledge that has been developed and works perfectly and uniquely in the Arctic and subarctic, barren and extreme environments.

Nathan Huey
Now, how large is the reindeer herding community today or the different groups of reindeer herding communities.

Anders Oskal
Well, today, we have reindeer herders spread across three continents, 10 national states in the northern hemisphere. So we have reindeer herding in Norway, Sweden, Finland, Russia, Mongolia, China, Inner Mongolia. We also have reindeer herding in Alaska, in northern Canada and Greenland and also in Scotland and reindeer herding today representing a wide diversity of cultures and knowledge bases, of course, belonging to a wide array of different language groups, meaning, of course, that we have also been separated from each other for a long, long time.

Of course, we can divide the reindeer herd mainly into two different types of herding. It's the tundra reindeer herding, which is found in the north, and Tyga reindeer herding, which is found in the more southern forested areas.

Nathan Huey
In your experience, to what extent is climate change an issue in regards to food security in reindeer herding communities today? And what role has traditional indigenous knowledge played thus far in adaptation to these changes?

Anders Oskal
We talk about, of course, the two degree target. But our recent studies also show that in the village where I am living today, well, the gain in Arctic Norway, we have not two degrees warming. The last 30 years, we've had three point seven degrees warming of our winter spring plus just for reindeer. And indeed, if we look further east to, for instance, the eastern Siberian coastline here,
studies show that there hasn't been two degrees warming, not three point seven, but six point two degrees warming. Nomadic societies, nomadic communities have many challenges, as is the real challenge is the combination of these drivers, where on the one hand, the climate is driving the they use new uses of the Arctic and it is also requesting reindeer to respond in certain ways to to extreme events and changes over time, of course, also.

And vegetation changes in the snow, in snow conditions and where land encroachments, fragmentation of pasturelands, disruption of migration routes and so on limit the geographical scope for adaptation of rain. This is, combined, a rather challenging picture. As for what role indigenous traditional knowledge has played this far? Well, first of all, we can safely conclude that this knowledge has played a vital role in that our societies are still not only existing and surviving, but thriving. And just to illustrate, one of our colleagues have published her piece in 2012.

She documented 318 terms for snow just in the Sami dialect spoken in the village where I live. Three hundred and eighteen terms for snow in use. What is more significant is that this, of course, represents a systematic and deep understanding of the natural environment and knowledge which has been and will be even more important to maintain our cultures and the unique way of life for the future.

**Nathan Huey**

How can there be a dialogue between indigenous traditional knowledge systems and science, which appears to be the preferred way of knowing?

**Anders Oskal**

I could quote my own grandfather, who, in response to a couple of my uncles, having introduced the idea of using GPS as a safety measure, responded that basically if there is no intuition, there is no Sami. And that perhaps illustrates the point we can use technology to help us, but all in all, we have to make use of our own traditional knowledge base and as my grandfather claimed, our intuition to be able to handle the environment in which we live.

**Nathan Huey**
How do you think moving forward, since there is so much potential for these for the dialogue between these two systems, how do we get scientists to appreciate the role that indigenous traditional knowledge has to play and its value moving forward?

**Anders Oskal**
To combine traditional indigenous knowledge and sciences is easier said than done. But as an example, we had in one of our previous research projects, meteorologists meet with reindeer herders on the topic of snow, snow change and snow physics.

And it was, I think, quite a revelation for these meteorologists and climate scientists to discover that these reindeer herders not only had knowledge about snow, but that they had knowledge about snow, which scientists weren't even close to understanding. And that really changed the dynamic, the dynamic of the discussions. And likewise, when reindeer herders were able to see through the graphs and statistics of these climate scientists to see their own situation, the snow conditions and remember back historical events and so on and so forth, that was also very giving.

So we sort of were able to create a space between these two very different groups and find some common grounds where they were able to communicate. Reindeer herders, of course, know some things about the areas in which we have lived, and much of this knowledge is yet to be discovered by the scientific community. So by working in this way, someone taking the transboundary role and by having and supporting and building transboundary institutions inside the indigenous communities, societies, we can make a step further in bridging these two knowledge systems, these two ways of knowing.

**Nathan Huey**
What does this mean for a general listener who's listening today; how should they view their responsibility or role and what can they do concretely to support positive change in the region?

**Anders Oskal**
I would invite everyone to make an effort to try to understand why and how changes are happening so fast on the homelands of our Arctic, indigenous, nomadic peoples. And to understand that there are multiple ways of knowing and be curious about this.

**Nathan Huey**

Anders Oskal, thank you so much for taking the time today, and it is always a pleasure to hear you to hear your expertise on these issues, which will certainly, you know, only take on more importance as time goes on.

So thank you once again.

**Allison Agsten**

This podcast was produced by Harvard graduate students Alison Axton, Nathan Huey, Lucy Montgomery and Emily Ostler.

Special thanks to our guest, Anders Oskal secretary general of the Association of World Reindeer Herders and executive director of the International Center for Reindeer Husbandry.

**Sarah Mackie**

Today’s episode was written and produced by Allison Agsten and Lucy Montgomery from Harvard Kennedy School, Emily Ostler from Harvard Divinity School and Nathan Huey from the Harvard School of Public Health.

We would like to thank Anders Oskal, the Secretary General of the Association of World Reindeer Herders for his time and his expertise.

This podcast was created as part of Harvard Kennedy School’s Policy and Social Innovation for the Changing Arctic course, taught by Halla Logadóttir.