Arctic Melting & Rising

https://www.climateone.org/audio/arctic-melting-rising
Recorded on September 23, 2015

Greg Dalton: I'm Greg Dalton and today on Climate One, we're talking about the Arctic and a warming world. President Obama's recent trip to the Arctic, the first for a sitting US President, shined the light on the vast wilderness and the indigenous people in Alaska. Now that the president the headlines have moved on, we'll discuss what's going on up north and why Americans in the lower 48 should care about a region few will visit and most of us know very little about. For starters, European merchandise Californians buy at the store may soon come through the Arctic rather than the Panama Canal. Drilling for oil and natural gas is moving forward and tourism and other economic opportunities are opening up. That's because the sea ice is melting at an alarming rate. We'll discuss all that and more over the next hour and take questions from our live audience here at the Commonwealth Club in San Francisco. We have four guests on the stage to share their insights on the new Arctic. William Collins is Director of the Climate and Ecosystem Science Division in Lawrence Berkeley National Laboratory. Alex Levinson is Executive Director of the Pacific Environment, an advocacy group focused on the Arctic. Sergey Petrov represents Russia as its Consul General in San Francisco and Hilde Skorpen, represents Norway as its Consul General in San Francisco. Please welcome them to Climate One.

[Applause]

Sergey Petrov, once not too long ago the Arctic was an area where Soviet and American bombers were flying around and it was an area of some military activity. President Obama went there recently as the first sitting President to go to the Arctic. What do you make of the symbolism and the importance of President Obama going up there?

Sergey Petrov: I would say that I wouldn't agree how you put this question.

[Laughing]

Because what we should do what the last thing we should do with the Arctic is to politicize it. So yes, there was, there were times that with some strategic games in the Arctic they passed and they hope they will not get back to that. And what we should do is put Arctic outside politics, be it foreign politics or internal politics of any country and to use seriously to work seriously on the challenges we have in this region. Because this region and we'll speak about that today is the regions that all the world depends on, be it climate, be it energy, be it level of the world ocean. So what we should do is to put this region outside any political games any due political games and to try to deal seriously with the challenges we see there today.

Greg Dalton: We will -- good point. We will come back to that. Hilde Skorpen, there's a new ocean at the top of the world and people are paying more attention; maybe some because the president went there, maybe because it's more in the news more. But how do you see this awareness of this new ocean at the top of the world. You've been living there a long time but Americans are just kind of newly discovering this place.

Hilde Skorpen: Yeah, well it's not really a new ocean the ocean has been there all the time.

[Laughs]

And it has been subject to the Law of the Sea. And we hear a lot people talking about sort of a scramble for resources. We don't think that is the case, most of the resources in the Arctic are found on the sea beds of national territory of the countries on the continental shelves. And very little is actually not subjected to the continental shelf deliberations that are now going on. Most countries in the Arctic have submitted their documentation for the outer limits of the continental shelf and to my knowledge is only 8% or 10% that is not part of that. And estimates of resources in the region holds that those, that is not the place where you find most of the resources.

Greg Dalton: So just to clarify, the further our country's continental shelf goes out they can basically claim, that's ours, right?

Hilde Skorpen: They can claim that it's ours but that is part of the convention on the sea, the UN convention on the Law of the Sea. And that is one a convention that all the Arctic states, all the states bordering the Arctic have committed themselves to observe. They have explicitly stated that they recognize the Law of the Sea and the convention of the Law of the Sea as the legal regime for this region.

Greg Dalton: Alex Levinson, is there a resource scramble going on in the Arctic?

Alex Levinson: Well, there is a resource scramble going on the continental shelves, Russia, Norway and the US are all looking at off shore oil drilling. And an oil disaster would be the single worst danger for the Arctic because it's a place everybody here remembers in the Gulf of Mexico the oil spill, the BP Deepwater Horizon were for nearly three months the oil gushed out. In the Arctic, if you drill and in the late summer pack ice is beginning to close in and then the darkness closes in and the ice closes in and you have an oil disaster, it could go on for the entire season, it could go on for a year. And it's in the conditions which with extremely delicate and fragile ecosystems that we even barely begin to understand.

Now there is also a new ocean emerging at the top of the world, it is an ocean that's been there before but it's had permanent sea ice. And the scientists are now telling us the sea ice as it recedes may be open as early they were saying 2050 then they were saying 2030. And I've seen some scientists say could even be open summer sea -- open summer oceans by about 2020. And the kind of resource scramble you'll have there will be shipping over the top of the world. The new Panama Canal, an Alaskan politician called it. And you'll also have fishing and potentially overfishing and there's more to say in that because the nations here have actually done an agreement to try to get ahead of that fishing issue.

Greg Dalton: So there's a lot up there. And I'd like to come back to Sergey Petrov, you talked about not politicizing the region. In 2007, I went up in the Arctic, my first time there, it was a global warming symposium with scientists. I went to Siberia and on a Russian icebreaker and that was the life changing trip that prompted me to found Climate One. And at the same time when I was up there, there were some divers that planted a Russian flag on the sea floor near the North Pole. Was that not a political act and a political statement?

[Laughs]

Sergey Petrov: Okay, so it's not a good habit to ask questions to answer the questions.

[Laughter]

But when an American astronaut planted the US flag in the moon, was it that the US claimed the territory of the moon? But, seriously I remember this moment, I was watching a movie, IMAX movie

you know the one? When it happened. And I start receiving calls on my cellphone and I was in charge of the Russian embassy in Ottawa at that time was, the ambassador was being on vacation back in Russia. And I started receiving these calls from the media and they're asking me to comment on what happened. And after that it was like two weeks of torture from government, politicians, media asking me to explain what happened. And what happened is very easy. We have two deep capsules, deep sea capsules that went down if I'm not mistaken to 2,200 meters to the bottom of the sea the North Pole. And they were not only Russians there by the way. It was, one was Australian and one was Swedish citizens, part of this international team. And yes, they did plant a symbolic thing, a Russian flag there because the most part of the science and technology were made by Russia.

And it was a symbol of Russia first being able to do something like that to reach the North Pole and to reach the bottom of the sea at the North Pole. And second, to as it happened on the moon, to show what our civilization can do. Hopefully we'll do it for the benefit of us, of all of us.

Greg Dalton: William Collins, most people never get to the sea floor to the Arctic. Why does the Arctic matter to people in the lower 48 and California, how does it affect our life, our weather, et cetera?

William Collins: The Arctic is home to one of the great land ice sheets on earth, the Greenland ice sheet. And we know that that sheet is beginning to lose water into the ocean which causes sea level rise. It's losing it more and more rapidly and this is going to come home to roost on coastlines around the world. Greenland is equal to about seven meters of sea level rise and --

Greg Dalton: Can you translate that for Americans, that's 21 feet.

William Collins: Sure. That's approximately 23 feet of sea level rise. And Antarctica is, I'm sorry I have to go south here for a minute, but Antarctica is ten times that. So you don't want to melt them it's the general rule of thumb here.

[Laughter]

Really not a good idea. And we know our satellites they can measure how much mass Greenland is losing every year. We can actually measure the gravitational pull of the Greenland ice sheet from space. And what we've been able to tell is that Greenland is losing 200 cubic kilometers of ice every year. So that's, the way this will show up is that increasingly the sea level rise which has been dominated just by the fact that the ocean when it's hot expands more and more sea level rise dominated by the melt from land glaciers and from Greenland.

There are a couple of other ways in which the Arctic affects life here in California and life in American West. There are about ten million square kilometers I'm sorry I'm going to be doing everything in metric, I'm a scientist so -- ten million square kilometers of frozen soil called permafrost leftover from the last glacial maximum. And that permafrost is a mixture of ice and soil, it contains a lot of carbon and when that soil thaws, it causes damage to infrastructure that's permanently kind of a local problem but it also releases carbon and methane into the earth's atmosphere and that acts to accelerate global warming. So one of our concerns and one of the things we've been monitoring recently is just how much additional greenhouse gas will be release into the atmosphere as this huge region of the north begins to fall. These are all measured, all these trends have been well documented and this is all happening real time. While certain politicians would have trouble seeing Russia from their home despite assertions to the contrary [laughter], one thing these politicians most definitely can see are what are known as drunken forests. So these are forests where the trees used to be, you know, straight upright are now tilting over because the root

balls that were anchored in frozen soil have gotten unglued because the soil is thawing. And Alaska is home to many, many drunken forests these days.

Greg Dalton: A lot going on up there. So Hilde Skorpen, the irony here is that burning fossil fuels is making the Arctic, changing it and also making it more accessible. So your country has been drilling up there for a long time, should they drill more, should you stop drilling what you're doing now, how are you approaching this contradiction?

Hilde Skorpen: Well yes, we have been drilling for 50 years now actually. We started drilling in the North Sea, we have moved gradually northwards. We have implemented the strictest environmental standards on our petroleum activity of any country in the world. Already in 1991 we imposed a carbon tax. We are the only country in Europe I know that is engaged in carbon capture and storage. And on three fields, we are depositing carbon in underground storage depots. And so that is -- it is very tight, strict emission standards. Flaring is not allowed and that has always been forbidden unless for safety reasons or at least from very early on. And flaring is a big problem that is one of the big sources of emission. We are very active in areas trying to mitigate the effects of emissions. First and foremost, I would say that getting good results at the climate confronts in Paris now is maybe the number one the most important thing we can do to have strong targets. Norway is following the targets of the EU there, we are -- our target is to cap emissions of carbon dioxide or greenhouse gases by 40% by 2030 relative to 1990 numbers. But we are also taking initiatives to -- for more binding cooperation on halting the short lived climate drivers like black carbon soot and so on.

I guess the unfortunate thing is that we are living in an energy starved world and we know that the fossil fuel is going to be a substantial part of the energy mix for years to come. We are investing more and more in research on a renewable energy and even our biggest oil company Statoil is involved in research on offshore wind, floating wind power and solar power and so on. So, international --

Greg Dalton: Let's get Sergey Petrov here. Should there be drilling in the Arctic, oil and gas drilling in the Arctic? It was a big fuss here in the United States President Obama opened up some leases to Shell Oil. The head of the International Energy Agency recently said that drilling for oil and gas in the Arctic is too difficult, too expensive at least in today's current oil markets. Is that something Russia sees as a big promise?

Sergey Petrov: First of all, I think that drilling in any place in the world be it Mexican Gulf or Arctic is dangerous; it's not if adequate precautions are not taken to be it safe and sound.

But if we speak about Arctic specifically, I think we as a civilization we do not have a choice right now just to stop drilling. We would be short of energy, I agree with Hilde. And so we should do it with extra caution. And I should mention here there's now the agreement we have for the Arctic. We have one of the agreement that was reached within the Arctic Council a couple of years ago is to prevent oil spills in Arctic. We don't have for example this kind of agreement for the rest of the world but we do have it for the Arctic.

And one more thing that I would, I should mention. Looking for resources and trying to get to the resources in the Arctic is still a goal, still a project in front of us. We have a good saying in Russian, we say [speaking in Russian], which in English would mean "To cut the skin off an unkilled bear." So actually resources that we are trying to calculate now 30%, 25% in the Arctic, they're still very difficult to get to with the modern technology, with the modern resources that we have, is very difficult. And probably it will take years and years before we can do something substantial there as we do in other parts of the world. And that stresses the importance of us being together in doing

something like that.

And Arctic Council is a good example of how the coastal states and all Arctic states are working together to ensure that we, what we do in the Arctic be it drilling, be it search and rescue, be it transportation, scientific exploration, all these should be within certain very well done and very well designed rules.

Greg Dalton: Sergey Petrov is the Russian consul general in San Francisco. We're talking about the Arctic at Climate One. Alex Levinson, isn't it inevitable that resource extraction happens in the Arctic? We are on an energy starved world and isn't it really a matter of managing what happens rather than there's really no way to stop it?

Alex Levinson: Well, to this California audience, Californians know that we're going to get off fossil fuels completely. And we're going to get off it quicker --

[Applause]

-- we're going to get off it quicker and faster than people think because we have to and we're going to do that. This reminds me of a -- if you think of the world as a car, a community in a car driving toward a cliff, and at first you didn't know you were going toward the cliff. But the scientists are all telling us you're heading for the cliff and we keep saying, the people in the car keep saying, "Can't help it we have to keep going toward that cliff, there's no other way around it." And I don't see us doing that.

And I want to say something particularly about the curse of oil and the curse of fossil fuels and how it distorts the conversation. Norway has been a real leader on this, on all kinds of things in terms of using the best standards. Norway has the largest sovereign wealth fund in the world. It's a nation of 5 million people it has the largest sovereign wealth fund in the world and it recently announced in the last year I believe it was that they would completely divest of any investments that are coal related. Norway deserves a huge cheer for that kind of leadership.

[Applause]

Now the money for that sovereign wealth fund of course came primarily from oil extraction but worse, the Norwegian government then subsidized a coal mine on the island of Svalbard in the Arctic region. And I don't mean to attack Norway here; oil and fossil fuels distort decision making but petrol states always do this. So my state of Alaska, my nation state of Alaska, the governor of Alaska right now, Governor Walker, who's not a conservative Republican which is what you typically expect from Alaska, he's an independent and as liberal a politician as you'll find in Alaska, when President Obama came up he said to Obama we need to get more natural gas into the pipeline, we need those revenues. Why do we need those revenues? Because we need to relocate our indigenous native Alaskan villages which are being flooded. They cost about 200 million to 300 million to relocate a village of about 300 or 400 people. We don't have the revenues unless we get that natural gas revenues so that we can pay to relocate the village that's being flooded because of the burning of fossil fuels, so we need to get that into the system, everybody get that?

So the problem is, is the petrol state and the curse of oil always traps us in this kind of strange dysfunctional decision making. We're gonna have to get our fossil fuels and doing it in the Arctic, a place that largely is undeveloped is the worst place to start drilling for new oil now or getting new coal.

[Applause]

Greg Dalton: Alex Levinson is the head of Pacific Environment an environmental organization focused on the Arctic. I want to go to our lightning round but first Sergey Petrov, Russia is a resource rich state natural gas, oil and gas, can you see a path away, are you trapped in an oil curse?

Sergey Petrov: We'll take the path that California took some times ago, technology. We're going to do that.

Greg Dalton: Technology will help. I want to go to our lighting rounds. This is a series of yes or no questions, quick paced for our audience here at Climate One today. Starting with William Collins, yes or no, yacht clubs will be built in the Arctic during the lifetime of people listening to this program?

William Collins: Yes.

Greg Dalton: Hilde Skorpen, going to see melting glaciers before they're all gone is a selfish act that doesn't respect future generation?

Hilde Skorpen: No.

Greg Dalton: Sergey Petrov, what is your favorite James Bond movie?

[Laughter]

Sergey Petrov: Dr. No.

[Laughter]

The old one.

Greg Dalton: The real one. I'm thinking maybe Goldfinger, that's a good one. And who's your favorite James Bond actor?

Sergey Petrov: Sean Connery.

Greg Dalton: Right. Hilde Skorpen, Vladimir Putin evokes characters in James Bond movies?

Hilde Skorpen: No comment.

[Laughter]

Greg Dalton: Alex Levinson, polar bears are poor symbols of climate disruption because most Americans will never see one and have no emotional attachment to them?

Alex Levinson: Obviously not.

Greg Dalton: Sergey Petrov, the exodus of Syrian refugees to Europe is partly fueled by climate disruption and drought?

Sergey Petrov: Yeah, I agree with Brookings Institute who made this conclusion recently.

Greg Dalton: A researcher at the University of California at Santa Barbara, Colin Kelley recently published a paper on that topic. Hilde Skorpen, a Syrian refugee recently rode a bicycle through Russia to Norway. Syrian refugee, bicycle, Russia, Norway, yes or no?

Hilde Skorpen: Yes.

Greg Dalton: Northern countries, also for Hilde Skorpen, Northern countries will see more climate refugees as the world heats up?

Hilde Skorpen: Yes.

Greg Dalton: Sergey Petrov, during our lifetime climate wars will be caused by stress on food, water and immigration systems?

Sergey Petrov: Yeah, I think so, yeah.

Greg Dalton: Alex Levinson, a warmer Arctic means that more people will be able to experience its natural wonders in person?

Alex Levinson: Yes.

Greg Dalton: William Collins, what the scientist, climate scientist James Hansen, who recently wrote an alarming article about sea level rise triggered by the melting Greenland ice sheet sometimes blurs a line between science and advocacy.

William Collins: Well, this is a tough question. I'm going to go with yes but you will find many colleagues who admire what he's done as well. So but I'm going with yes.

Greg Dalton: There's many other people that on this stage would say the same thing. Hilde Skorpen, Norway should leave most of its hydrocarbons in the ground?

Hilde Skorpen: Yes.

[Applause]

Greg Dalton: Ending with William Collins. Climate conscious people, all of us here and listening to this, are at risk of seeing a climate connection in every warm body of water, every freak storm and every heat wave even when that connection is not really there?

William Collins: I'm afraid the answer to that is yes.

Greg Dalton: I plead guilty to that. How did they do on our lighting round today at Climate One?

[Applause]

[Climate One Minute]

Announcer: *And now, here's a Climate One Minute.*

Does the Alaskan Arctic hold the next big oil bonanza? When Shell Oil president Marvin Odum visited Climate One just two years ago, he had high hopes for the area, despite some very public setbacks. When asked if drilling in the Arctic might be more difficult and expensive than they'd anticipated, Odum had this to say:

Marvin Odum: *So I never take it lightly is I think the most important thing that I can say to that question. But it's not something that we haven't done before. Off the north slope of Alaska, you have the Beauford Sea and Chukchi Sea. There's been about 30 wells drilled in the Beauford to this point in history, and we've drilled a number of those. There's been five wells that have been drilled*

in the Chukchi and we drilled four of those five. So it's not an unknown quantity from that perspective.

Now that, in no way is that an excuse for, you know, losing a drilling rig in the storm and having it run aground. That's a separate issue that we have to address and put some other marine transit elements in place to make sure that there's no chance of that happening again. So we don't take it lightly, but we do know how to do this, actually, to drill these wells.

Announcer: *That was Shell Oil president Marvin Odum in 2013. After spending over 7 billion dollars to drill in the region, Shell recently announced that it hasn't found enough oil to make it worthwhile, and is pulling the plug on its Alaskan operations. In a statement released September 28th, Odum called the outcome "clearly disappointing."*

Now, back to Greg Dalton and our live audience at the Commonwealth Club.

[End Climate One Minute]

Greg Dalton: We mentioned Paris; I want to come back to that. There's some big important climate negotiations happening in Paris later this year. US has a plan out there, most countries do. Sergey Petrov, what is Russia's plan and is it aggressive enough to join the leadership of other countries, US and China?

Sergey Petrov: To tell you frankly I don't know the exact numbers of the future Russian input that would be announced in Paris in December. But, definitely there will be one and it will be substantial because we are very much aware of changes happening in our world. And it's not just north getting warmer but we have many more other related things that are getting worse and worse. For example, if we speak about Russia, we never experienced tornados in Russia just ten years, twenty years ago. We never experienced ice in rain in Russia but it all happened recently, it's happening recently. So, it's not just global warming, it's just imbalance in our climate that is causing our climate to go to the extremes, be it very cold or flooding or droughts. So we're definitely aware of that, we should do something about that. And hopefully Paris will come up with a new Kyoto Protocol that will help us to leave with new targets and to be able to keep the warming down under 2 degree centigrade.

Greg Dalton: Alex Levinson, what's your hope for Paris? Is it going to be a real deal or is it going to be a half empty victory?

Alex Levinson: Well, I'm not going to predict but what I am going to say what my hope is that we'll continue the momentum that a number of nations have begun to build toward including certainly the biggest two emitters, US and China, forging that agreement a year or so ago. That was enormously powerful because even though both of those nations, each of those nations is not doing enough the trends are very important. And both of those nations were doing almost nothing and going the wrong way and each has made some turns toward doing things the right way. President Obama now has toward the end of his term we can say he's been the best climate president we've had. He's taken on all of the issues that, you know, the emissions come from buildings, they come from fossil fuels, they come from cars and transportation, that's also fossil fuel. So in each of those he's done things to regulate them while also his administration has done things to regulate them while also pushing out on the clean energy side as well efficiency, solar, wind and other sources and created the credibility to then make a deal with China. So we're going into Paris with at least the opportunity and the hope to make a big further step.

Greg Dalton: Hilde Skorpen, there was a time when a lot of the world looked for US leadership on

climate, it wasn't there. Does the US, is US now seen in Europe as a climate leader?

Hilde Skorpen: I think that President Obama is seen as a leader who really takes climate change seriously and want to achieve real results. The fact that he visited Alaska, we saw as a sign that US is taking its leadership of the Arctic Council and its climate commitment to the changes in the Arctic very seriously as well. So we welcome very much the leadership that Obama is, President Obama is taking also in the Arctic.

But I just wanted to add one thing and that is that when we're talking about the Arctic, I think that we have a tendency to think about this just sort of frozen desolate place that is completely inaccessible and we have a tendency to forget that people are living there. There are four million people living north of the Arctic Circle. For Norway, 10% of our population are north of the Arctic Circle, 30% of our territory. So we are, when we talk about the Arctic Norway, it is, it isn't an exotic place; it is a place where people live. We have universities there; we have built the foremost research facilities in Tromso and on Svalbard. I just want to mention that that is part of Norway, an archipelago which is really what the, where you have to go to find what we think about as Arctic conditions with melting of the ice and so on. And that has become a research station for scientists from all over the world. And doing very, very important research on the effects of climate change because there is so many things we don't know so we need to get the and really get the scientific data on the table.

Greg Dalton: Some people might say the Arctic warming has a good thing. Sergey Petrov, are there some Russians who say, yeah, we could use a little warmer in Siberia, it's not so bad this global warming thing right? There may be winter, there may be some area some people who see positive benefits and they don't see the negative, is that true?

Sergey Petrov: There are some, there sure some people like that and not just in Russia but I think it's a very irresponsible approach. Definitely what's happening each day it should be within our focused attention to prevent global warming from changing our planet. Because we don't know what will happen. And I would agree with Alex that one day we definitely should stop using fossil fuel altogether and the sooner we do that the better. The only thing that before we do that we should find other sources of energy and if our scientists, our technology people are good enough to do it quicker, then let's do it quicker and we should do that.

Greg Dalton: Sergey Petrov is consul general for Russia in San Francisco. Our other guests today at Climate One are Hilde Skorpen, the consul general for Norway, William Collins, senior scientist at Lawrence Berkeley National Laboratory and Alex Levinson, Executive Director of the Pacific Environment, Environmental Group. I'm Greg Dalton.

I'd like to ask each of you some bright spots here in terms of where some things have been some positive change before we have to hand out anti-depressants to the audience here. I want to ask you Hilde Skorpen, tell us about, there are some bright spots happening in the Arctic particularly the fish stocks.

Hilde Skorpen: Yes, the fish stock is a bright spot. And that is largely due to very good management and we have managed particularly the Arctic cod together with Russia since 1976 actually in a joint Russian-Norwegian fisheries commission. And that has been very, very fruitful cooperation. Other bright spots is that we have -- the most important thing to us is to keep the Arctic as a zone, as an area of peace and security and cooperation. And we, the states of the Arctic very much favor or work in favor of that. Cooperation is on everybody's agenda to further cooperation in this area so that's so important to us. So oil spill was mentioned, the Arctic Council has been the forum for two, where two binding, legally binding agreements have originated. One is

on the oil spill prevention and the other one is on search and rescue. So that is a bright spot that we have managed to keep the Arctic as a zone of cooperation.

And we have also great interest from countries from far away, observer countries. So countries are interested in what is happening in the Arctic because they are aware of the fact that they're going to all, we're all going to feel the consequences.

Greg Dalton: William Collins, bright spots in the Arctic as a scientist, do you see any other than melting ice?

William Collins: Well, I guess there are two bright spots. The first is that our ability to measure and understand how the system is changing is constantly improving. So there is a continued investment in really understanding the system as it changes. And the second is that there really is an international spirit now of cooperation on understanding how to mitigate climate change in the Arctic. I've participated in discussions and meetings led by the Arctic Council designed to figure out how to reduce the impact of fossil fuel consumption on the Arctic, understand the impacts, understand measures that could be taken to a slow the rate of change. So there is an international spirit of cooperation around preserving this really critical part of the planet, and I think that is a bright spot.

Greg Dalton: Alex Levinson, you had some interactions with the Coast Guard that resulted in a bright spot, tell us that.

Alex Levinson: The Coast Guard is an agency that's really not used to having public pressure the way the Environmental Protection agency is, or the US Fire Service. We found ourselves in a situation where there were a set of nations discussing how to create international protection for the Arctic waters, for ships essentially going to the Arctic. And Russia and a number of other nations were in favor of a ban on garbage dumping and the US was not. And the Coast Guard is the lead delegation; the different agencies have their delegation. So we did an action alert to our members and said right to Coast Guard and ask them why is the US not supporting a ban on garbage dumping when Russia, we actually mentioned Russia and other nations are supporting that.

And the Coast Guard called us pretty angrily and said, you know, what are you doing and because they're not used to that. And we said to them, you know, we really want to work with you, we think US ought to take the right position. The US did and there is a ban on garbage dumping.

And if I may, there are policy initiatives in the Arctic that are bright spots. There is a new set of regulations that protect marine mammals and marine species and communities from the anticipated increase in shipping traffic, it's called the Polar Code. It applies to Antarctica and the Arctic; all of the nations here in the US have all been signatories to it. It came out of a UN agency. Have they gone far enough? Not at all, because they still allow oil ships to carry and use heavy fuel oil which is really damaging. But it's a very important first step and I mentioned before the Arctic, five nations Canada, US, Norway, Russia and Denmark because of Greenland, did sign an agreement to put a moratorium on fishing in the high seas. Because each nation controls its territorial waters but all the other fishing nations of the world can go into the high seas and fish. China, Japan, Korea can all go into the middle of the Arctic and fish but these nations have signed an agreement to say let's put a moratorium on until we figure out and understand better the ecology and put a fisheries management system in place. So there are bright spots.

Greg Dalton: Alex Levinson, also there's some and many environmentalists are concerned about increasing militarization in the Arctic, if there's resources, there's need more military activity up there. Isn't that inevitable, isn't it natural that countries like Russia and others protect their

undefended borders and that military presence up there may be a good thing?

Alex Levinson: You know, the question I think really shows, there's really two visions of what can happen in the Arctic. One vision is nations act like they do elsewhere and you'll have tremendously increased shipping, you will have militarization issues and treaties and certainly Russia and the US and some of the European nations and China wanting to have their piece and making sure they're protecting their interests.

You'll have greatly increased fossil fuel mining both off shore oil and gas drilling and coal mining. And then we have fishing, overfishing and collapse of --Or the other vision is you treat it the way we treat Antarctica and the way we've try to treat the moon. And you try to internationalize it and treat it as a global common in a special unique global heritage. And the Polar Code I just mentioned does treat it, most of the global waters around the entire world are regulated by Law of the Sea but in addition to the Law of the Sea, a special set of regulations were put into the Arctic. So I think really the solution is to treat the Arctic as a unique, unusual part of global heritage and separated out from the normal rules, the way we do for Antarctica.

Greg Dalton: Sergey Petrov.

Sergey Petrov: Just to add, if I may. Melting Arctic is making it easier for people to access it and, okay there are bad people and good people in the world. And definitely there should be more dangers, more challenges for the states that live around the Arctic Ocean including Russia. And if we speak about Russia, Russia has the longest border with the Arctic Ocean, the longest coast of the Arctic Ocean. And it's mostly unpopulated land that is not protected by any border control or anything. So, it's quite natural to have some law enforcement military possibilities there that would be, would be there when we could have some challengers coming from the Arctic.

But doing that and every country living around the Arctic Ocean is doing that trying to protect its sovereign territory. But what we should do and that's exactly what we are doing now be it whether in the convention on the Law of the Sea, using this convention the UN convention on the Law of the Sea or using the forums like for like Arctic Council is to try to protect the Arctic from the challengers in a cooperative way, doing it together. And I think that is exactly the way we should do it in the future.

Greg Dalton: We're talking about the Arctic at Climate One, I'm Greg Dalton, let's go to our first question, welcome.

Female Participant: Hi, I was interested in the carbon tanking that Madam Skorpen said. But what about the permafrost releasing, melting and releasing all the methane is it possible to tank the methane and carbon from the permafrost?

Greg Dalton: William Collins.

William Collins: So the difficulty there is that you've got a very large source it's spread over ten million square kilometers.

So it's not -- the technology that's being used to stash carbon at the oil wells in Norway and we're experimenting here with that technology in the United States. That's our point source that's very easy to also you stash it directly underground, not possible with permafrost, I'm sorry. Once the carbon is emitted into the atmosphere, it's in the atmosphere. So it's best not to get it there in the first place.

Greg Dalton: Next question, welcome.

Male Participant: Hi there. The topic of Arctic observer states has come up a couple of times in the conversation. And I just wanted to hear from the perspective of Russia and Norway and others kind of what the role should be. The numbers have expanded and new players are coming in, I'm just curious what your thoughts are on how that dynamic should play out going forward?

Greg Dalton: Other players in the Arctic, Hilde Skorpen.

Hilde Skorpen: Yes, I mentioned well we have admitted in 2013, China was admitted as an observer to the Arctic Council. South Korea, Japan, India, several countries in Europe and Norway is also advocating the EU becoming observer to the Arctic Council. What we see is that countries on the other side of the globe so to speak recognize that what is happening in the Arctic doesn't stay in the Arctic to put it that way and it's going to affect them. And it's a bit what we have been speaking about earlier how is it going to affect the, their climate. How is a country like Singapore for instance going to be affected? Low lying island states, coastal areas in general and research is of course the Arctic Council started out as with emphasis on the environment and that has remained the major focus.

So, to other countries it is interesting and important for their own future and they also have something to contribute we believe.

Greg Dalton: Let's go to our next question, welcome to Climate One.

Carter Brooks: Carter Brooks, artist and philosopher of Climate Art. In his great book Arctic dreams Barry Lopez has a passage describing standing on the sea ice and the whole ecosystem of plankton feeding everything but he ends this paragraph with "And it gives me a place to stand on the ocean and wonder." So my question is as we lose the sea ice or the perennials or the permanent sea ice or the Greenland glaciers, what are we going to miss, what should be we witnessing now or learning from that aesthetically or otherwise?

Greg Dalton: Who'd like to take that? Alex Levinson.

Alex Levinson: I'll take it just to thank you for the question because of course it's natural that we're spending most of our time, I think as we should be talking about policy and science. But actually one of the things that moves me and certainly not what brought me into the environmental field, but now I'm hearing that the ice dependent creatures so, you're talking about big mammals like polar bears and walrus and probably some marine species whose interaction psychologically we don't understand. Imagine if you are a creature who lives on the ice, that's your ecology and the ice is disappearing, whether these creatures are going to make it is now an open question that scientists are trying to answer. And that then we'll have to try to put policy in and that brings us back to the policy and the science but there's an aesthetic moral and human aspect to what's happening there as well. And so I just thank you for the question.

Greg Dalton: There's been some haunting photographs going around recently of emaciated polar bears that's really striking, drives that home, our impact on some species out there.

Let's go to our next question. Welcome to Climate One.

Don Sorowski: Hi, I'm Don Sorowski and I'm with the US Environmental Protection Agency. And I know we have several work groups at EPA that are wrestling with issues related to Arctic. I'm wondering how much interaction there is between the Norwegian and Russian governments with the EPA work groups.

[Laughter]

Sergey Petrov: Interesting. What I should say, we are marking the fifth anniversary today, not today but this month, of Russia and Norway signing an agreement that established the border and eliminated any contested territories in the Arctic. And I'm not sure about Norway, Hilde will tell us, but Russia is the country that doesn't have any territorial claims to any neighbor in the Arctic. And as far as I know we are working very closely with Norway in terms of trying to use all the technological advances to protect and to make the extraction of gas and oil while we're still doing that safer and more responsible.

Hilde Skorpen: Yeah, and if I may just add. Just last week in fact Norway and Russia renewed its agreement on mutual notification in the case of nuclear accidents. And we have had cooperation; we have a joint commission in fact on nuclear issues.

And we have cooperated on cleaning up nuclear materials on the Kola Peninsula which is very close to the Norwegian border stemming from the time of the Cold War which has been very important to us of course and the region in general. And these are examples of cross border environmental challenges that we all have to tackle together.

Greg Dalton: Sure seems like the Arctic is a neighborhood where countries play nice together and get along and humans are kind of on some of their better behavior and I just hope that stays the case as more money is at stake. Welcome to Climate One, let's have our next question.

Wayne: Hi, my name is Wayne I'm a climate activist with 350.org. Alex, you brought up a metaphor that I've rolled around in my mind a lot that we're rushing over a cliff. I think of us as Wile E. Coyote civilization chasing the Road Runner which is fossil fuels and we're always chasing it. But climate change is a giant geological cliff that will last maybe a 100,000 years James Hansen has said. So I ask each of you up there to tell me, what would it take for you to recognize how serious this problem is and say, oh my God we have to stop digging up fossil fuels or we're going to go over that climate cliff and there ain't no tomorrow.

Greg Dalton: Sergey Petrov, you have children and grandchildren, do they factor in you thinking that --

Sergey Petrov: Yes, I'm sure that they will probably -- they not will probably but they should see the time that we are doing much better with climate and we are using less dangerous sources of energy and using mostly green sources of energy. Yes, we, I would be happy to see that and I'm sure that we will be able to reach that if we do it all collectively. Because every country doing separately would do nothing to change the situation, to reverse the trends, dangerous trends with the climate. We only can do it if we act collectively.

Greg Dalton: I'm going to twist this or push this further a little bit. Pope Francis' encyclical is one of the best things you can possibly read about climate. I don't recommend many climate books but that one is special, it's different. Alex Levinson, he's asking us, each of us to do things for our own dignity, for our own morality, not wait until someone else takes action. Not wait until Paris, not wait until the price on carbon, each of us for moral reasons today now. So I want to put that point on the question about what would it take for all of us to do more? Starting with Alex and we'll go down.

Alex Levinson: It's a great question and it's a hard question. And of course the answer is each one of us answers it for ourselves in terms of how we structure our own life, what kind of cars we drive or don't drive. What kind of life we live or don't live but then it needs more than that, right? It needs us to then say, you know, in what way am I going to go out there and get involved with 350.org, a terrific organization that's new and has really been a terrific communicator of the depth of the challenge. Or run for office, which I hope each of you who's clapped for us here today will

think about because we actually really need I think to take back the activism in our society so that we can make the difference.

Greg Dalton: William Collins, climate scientists or some of the great public intellectuals woke up the world on this issue. And I've interviewed a lot of great climate scientists who take a lot of personal attacks because of the work they do and yet they fly all over the world talking about climate science, and what huge carbon footprints.

William Collins: I was hoping you weren't going to go there.

[Laughter]

Greg Dalton: So what it's going to take -- back to, what it's going to take for climate scientists to say we're doing noble work but we're not getting on airplanes anymore?

William Collins: So there has been increasing emphasis and especially in Europe on having meetings that don't involve air travel. I think that's a particularly important trend. The climate community is certainly aware for example of the carbon commitment associated with these are all on some of our leading assessments like the IPCC report, very large carbon footprint I'm sorry to say.

Let me just bring this slightly close to the home. The University of California which I'm a member is in the process of running a report that will be issued next month to Governor Brown, also to Secretary Moniz, also to representatives from the United Nations, describing how the University of California is going to move to become carbon neutral in a very short timeframe. Part of that is going to involve a very serious look at air travel. And so, the university is going to commit -- commit very seriously to becoming carbon neutral and I think it's a huge and very positive step forward.

Also to come back to your question about what do we do about it. And I have the really the pleasure of teaching a lot of people early in life about these issues. And I think the primary thing that I'm trying to do is to tell them that this is not, it's both a challenge and it's the world's biggest opportunity. I mean you talk about the great generation, the Second World War, some of the greatest generations to come are in the future. So I think we should go forward with that spirit and we'll be and I think with that spirit, we can take this challenge on.

Greg Dalton: William Collins is a senior scientist at Lawrence Berkeley National Laboratory. Let's go to our next question in Climate One.

Female Participant: So as the polar ice is melting, it's changing the shape of the earth. What ramifications is that going to have?

William Collins: So there -- can I take the question on this. There's an important Greek that we have to mention right at this point named Archimedes. And so Archimedes dealt with the issue about what happens when an ice cube melts in a glass of ice. And it doesn't actually, the total volume of water doesn't change, the sea level doesn't rise. What does change the geometry of the earth, and certainly the geometry of the coastlines is to take all the ice that's currently sitting a kilometer or so above sea level and then dump that into the ocean.

So that's what happens when you take portions of Greenland, portions of Antarctica, melt them and then raise the sea level. That does change the geometry of the coastlines very appreciably. So, the impact of that will be, if you take a look at the United States for example, 50% of the population lives within a pretty short distance of the coastline. And those populations will be affected. There are many other nations if we think, now in terms of climate equity issues, many other countries population that are much less able to adapt because they don't have the wealth of the means that we

do, they'll be very directly affected by rising seas. And Bangladesh is a leading example. And so this issue around the Arctic quickly translates I think this is very important to remember into a climate equity issue. How do we ensure that all nations benefit from our efforts to mitigate and to adapt to climate change?

Greg Dalton: As we wrap up here, I want to ask each of you briefly; what gives you hope, Sergey Petrov? Very briefly, we've heard a lot of dark or doomed things here today. Lot of some opportunities, some real bright spots. What gives you hope Sergey?

Sergey Petrov: We are Homo sapiens, we are reasonable people and we should find ways out.

Greg Dalton: Okay, Alex Levinson.

Alex Levinson: What gives me hope is that in the US we've had a very successful campaign among activists and many others to begin to really get us off coal as a major fossil fuel. And that made me think, wow, this we really can -- if the US can do this and finish the job with that kind of leadership and there's a long way to go but that, we're on the right track.

Greg Dalton: We've had some good wins. Hilde Skorpen.

Hilde Skorpen: That we are more and more seeing this as a win-win. And that we recognize that we have to cooperate, we don't have a choice.

Greg Dalton: William Collins.

William Collins: We can produce as much energy as we need from renewable resources, that's what gives me hope.

Greg Dalton: We've been talking about the Arctic and climate change at Climate One with our guests. William Collins, a senior scientist with the Lawrence Berkeley National Laboratory. Alex Levinson, Executive Director of Pacific Environment. Sergey Petrov, Consul General for Russia in San Francisco and Hilde Skorpen, Consul General for Norway. I'm Greg Dalton. You can listen to a podcast of this on the Climate One website, climateone.org and view videos. I'd like to thank our audience here in the room and online and on-air for joining us and we hope to see you again at Climate One. Thank you.

[Applause]