U.S. Forest Service's New National Climate Change Research Strategy and Framework

Media Briefing with:
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Dr. Jim Reaves – Director, Southern Research Station, U.S. Forest Service

Moderator: Stevin Westcott
October 16, 2008
9:00 am CT

Coordinator: Welcome and thank you for standing by. At this time, all participants are in a listen-only mode. After the presentation, we will conduct a question and answer session. To ask a question, you may press star 1. I would now like to turn the meeting over to your host of today's conference, Mr. Stevin Westcott. Sir, you may begin.

Stevin Westcott: Well hello everyone. Welcome to today's media briefing on the Forest Service's new climate change, research framework and strategy. I'm Stevin Westcott, Press Officer with the Southern Research Station.

Joining me today are Ann Bartuska, Deputy Chief for Research and Development. She oversees Forest Service research and development nationwide. And Jim Reaves, Director of the Southern Research Station right here in Asheville, North Carolina. He oversees Forest Service R&D here in the 13 Southern states.

First Dr. Bartuska and Dr. Reaves will discuss the new framework, then comment on the 100th anniversary of experimental forests in the United States. They will respond to questions at the end of the discussion. At the time that we open it up to questions, you can press star 1 to ask a question.

And with no further adieu, I give you to Dr. Bartuska.

Ann Bartuska: Thank you, Stevin, and good morning everyone. It's a pleasure to be here in Western North Carolina and be able to talk to you about this important topic. The Forest Service has a mission of caring for the land and serving people.

And within the context of climate change, we're seeing that mission of our ability to achieve sustainability and to help promote the needs of our forests is compromised. I think the challenges associated with that are how can we address this important issue, and how can we respond to the changing climate that we're facing?

The good news is that about 40 years ago, Forest Service research began a climate change science program that provided a basis for being able to make management decisions around the issue now on states. Because of that, the Agency has developed a strategic framework for responding to climate change, that we believe is going to be able to help our managers and our scientists make progress in dealing with this issue.

In particular, it will help us work with the National Forest System to take positive action. It will allow us to work with our partners and other cooperators on how we provide technical assistance. It will also provide a framework for our scientists in assistance in the future.

The three key elements of the climate change framework have to do with adaptation -- specifically how do we adjust our management practices to a changing climate, but also how do we adjust our processes to a very dynamic system?

The second is in mitigation. How do we respond to a continuation of greenhouse gas emissions both by reducing those emissions, but also to address the issues of carbon sequestration through the use of trees, forests and forest ecosystem. And the last is sustainable operations and how we respond to being more energy efficient, and reducing our environmental footprint.

Again, I want to state that our ability to respond in this way is because we have 20 years of research to back it up. But also we're building upon 100 year legacy of experimental watershed. And I'll mention a little bit more on that later.

I do want to say a brief word about the three parts of our climate change framework, just to give a little flavor on what we're talking about. With regard to adaptation of the IPCC -- which is sort of the definitive authority right now on climate change -- addresses adaptation and adjustments in natural and human systems to be able to respond to climatic variability and (tests).

And so our role in that is -- as prudent managers of the National Forests -- is to be able to look down the road at how we can anticipate those changes, what would that look like in terms of our actual practices. Classically that means how do we change our forest management practices in the face of changing rainfall patters, changing weather patterns?

How do we deal with species migration where we may be moving species at the edge of their range? We have high degree of value in endangered species. What will that do for the populations of those species? So quite a few questions associated with how we actually do management of our national forests and provide support to private land owners and state forest land owners.

So some of these measures then will require us changing our processes. We see climate change being built into our foreign plans which is a huge step for us. That's the fundamental basis for national forests are managed. We're changing our NEPA guidelines to deal with climate change, which again is a very important step.

And we're really looking at all the operational tools that we have to build our climate change scenario. One of the more recent examples is a foreign vegetation model that allows us to measure and adjust changes in forest management practices using input on climate change. And it's one of the backbones of our toolbox.

We're also going to be continuing to implement monitoring protocols that allow us to look at certain climate change signatures, what's changing our vegetation processes, water quality and all the other variables we have on forests in the United States.

For mitigation when we're talking about our role in mitigation, we see several different opportunities. One has to do with how we manage carbon -- managing carbon from the standpoint of increases because of energy use. So how do we use that to energy footprint?

How do we adjust our -- take opportunities with regard to biomass use for energy, which is a renewable fuel and can actually be managed to be carbon-neutral, but also the important role that forests play in sequestering carbon. Forests will be an essential part of carbon management in the future. We believe that by effective and efficient forest management on all forest lands that we can address carbon sequestration in a very intensive way.

But we also have a lot of vehicles out there. We have a lot of facilities. And I think we can actually reduce our carbon - our energy footprint and our environmental footprint by just doing more common sense approaches to energy management. And that's the basis of our sustainable operations piece -- the third leg of the framework.

In a sustainable operation, we're seriously looking at and beginning to input on energy efficient strategies, where we can use biomass from local management opportunities where be it fuel production for example to manage fire. We can take some of that material and move it into an energy source. And we're doing that on a site by site basis. And we're increasing energy efficiency use of our facilities. We're looking at green energy for our vehicle fleet, which I think is around 20,000 vehicles right now. But we're also promoting in our research program wood to energy and biofuel, and how we can take the fair (optic) approach -- basically the material that is part of trees and put it into more of a biofuel context.

So a lot of opportunities there. Again, I think build upon the strong science that we have is creating the scientific basis for management actions that we take. I'd like to turn it over to Dr. Jim Reaves to talk about some local effects that -- local efforts they are doing.

Jim Reaves: Good morning. Thank you for this opportunity. The mission of the Southern Research Station is to create the science and technology needed, to sustain and enhance southern forest ecosystems and the benefits that they provide. And climate change fits under that mission.

At the Southern Research Station, we are doing a substantial amount of research dedicated to understanding and mitigating those effects of climate change on our forests through the South. Our research are working with universities, industry, non-profit organizations and other government agencies and laboratories to conduct bioscience, that will help managers understand and deal with this effects of climate change.

Through these numerous projects, the Southern Station is helping to implement for us the National Strategy for Climate Change on the RFP. We are located in 13 southern states. And all of our science -- most of our science is done on alternate services that relate to climate change.

We're working on carbon storage and genetics. We're working on water modeling. We're working on wildlife, forest services. And we have what we call our Eastern Forest Assessment Center who is working really closely with NASA to look at various efforts in climate change.

I'd like to give a few examples of what we're doing in the Southern Research Station. In our North Carolina lab in Durham, our researchers are looking at the increase in levels of carbon dioxide on the loblolly pine.

As you well know, loblolly pine is a senior species in the South that we make a lot of our paper out of. And a lot of timber comes from loblolly pine. The research we do will help us to understand and effect the climate change and how we manage our forested areas.

Another example is our research done in South Carolina down in Charleston, in what we call Turkey Creek in the watershed of Charleston. And you well know that the watershed helps filtrate water into our water system and that by studying climate change, we can understand effects on our watershed throughout the South and throughout the country.

We have a genetic component down in Mississippi that we're working on, looking at the genetics of loblolly pine and other pines such as longleaf pines. We're mapping some of the genomes to look at what it does to plant in various areas.

For example, after the hurricane came through -- Hurricane Ike -- it was found that loblolly pine is this -- I'm sorry -- longleaf pines is that planted back to in these disturbed areas. Because during the hurricane, we found that there's less breakage and less (unintelligible) occurred in loblolly pine.

So we're looking at the various genetic families through genetic research. And because we didn't have a lot of the lab in the climate change arena, we're looking at how climate change is impacting stand dynamics as well as water.

For example with warmer time temperatures, the hemlock is being lost due to the invasion of the hemlock woolly adelgid. So how does that then affect water and water quality and quantity? It also impacts insects -- I'm sorry. It also impacts wildlife issues.

Except the more trees the more hemlocks that are lost from our increasing temperatures, and increasing amount of hemlock woolly adelgid affect the temperature of water. So you could subsequently get a difference in the

species of the insects -- affects, I'm sorry. Bogs -- it affects a number of things in the water - streams.

What you have to realize is all of this is integrated together, so you can't delineate separately what climate -- the impact of climate change. And now in Mississippi we're looking at the impact of climate change on frogs and how they breed. In other places we're looking at how climate change impacts wildlife such as birds and other mammals.

So as we move -- as our researchers look at this, we have integrate our research across different disciplines. We have the genetics. We have chemists. We have (unintelligible). And I can go on and on. But what I wanted -- the point I want to get across here it's an integrated process that we have to work through.

Stevin Westcott: Thank you sir. Tthank you. And now Dr. Bartuska will comment on the 100th anniversary of experimental forests here in the United States.

Ann Bartuska: Thank you. Be our pleasure to do that. In fact, I'm going to just go back a little bit to the climate change piece, because I mentioned a couple times that the basis for our ability to respond to climate change is our long term data sets.

There are two that we believe are premier in the nation. One is the Forest Inventory and Analysis Program at 80 years old which is really the nation's forest census. So even pre-dating the Forest Inventory Program is the establishment of our very first experimental watershed.

It happened in 1908 -- August in Fort Valley, Arizona. That site was established. In fact, the quote given at the time was, "With this tree, we plant

the seed of research." That was Gus Pearson, who established that particular experimental watershed.

But the goal was to restore the forest of the Southwest. And from that initial experimental forests have been established a set of 80 experimental forests and ranges, that I believe are a national treasure and one of our legacies to the American people.

All the way back to the Fort Valley -- or starting with the Fort Valley establishment through the 1911 establishment of Creek River in Idaho where they have daily weather records since 1911. To more recent times in the '30s with the establishment of Coweeta and Bent Creek here in western North Carolina -- that became the basis for fundamental understanding of how forests and watersheds produce clean water in support of the Appalachians.

To our most recent site on the big island of Hawaii, which was just established last year to support the restoration of the layer Hawaiian high elevation forest on state land. We have created a system that allows us to understand how far our contributing to clean water, to clean air, to wildlife habitat, but also how you can actively manage these sites to produce multiple benefits.

And that ability to look not only across time -- which is invaluable especially dealing with some of the issues we have now -- but also across space. So Coweeta and Bent Creek as individual sites are powerful because we have a long legacy of understanding how forests function.

So when you tie those North Carolina sites together with a photo in West Virginia with the Kane Experimental Forest in western Pennsylvania, all the way up to Hubbard Brook in New Hampshire and then the Penobscot in Maine, you have a back -- along the backbone of the Appalachians a series of

sites. They allow you to get at the fundamental principles of forests -- of processes of forest growth.

This is an incredible legacy for us as scientists. But more importantly I think it also contributes to very strong science-based management principles. And that's what they're all about. So as we are celebrating 100 years of the experimental forest and range system, we have opportunities now to move that system into the 21st century approach of research.

Climate change is I think just one of many complex problems that will take advantage of this network. This is a network that really ranges from sea level to 12,000 feet in elevation, from Alaska to Hawaii, Puerto Rico to Maine and many places in between. It really gives us a flexibility to look across sites, across dimensions and get at the fundamental understanding of these systems.

We really value the cooperation we have with many universities and working on these sites. We have some very strong partnerships in these locations. And we hope to build upon that. But we've also in placed a (CFA) as an outdoor classroom, of where they started as management -- a place to understand management processes.

We now move into places where managers can be educated, but also school children can be educated. And increasingly we have elementary, middle schools, high schools and colleges coming out on field days to really see what is going on in these national forests -- in these experimental forests. And you just have to look at Bent Creek often to see the use that some of these sites are getting.

In this location, the number of -- in fact I was just down there. I was just out on Bent Creek earlier this week. And the number of bikers that are out there

really are a function of the fact that we understand more how to create a system of forest roads and trails that bikers can use.

And there is a direct -- and it is not by happenstance that we have premier biking territory in this part of the world. It's that science has created a system that allows us to manage these sites and run more effectively.

So it's a celebration. It's a celebration of a legacy. But it's also an opportunity to move us into the 21st century in a very significant way, dealing with some complex science and management questions. And I for one am very pleased to be part of this whole enterprise. Thank you. And I believe Dr. Reaves, you have a few comments yet on the local conditions.

Jim Reaves: In the Southern Research Station we have -- we are proud to have 19 of those experimental forests right in the Southern Station. And at the Harrison Experimental Forest in Mississippi is some of the first research done on the silviculture and genetics of loblolly pine. Research now is the basis for growing loblolly pine.

The effort that we put forth on experimental forests is (unintelligible) the long term data sets that we are proud to have. These long term data sets can be mined for a number of other types of research that we do around the country. It's imperative that our audience knows that in the natural resources that -- and the long term data sets that allow us to look at long term trends and not make -- and make better policy decisions.

We have experimental forests that are -- most of our experimental forests are on national forest land. However, we have one of our experimental forests is on private land that we're working to look at different parts -- looking at longleaf restoration.

So if we look and use these -- utilize the experimental forests, we are continuing to include the university. We are continuing to include non-government organizations. We are continuing to include states and local entities to help us as we decide how we're going to use these forests and what kind of research we want to do on the forest.

Down in Arkansas, we have an experimental forest. It's the forest that much of the silvicultural practices of pine are based on in the East. So we utilize the University of Arkansas to help us as we engage in this research.

So we are proud that the Southern Research Station has a long list. In Bent Creek right here in our own backyard -- this year it is 83 years old. And we've been collecting data on that for 83 years. You know, that is the power of that data as we start to make policy decisions years out. So our scientists are proud. We're working hard to maintain these experimental forests.

Stevin Westcott: Thank you. We will now take questions from reporters. Reporters who may be on the line, please press star 1 I believe it is to ask a question. And please state your name and affiliation. And I think the operator'll help punch you through with if we have any there, or we can have a question from Nanci Bompey who's here from the Asheville Citizen Times.

Nanci Bompey: Sure. Can you really fixate on a little bit on the collaboration that...

Jim Reaves: Yes.

Nanci Bompey: ...is being done here in western North Carolina in Asheville between, you know, the universities or I mean you have the National Climatic Data Center.

You need a compilation of them on any -- specifically on this climate research.

Jim Reaves: Yes. We're working with a university -- North Carolina at Asheville here in our environmental threat assessment. Some of the modeling that we're doing from the practice over there, we're working Dr. Danny Lee and looking at and trying to forecast some of the events that will happen down the road.

That's also tied in with NASA through the assessment center, and some of the modeling capabilities that they have to handle large data sets and large amounts of -- analyze these large amounts of data. It's very important.

We have a strong relationship with the University of Asheville, the University of Tennessee. Some of the work we've done in hardwood restoration and some with North Carolina State in the area of hardwood regeneration. At Bent Creek, we have workshops -- silvicultural workshops. And they've been a mainstay of understanding growing of hardwood for many years.

And we had to turn back folks who want to come to that workshop because of the success of that workshop, and the (unintelligible) that would have field trips. And people go out and look at the restoration of oak. Oak is hardest to restore. So those are some of the collaborations especially with state agencies. They send all of their -- not all. But every year they try to get forces to that workshop.

Stevin Westcott: Okay. Operator, do we have any questions from the telephone?

Coordinator: Once again to ask a question from the phone lines, please press star 1.

Stevin Westcott: Okay.

((Crosstalk))

Coordinator: There are no questions at this time.

Stevin Westcott: Okay. Sounds like everybody has said what they needed unless Nanci, do you have any questions?

((Crosstalk))

Nanci Bompey: Maybe just one more question. I wanted to know how -- when this research is going to change the forest planning that you guys do. And I mean when -- is that already happening in your climate researching team, you know, working to keep forest plans? I mean it's nothing you can find with other plans here in western North Carolina. Or is that something that you'll get to see?

Ann Bartuska: Well I'm actually not sure where the forest plans office is in the North Carolina forest. I think the way we're approaching is those that already have plans in place -- which there are some -- will either have an amendment or will have some additional direction and guidance to the forest, on how they might address adaptation strategies and mitigation strategies.

And some of the tools that research has provided -- for example, give them -- there are questions of where do you put your priorities in terms of addressing adaptation. There's a triage system that one of our scientists from Rocky Mountain Station had developed for the western forests that has brought applicability. So we're trying to import that to the eastern forests.

There are also guidelines with regard to NEPA that are being evaluated right now. And that will go into effect as quickly as we can get the reviews done

and then build them to the process. And that would come out informally as a letter of guidance from the national headquarters. So we're, you know, we're trying to be adaptable in the planning process. But we like to know that there is some way to (unintelligible) with that?

Jim Reaves: In Mississippi, you know, working with the region to implement some of the research in climate change and some of the (unintelligible). They are just starting to (unintelligible) for the plan now. And it's the research that we -- the information we provided them from the -- after the hurricane about what to plant back and what to expect. It's very important. It's a science who -- as they go through their forest plan.

Stevin Westcott: Okay.

Coordinator: We have questions from the phone line. Becky Johnson of Smokey Mountain News, you may ask your question.

Becky Johnson: Hey, yes. I was just wondering if you could just take a couple minutes to elaborate on some of the specific impacts on the forests from climate change. Like for example, are we going to see increased invasives?

You talked about habitat, like the Northern Carolina flying squirrel for example being pushed off of its mountain top that it's living on, the lack of rainfall -- what that's going to do to timber -- if you could just give a few specific examples of some things like that.

Jim Reaves: I could start.

Ann Bartuska: Okay.

Jim Reaves: The climate change has an impact on hemlock. Hemlock -- there are 49 gallons. Each large tree of hemlock produces 49 gallons of water a day through respiration. If those trees are no longer there, that respiration -- the water is not -- transpiration, I'm sorry. Excuse me -- transpiration.

If those trees are not there, then that water goes back down into the soil. And when the water goes back down into the soil, then the net impact stream -- where the water runs into the stream, and once you get more water into the stream it helps -- it changes the water temperature which then impacts fishes. Small degrees of temperature will impact different types of fishes in the ecosystem.

Also that climate change will likely have an impact on the increase of hemlock woolly adelgid. The warmer it gets the more prevalent hemlock woolly adelgid is. So you're going to have an increase in the value of hemlock.

And hemlock is a species that we will likely not replace, you know, in our mountain ecosystem with the devastation of hemlock woolly adelgid. So that's one example of how -- specific example of how climate change impacts forest ecosystems.

Becky Johnson: Can you still hear me?

Jim Reaves: Yes.

Becky Johnson: Okay. I guess hemlock qualities are the best poster because a lot of people would say we were going to lose those anyway. And while climate change could exacerbate the impact of the hemlock woolly adelgid, you know, it

might have just been like five year, you know, five years later. We still would have lost them. Is there any other species that you could cite?

Ann Bartuska: Well just I think -- and this is Ann Bartuska. In a general sense, the fact that we are going to have part of the climate change scenario is that you have greater variability in rainfall and temperatures -- a greater fluctuation. And those species that are shallow rooted, are going to be ones that will be disproportionally affected by the amount of rainfall not being able to -- not having sufficient rainfall so that they will drop out of the system earlier.

Some dry sites will get drier. That will have some ripple effects in terms of overall species adversity. Now I think one of the other issues that we are very concerned about is what happens to insect population. The bark beetle epidemic in the western U.S. is clearly tied to a climate change signature where you had drought conditions.

With exacerbated temperature elevations, you're getting more populations of beetles. So you're getting a greater impact on the forest. Will that also swing out in the eastern United States in some locations is certainly a possibility, especially with regards to southern pine beetle which is a more most a local endemic.

You also asked about invasive species that while the jury is out on specific species, we know that invasives in general have a broader tolerance to climatic factors, and therefore are likely to be able to get established and spread and take advantage of the variability more than native species, which tend to be very -- have a narrower climatic zone in which they function.

So we are anticipating I think increased invasive - invasibility of species as well as the -- if you've seen them on the recent reports on poison ivy, I'm

sorry to say that (unintelligible) is such that impacts CO2 increase as well, increase the virulency of poison ivy. So for those of you who are concerned about it, it will enhance that. So we know that we're going to be seeing some of these changes taking place.

Just want to get back to Dr. Reaves' comment about water. And the important thing that we're looking at is that 53 -- we know that 53% of America's drinking water supply comes off the forests of the United States, not just national forests but all forests.

So as forest structure is changed just as Jim pointed out, then the likelihood that water quality and quantity will change is almost a given. And so we need to be able to better link what those signature changes are, and be able to anticipate downstream water effects.

And since many of our watersheds are then headwaters of America's drinking water supply including western North Carolina, this is an area that is I think a real marriage to better understand what is happening specifically in those areas.

Becky Johnson: Okay. And you know what? I have one more question if you guys can still hear me.

Stevin Westcott: Yes.

Jim Reaves: Yes.

Becky Johnson: Okay. So in terms of the forest management policy responses, I didn't know if you could give a couple examples of that because, you know, like I don't

understand I guess what you all could do from the management perspective to help with any of these things.

Are you more looking at how to deal with them or how to combat them? Like what would you do, you know, if you're concerned about watersheds, would you do fewer timbers sales since we're possibly going to be seeing the loss of some of the forests from climate change or what?

Ann Bartuska: Well I'm not -- let me give you an example -- well at least one of the approaches that we're taking. Forest planning is the tool that a forest uses -- a national forest uses to set its goals and objectives for the next five to ten years. Forest plans include scenarios and basically identifies what are the things that -- what are the functions and resources one wants to achieve through the management of that particular national forest.

So now in the suite of options that a forest is looking at is what are the impacts of climate change on their ability to produce that particular variable? It may be recreation. And it may be that in fact a particular forest is a recreation forest, has a lot of water use because of canoers, boaters, etc.

So then one of the scenarios would be would the map of water availability change under a climate change scenario, and therefore what would be the management guidance one would use in that particular situation?

With regard to fire management, we know that we have fuel for the -- we have a fire management plan that's associated with the National Forest Management Plan. Fire management is driven by wood on the forest. If you have increased fuel projected because of climatic change, and the (unintelligible) has been identified through models in a lot of the western

forests, then you would be shifting your field reduction activities to anticipate that increased fire frequency or fire occurrence.

And so on some of those forests it may mean that you're managing a watershed with some additional fuel production projects. That may include timber sales. But it's hard to know unless I knew the exact specifics. But it also in some cases the management of a forest is determined by having a particular set of species.

And a question may be for an endangered species, where there's a close relationship between species composition and vegetation. If you are going to lose a particular type of vegetation like hemlock, then you're going to lose other -- like in what Dr. Reaves was talking about -- you're going to lose other species.

How are you going adjust your management to address that particular species loss? So I think the fundamental basis of this is looking at these different scenarios and laying the scenarios out as part of the forest planning process.

I guess the last comment I'd make -- and I'm probably adding more things than you need on this -- but you have to be adaptive. And what we are struggling with I believe is this linkage between science and management in a frequency -- a temporal in short enough time that you can make management action based on new science and new information.

And that means that you can't just put something in place and (unintelligible) ten years it's going to be static. We are going to be living in a very dynamic system and a very unstable system. And so how do you provide the tools to a manager to be flexible?

And how do we as scientists make sure we're providing information quick enough so that managers can make a decision? So managing under adaptive climate is going to be a real challenge I believe to us.

Stevin Westcott: Very good. Well I'd like to thank Dr. Bartuska and Dr. Reaves for joining us today. If you'd like to receive information about the new climate change framework or other research station research, send me an e-mail at swestcott@fs.fed.us. And I'll send you the material. Thank you everyone for joining us today.

Jim Reaves: Thank you.

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