TRANSCRIPT OF PANEL FIVE OF THE AFTER IRENE SYMPOSIUM ON CREATING A MORE RESILIENT VERMONT

Moderator: Rebecca Purdom, Assistant Dean for Environmental Law Programs

Panelists:

Bob Irvin, President, American Rivers

Deb Markowitz, Secretary, Vermont Agency of Natural Resources

David K. Mears, Commissioner, Vermont Department of Environmental Conservation

Joe Segale, Policy and Planning Manager, Policy Planning and Intermodal Development, Vermont Agency of Transportation

Brian Shupe, Executive Director, Vermont Natural Resources Council

INTRODUCTION

On April 20, 2012, the *Vermont Journal of Environmental Law*, the Northern England Chapter of the American Planning Association, and the VLS Freshwater Working Group presented a symposium on the lessons learned from Tropical Storm Irene. The following is an edited version of the transcript from the fifth panel of the symposium.

BOB IRVIN, PRESIDENT OF AMERICAN RIVERS[1]

Well, thank you very much. It is always a pleasure to come to Vermont Law School. It never takes much persuasion to get me to come here; but I have to say I cannot wait to tell my daughter who is about to start law school in the fall that I was the lead-off speaker of the sexy panel. I can see her rolling her eyes now.

I am the president of American Rivers. Since 1973 American Rivers has been working to protect and restore rivers. We have worked on flood management issues, dam removal, clean water, and a wide variety of issues. I have to put in a shameless plug: learn more about us by going to Americanrivers.org and if you want to become a member you get extra points for that. Thank you.

At American Rivers our slogan is "Rivers Connect Us." And just the fact that all of you are here on the beautiful Vermont spring day spending time here, pining away thinking, "When will this guy finish so that we can get to the cocktails?" is a testament about your interest and connection to rivers.

My personal favorite river is—at American Rivers everyone has to have a favorite river—when I started as President at American Rivers they asked me what mine was, I told them the White River in Vermont. If you get the American Rivers calendar, the month of May has a photo of the White River in it, pre-Irene. The reason it is my favorite river is because I spent so many summers up here teaching at the school, watching my kids grow up here every summer. They learned to fish in the White; they got to swim in the White River; they got to tube in the White River. So, it is a very special place to me, and I know that it and the other rivers in Vermont are special to you as well.

I want to take a quick moment to introduce two American Rivers staff who are with us today: Brian Graber and Amy Singler. They work out of the Northampton, Massachusetts office. Brian manages our river restoration work in the New England and New York region, and Amy manages our stream-crossing and river restoration work in the Connecticut River drainage. They both have big jobs and do a wonderful job, and have taught me a lot just in the short time we have had to spend together over the last couple of days.

Well, as you've heard today, if you have no other take-home message, it is that rivers cannot be controlled. We've tried to do it across the country

1. Bob Irvin has been President and CEO of American Rivers since July 2011. As President, Bob leads American Rivers in its mission to protect and restore our nation's rivers.

in so many ways, whether it is the Sacramento Bay Delta in California, the Mississippi River, or here in Vermont. Our attempts to control them through dams, levees, and other encroachments are failing and are giving us a false sense of protection, and Irene brought that home to far too many people.

And, as we have heard from several speakers today, the problem is exasperated by climate change. Professor Parenteau gave a terrific talk on the threat of climate change. I believe it was the first time I've ever seen a PowerPoint slide where the shifting melted.

That's the other take-home message of today. Over the last 50 years, Americans have seen a rapid increase in the flooding events that we are having, and we're going to see more of them. And then, as Christine Klein talked about a few minutes ago, we have a long history of failed efforts to control our rivers. Actually, I add my endorsement to John Barry's book, Rising Tides. It is a terrific piece if you really want to learn about our missteps in river management and how they came about; it is a great book. Another great book on that subject is by John McPhee, The Control of Nature, in which there is a chapter about our efforts to control the Mississippi and also the Atchafalaya Basin.

And so, we've had this long history where every time we have a flooding event we have great push by downstream communities seeking higher levees, more dams: solutions that simply cause rivers to go higher, flow faster, and to increase the risk of catastrophe. Quite simply put, we are not going to win at this game. So, at American Rivers, we advocate a different approach. First, we recognize that rivers need space and that we have to do what we can to manage them so that we move at-risk communities and structures out of harm's way. And second, we have to actively promote and restore our natural defenses so that we manage our rivers as the natural systems they are—our rivers, our wetlands, our flood plains and also our coastal areas.

I am pleased to say that we have a great partnership in Vermont with the river section of Vermont Department of Environmental Conservation. Mike Kline, who spoke this morning, has actually helped lead a section that we put together to promote flood management at various workshops that we've had both in Florida and in Washington, DC.

And, while Vermont's leadership on reducing flood risks is critical, federal leadership is also essential if we are going to reduce the damages caused by flooding. And so, there are several areas that we are working on to promote federal leadership, which can then translate into better protection at the state level. First, there is something called "principles and guidelines," which govern how federal agencies—principally the Corps of Engineers, the Department of Agriculture's Natural Resource and

Conservation Service, and FEMA—administer the federal water resource projects. The last time the principles and guidelines were updated was in 1983, when I graduated from law school. So, you know that is a long time ago, and they are overdue to be updated. The Obama administration has been working on them, but they are not out yet and we have been pushing very hard to get these principles and guidelines updated. We are hopeful that in a second term that that will actually occur, if not sooner. We are pushing to make sure that these non-structural approaches are considered a first alternative rather than a last alternative, and that there be a mandatory planning principle that requires all possible efforts to avoid and minimize environmental impacts, and that there be investments in restoration of wetlands and floodplains. There needs to be guiding principles for federal and water resource management.

And you've heard a lot about the National Flood Insurance Program, so I'm not going to go into great detail over that, other than to say that there are rules currently in Congress (a House bill and a Senate bill) to reform the National Flood Insurance Program. They are supported by an odd coalition: American Rivers, the National Wildlife Federation, insurance companies, and a group that you may have heard of, the Heartland Institute (that doesn't believe in climate change, but does believe that the Flood Insurance Program is broken and needs to be fixed). And all of these groups are working together to get Congress to reform the National Flood Insurance Program to ensure that flood risk maps are actually accurate. We heard about that a while ago, to phase out grandfathered subsidies to homeowners already in the flood plains. Twenty percent of all flood insurance policyholders pay forty to forty-five percent less than the market rate for their insurance, and to strengthen mitigation programs to decrease flood risks and help flood-prone communities, homes, and businesses principally by moving people and structures out of harm's way.

Now another area that needs to be addressed is the Water Resources Development Act. Every two years, Congress passes this large bill, known as "WRDA," that authorizes the Army Corps of Engineers' projects and policies. The last one passed in 2007 and the new one is overdue. We are urging Congress in the next round of WRDA to establish a flood-risk management program, including a levee safety program, and to modernize flood protection to prioritize nonstructural approaches such as moving levees back, modifying them so that they store water naturally. For example, putting in the gates rather than having to dynamite them so that you actually use the former flood plain. By doing these things we will create, across the nation, systems that will promote natural river management and reduce the risk from these catastrophic flooding events that we know are going to occur.

There are a couple of other things that we have to do also, and I know that I only have a minute left, so I'll be quick. One is, we have to address dams. Most people think that dams are some protection against flooding, but in fact the greatest risk in flooding related to dams is dams' failure. During the storm from Irene, at least eight dams failed or were significantly damaged in Vermont and just over the border in Massachusetts. And most of these dams are failing dams that no longer serve the purpose for which they were originally built, to power a mill or to provide water in times of drought. Most of these dams are safety hazards and are ecological hazards as well, and so we are working throughout New England and throughout the nation to encourage removal of these dams in various ways.

We are also working on improving stream-crossings, culverts, and bridges. You heard throughout the day how communities were isolated during Irene as a result of bridges and culverts being washed out and damaged, and there is a better way. The Forest Service here in Vermont, in the Green Mountain National Forest, has been doing something called "stream simulation culverts," where they create culverts that actually mimic the natural streambed. They are a little wider than the streambed and have a natural bottom, and if you are a fish it is hard to tell the difference. The other part of it is that when we have a big storm event, they actually mimic the natural streambed; they can accommodate that kind of flooding and this is the sort of thing that needs to be going on all across the nation. So, again, Vermont can lead the way here. So, while undoubtedly levees and dams and other structures will continue to play a role in our developed landscape, they should be the last line of defense, not the primary one as they have been.

And, if you will allow me to speak New England for a moment, the flooding challenge is truly a wicked problem. It requires reform at the national, state, and local levels. We have to move away from trying to control rivers and toward living with rivers. We have to move people out of harm's way as much as possible and protect and restore rivers and their floodplains for the long term.

And just one last thought to leave you with on. Today, the 100th anniversary of Fenway Park, and I checked a moment ago, the Yankees are leading at the end of one inning, by one-to-nothing. But on this auspicious day, I think it is important to remember: nature bats last. Thank you.

DEB MARKOWITZ, SECRETARY, VERMONT AGENCY OF NATURAL RESOURCES[2]

I want to just start by thanking Vermont Law School and the folks who organized this conference. When I first heard about it I thought, great, really timely. And I appreciated that it was being held now in the spring because really pretty much before now, David and I were straight out with Irene recovery responses, and you've heard from other folks that we are still in the response mode, the initial recovery period. People are still in crisis around Vermont. Unless you live in one of those communities, it is very, very easy to forget that Irene didn't happen such a long time ago, that it's now past history.

I also want to recognize the members of my great staff that are here. You have heard from a number of them—Mike Kline, Kari Dolan, Robert Evans—and you'll hear from David Mears. This is just a sample of the incredible talent we have in the Agency. And I have got to tell you: In the year and a half I've been here now, I just can't tell you how pleased and proud and impressed I am with the work they do for you every single day to protect the environment.

So, I want to start there. We do have some significant challenges ahead of us, and the way that I look at it is from a couple of perspectives. One is, I think about John Muir, the naturalist who was so instrumental in the forest conservation movement. Here is a quote: "When we try to pick out anything by itself, we find it is hitched to everything else in the universe." It is essentially the ecological model of thinking—and you all know that here at Vermont Law School. But in my world that is really, really true. I think of filing cabinets. And, in the filing cabinet, we've got two main focuses. One is our great new energy plan, implementing that energy plan, and thinking about greenhouse gas emissions as we do that. And the second is climate adaptation and what we talked about today—resiliency and resilience to climate change. I want to give another view to the doom and gloom speech Pat gave us, and I tend to be an optimist. I do think change is coming and I do believe we've got the capacity to do the work together to deal with it here.

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2. Deborah Markowitz is the Secretary of the Vermont Agency of Natural Resources, the state agency with primary responsibility for protecting Vermont's environment, natural resources, and wildlife. The Agency also maintains Vermont's forests and state parks. As Secretary of the Agency of Natural Resources, Deborah has shaped the environmental agenda of the state, focusing on the challenges of climate change, habitat fragmentation, and the need to make Vermont more resilient to flooding.

But as Pat showed us all, when we are talking about problems like Irene and the need for resiliency, it really fits with the larger conversation we are having in Vermont—and really across the country—about how we build resilience to climate change. Speaking as an optimist, one of the things that makes me optimistic about this is the power change that is happening nationwide. I have read the study that he talked about, the Yale study. There is a partisan divide about whether or not climate change is happening, and, at the time the study was done, fifty percent of the public didn't think it is happening. And then, of all the people who think it is happening, a majority believe it isn't human-caused. So, we have some challenges here. That being said, our insurance companies, our major industries, they don't want to hear this conversation; they just want us to do something about it. Because you can't be an insurance company and be reasonable without thinking about the impacts of climate change. You can't be a major corporation, a Microsoft or GM, without thinking about the changes we are seeing due to climate change. So, I'm optimistic there.

The other place I'm coming from is that a major initiative of my administration lies with flood resilience even before Irene. Prior to Irene we had our first major historic flood last year at about this time in Lake Champlain. Lake Champlain hit historic levels and stayed there for months, and months, and months, causing incredible devastation to communities, businesses, animals. Out of that—ironically about a week and a half before Irene hit—the Governor and Commissioner Mears and I stood up and announced a flood resilience initiative that was focused on Lake Champlain. It was going to be multi-jurisdictional. We were bringing in the state of New York and Quebec, and the international commission that helps fund studies on the Lake. So, resiliency was on our radar—and then Irene hit. And Irene really focused it for Vermonters and brought the issue of flood resiliency to a new level.

Going forward, where are we coming from at the Agency? It is back to that John Muir quotation that everything is connected. When I think about flood resiliency, I am also thinking about the major environmental issues of our times because they are all tied together—the health of our water bodies, our lakes, and our streams. This summer in Lake Champlain we had the highest level of phosphorus that we've seen; it spiked off the charts. When we studied that, we learned that, while we focused on agriculture, on urban runoff, suburban runoff, back roads (in our smaller dirt road communities), but really it was the scouring of the streams and the erosion of the river banks during the flood that made a huge difference in water quality. So, the same solutions for the things we need to do for flood resilience are the same things that are going to help protect the quality of our waters.

Now, take a look at Lake Champlain or rivers that did better, that were resilient. It was because they had vegetation right up to the banks; even better, forests up to the banks. And water basins face serious challenges when people make decisions to cut down trees so we lose our blocks of forest land which are so important for flood resiliency, for the health of our economy, and also for wildlife habitat. Wildlife habitat connectivity is a huge focus of my administration. What we do to protect our rivers, what we do to protect our forests creates the kind of habitat that will provide a great place for everybody to live, not just for us humans. And so on, we can see that everything is connected.

So, I take a global look at this issue. There are things that we need to do to move Vermont forward and there are things the agency is already doing. We are taking a look at green infrastructure. The Governor recently signed an executive order directing us to bring together all the state agencies to look at different ways to deal with, for example, storm water. In our communities, if you deal with storm water in a less engineered way, a green way, to try to put in systems that mimic the natural systems to slow down water and let it infiltrate instead of running off into brooks, it makes the community more resilient to flooding and is better for the habitat and it protects the quality of the water. This is one initiative.

We are working with folks in our non-profit community that would purchase conservation easements to try to identify areas that should be conservation priorities. There is not a lot of money in state government; in fact there is not much money in the private sector either, or the non-profit sector, to secure all the land we should preserve, but we need to get started.

We've been partnering with others to repair some of the stretches of stream and rivers that were damaged in the aftermath of Irene. We have a list of high-priority areas, and actually to our surprise, our fish biologists' surprise, it was an awesome opening weekend to fishing season, even in some of the Irene impacted waters. People were fishing in different places because the storm rearranged the habitat. So, that for me, speaking as the optimist, was incredibly hopeful as well.

I want to leave you with this thought that David and I, and the leadership team of ANR, make one of our mantras. We have some very significant challenges here in Vermont and in the rest of the country. We can be a real model; we want to be a model; and we have a secret weapon because one of the things that we know is that government, as public servants and as agencies can't do it alone. If we are going to deal with, for example, greenhouse gas emissions, climate change, there's not much government can do alone; we need everybody to help. So, we are not going to be able to successfully meet the challenges facing this State if we just stay in our little ivory towers and try to do it ourselves. We need to engage

Vermonters at all levels. Our secret weapon is that Vermonters are engaged and ready to be part of the solution, ready to act. We have some tough choices ahead of us. We are working closely with the regional planning commissions, with municipalities, businesses, communities—and I really have hope for the future—using that incredible brain power of our scientists at ANR and our sister agencies.

One of the remarkable things is that we are working with the Agency of Transportation in ways that we haven't before. They have this strategic plan, and in it they assert that they are an environmental organization. One of their strategic goals is to reduce environmental emissions; so we are working in partnership. Chuck Ross is not able to be here today, but he is part of that same partnership for solution.

We've got a lot to bring to the table and hopefully with your help we'll move ahead and make Vermont more resilient because there will be more floods; we know that, and we're going to be ready.

JOE SEGALE, POLICY AND PLANNING MANAGER, POLICY PLANNING AND INTERMODAL DEVELOPMENT, VERMONT AGENCY OF TRANSPORTATION[3]

Hello everyone. My name is Joe Segale, from the Vermont Agency of Transportation, and I'm the manager of policy and planning, and I'm relatively new at the agency. I've only been here since November. I thought that's just the way state government works, that everyone works together. So, it is a pleasant surprise to me.

So, I'm going to talk about building a resilient transportation system, and I want to start first by defining what I mean by what is a resilient transportation system. And the working definition that we have is that when a storm or an event comes, the transportation system will continue to function. People will be able to get in to work, goods will continue to move, and it is either get it back really quick or is it going to stand up to what that trauma is. So, that is one element of it and then the other element of it is that the transportation system itself—the roads, the bridges, the culverts—won't actually exacerbate the event itself. So, it is kind of a two phased approach.

So, as a planner and engineer, I have a five step process on how we're going to get to a resilient transportation system. It starts really first with planning, and I like the comment that I heard about adapting consciously, avoiding the unmanageable, and managing the unavoidable. And, to me,

3. Joe Segale is the Policy and Planning Manager at the Vermont Agency of Transportation. A chartered transportation engineer, he is the former Director of Transportation Planning at Resource Systems Group (RSG), a transportation consultancy.

that is really what planning is all about, that forward looking assessment of what's going on and how we prepare for it. So, we are kicking this off with integrating this process with the ANR and also with ACCD because the solution to building a resilient transportation system is really a multi-disciplinary solution. It is both land use and the environment and its infrastructure. So, that is the basic overall concept that we are going to take. In a sense, to first identify where the vulnerable facilities are, and that is where we overlay river corridor management with transportation planning, and we've seen a lot of maps today where we've seen the erosion hazard zones and so on, and that's a relatively easy step. So, we are moving forward with that, and ANR will continue these river corridor plans.

I'm going to skip the second step because that is about risk. I want to talk about that a little bit more later, but the key step here is identifying strategies. I talked about land use and how land uses are really an important part. Part of the solution might be smart growth, and I will argue that smart growth development patterns act as resilient transportation patterns. A smart growth pattern has a network of streets. The network is more resilient. Smart growth allows for shorter trips. It allows for multi-modal access. So, it is all these options that really are what resiliency is all about. So, building in a smarter way is also building a resilient transportation system. It is about river management as a way to address transportation infrastructure. Mike Kline gave a great example down in Bennington, the way the river has been sort of re-engineered in an environmental way so that it has a flood plain that meets the flow and so on, and it is protecting the bridge downstream. What would be interesting is to think about that as a transportation project, not just a river management project, and pay for that with transportation fund. So, you know full integration of all that.

And so, the other part of the planning process is going to be thinking about risk. So, as you know, there is a map that shows all the flooding that has happened in Vermont in the last ten years or so, and it is everywhere, right? And if you overlay fluvial hazard zones with the roads and bridges, you'll see they overlap everywhere in the state.

So, how do we really prioritize and identify where those high risk locations are? The answer right now is, I don't know. That's why we are going to be hiring some help to help us figure that out, but some of the factors that go into that are: is there a hospital nearby, is it a high level roadway facility, and so on. I think it is beyond that. I think, thinking about risk also thinking about climate change and how rainfall is going to change and somehow factoring that into the decision.

So, risk leads me really into the next step, which is prioritization. So, we have a lot of other needs in the transportation sector which we have to deal with. One quick example is: we've had twice as many fatalities this

year so far as we did last year at this same time. So, that is critically important. People are dying, and we have to think about addressing that, but on the other side, we also want to think about how we are planning for the transportation system in the future. We want to get rail to Montreal, right? So, we don't want to let all those things go and bring resiliency to the top. So, prioritization is really about balancing and integrating resiliency with the funding decisions and the programming that we have to do.

And that brings me naturally to funding. So, funding is a huge issue. And something else I learned about in state government is that when VTrans comes into a room with other state agencies, they kind of look to us for money. We do have a large budget—a half billion dollars. But to put that in context, we've also done an evaluation of what we need, and the shortfall every year is about $200 million. So, that is huge relative to our base budget. So, we don't have as much money as everyone thinks. And so, how are we going to pay for resiliency in that context?

The other challenge that we have, is that, while it easy to just think about the state system, eighty percent of the roadways in Vermont are owned and maintained by municipalities, 14,000 miles of roads. Eighty percent of those are paid for by municipalities. So, just the risk and vulnerability for any given event, eighty percent of the damages are going to happen on the local system. And what's even harder is that a significant portion of the cost of maintaining road systems is actually supported by the property tax. Yes, we give state money to municipalities, but most of the local road system is really supported by property taxes. So, we talk about upgrading roadway codes and standards and putting more pressure on the locals; we can't do that either without putting pressure on local property taxes or providing some sort of funding relief.

So, the big picture with funding is that I don't have an answer. We just need more. We have structural problems with funding sources. I won't go into that. That is first, but after that, somehow we need people to understand that somehow it is cheaper to fix it now than it is to fix after a disaster. Maybe that is the message that we keep needing to be getting across.

The fourth is design and operation of the system. We talked about standards and making sure those are up to speed and so on, and training and building green; that was a point that was made earlier: building a green and a more resilient transportation system. So, I think those are all opportunities as we move forward.

And, in the last step, I think I may even be ahead of my allotted speaking time, is implementation and how we are actually going to build this. If you think about it, we are actually going to completely rebuild our

transportation system in the next eighty years, because we do that every eighty years. It is a constant renewable cycle. I'm optimistic because I know that as we rebuild our system, we will rebuild it in a more resilient way, and we are doing it already. There is anecdotal evidence that, after Irene, structures that were built in the last five or ten years actually did pretty well. So, we know we are heading in the right direction, and we've learned a lot.

We've learned a lot about how to incorporate aquatic organism passage and wildlife passage management and how to size culverts in ways so that they accommodate flow and sedimentation. So, that's all right up there with what we are thinking about. And Mike Kline was saying that in the past, VTrans and ANR had technical conflicts about what the right way to do things and now we are on the same page. So, we are well positioned to build a resilient transportation system. I think whenever we think about resiliency; I think it fits really well with what our vision is: to build a safe and efficient multi-mode transportation system that improves the quality of Vermonters' lives.

BRIAN SHUPE, EXECUTIVE DIRECTOR, VERMONT NATURAL RESOURCES COUNCIL[4]

Just a quick introduction, Vermont Natural Resources Council will be celebrating its 50th anniversary this year, my first shameless plug, November 22, Shelburne Farms. We were founded 50 years ago by farmers and foresters, folks in the tourism industry, outdoor recreation, anglers, hunters, folks who were worried about the land base and protecting their livelihoods and their outdoor pursuits and their recreational pursuits in the face of great change in the landscape in Vermont. That continues to be a lot of our focus.

I come today with the question of resiliency. I was looking at the four program areas that we have in the VNRC, so I am going to address how we are looking at resiliency in different ways. I didn't have the benefit of being here all day, and I didn't hear Pat Parenteau this morning. But, I have heard him before, and one of the lessons I want to bring to our talk about resiliency or adaptation or preparation for climate change is that we need to do that, we need to do it urgently.

Earlier, Secretary Markowitz talked about the other flood of last year. Actually, in my community in the Mad River Valley, we had flooding in

4. Brian Shupe most recently served as Sustainable Communities Director and Deputy Director at VNRC. Brian has over twenty years of professional planning experience.

May that did more damage to the town infrastructure than Irene did. We also had the snowiest February on record, and this winter was very weird. So, the global changes in our climate are obvious, and we do have to deal with it, but we still need to deal with prevention because if we don't reduce greenhouse gases, if we don't continue to try to stop climate change, it's going to be worse than we ever imagined. So, I didn't hear the doom and gloom speech by Pat Parenteau, but I have heard it before, and I happen to agree with him. So, prevention has to be part of resilience.

ANRC has four program areas. We have an energy and climate program which deals very much with straight energy conservation and energy efficiency in developing renewable energy. We've made great strides in Vermont to that end, especially with starting to develop more renewable electricity; we are doing energy efficiency for electricity. There is a lot more we can do for energy efficiency. We haven't even begun to address our thermal efficiency, and, as Joe Segale says, our transportation efficiency is a very difficult task. A lot of that has to do with our settlement patterns and how we develop our communities.

Our second program area is sustainable communities. We deal a lot with trying to promote smart growth development, looking at efficient land use patterns that promote efficient transportation infrastructure. Our Sustainable Communities Program also looks at other issues that relate to resilience such as local food production, preserving our agricultural land and keeping it in production, and investing in the enterprises that promote the ongoing viability of the working landscape. The legislation passed this year is probably the only new program created this year—the only program with new money—is the working lands program and it is going to begin to promote and invest in working land enterprises. It is a bit of a small program, but very promising, and we hope to build on it in the future. We also, I appreciate Secretary Markowitz talking about the goals of the ANR because it very much mirrors the goals of VNRC; she mentioned that habitat connectivity and forest adaption.

Our third program area is forest and wildlife, where we are very concerned about deforestation and conversion of it for development. Several years ago the commission on climate change issued a report that had several strategies for combating climate change. The most significant one with regards to curbing greenhouse gas emissions was to slow the conversion of forest land to non-forest uses. We really haven't been able to tackle that. The ANC is working at the community level across the state on forestation and habitat connectivity as a resilient strategy.

And then, finally, we have another program which is probably most directly related to the topics we talked about today. The second plug: On May 16, the VNRC will be co-sponsoring a river management conference

that will be held in Montpelier. Many of the people at this table and many of the folks in this room are partners in that effort, and the program was based on the immediate aftermath of Irene. A lot of folks are coming to us and are very concerned about the river management practices that were happening as flood recovery and flood prevention that seem to be running counter to what we have learned over the years through the rivers management program here in Vermont. We want to make sure that river science—that is really as much about protecting the ecological values of our rivers as it is to protecting property from future flood events—make that science known, and make it available to local decision makers and state decision makers. So, we are working very closely not just with VTrans, but with ANR watershed organizations and other groups to have that conference. I'm glad to say it is filling up quickly. I'm not the guy to talk about river science in the room with Mike Kline and Kari Dolan, but they will all be part of the agenda, and we are really looking forward to that program.

So, those are the four program areas the VNRC has and some of the issues we deal with. I was asked as part of the panel to talk about some of the policy solutions that we might have to create greater resilience. I can come up with some to the solutions we might have to create greater resiliency, but I really struggled with some of the challenges that we have, and I am hearing the other comments and thinking about how we are making decisions in Vermont in regard to land use, in regard to river management, and in regard to transportation.

I kind of came up with three issues we need to address. One is the relationship between local decision makers and state decision makers. We rely very, very heavily on our municipalities to make decisions that affect the state as a whole—land use decisions and transportation decisions. There is strength in that. The real lesson to me from Irene is the strength of our communities. I know in my community how quickly people filled the village; the volunteers went into strangers homes, shoveled out mud, and, in many senses, it brought the community together. But we are expecting our communities to regulate land development to avoid encroachment in the flood plain, to protect our roads and hazard areas. They need our support, they need our help, and they need a policy framework in the state. I believe they need a lot more direction from the State. In Vermont, the population is smaller than, I think, something like eighty-five municipal jurisdictions around the country. We do need to have, I think, a stronger role in state government and local decision making. I'm an outlier in that impossible thing to do; but when it comes to holding our communities accountable for good decisions, we need to think about that.

That brings up the second area. We have some pretty good laws on the books in Vermont to deal with land use, development, and land conservation, but, in many respects, they are very dated. Act 250 is forty years old. Those criteria came about when climate change was really an obscure concept. Act 200 was created over 20 years ago; it has pretty good land use development and planning goals with that, but communities have not been held accountable for them. They weren't developed in the era of climate change and adaptation and the need for resilience. So, looking ahead at our growth center law, our downtown law, our many different regulations, holistically, in how they relate together and how they relate to the challenges we are facing in the future, would be a really good thing. We spend a lot of time in the state house arguing over little procedural things, and we never talk about the real depth of all our various programs and whether they are achieving goals.

And the final thing I will say is: our big opportunity and challenge is this administration has tremendous capacity for leadership. I am really, really excited about people who are in ANR, VTrans, Commerce and Community Affair, Agency of Agriculture, and we are going to need to make sure our governor is as good as his staff, and I think that is one thing we at the ANRC can use its role to make sure the leadership happens. We have the people in place to make good decisions and bring the state forward, and whether we have the political will to do it or not, I think we are going to see in the months and years ahead.

DAVID K. MEARS, COMMISSIONER, VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION[5]

Alright, so getting close to being the last thing between you and a beer, let me ask this question: how many of you are law students left in this audience? Awesome! And how many Masters of Environmental Law and Policy students? A handful of those. And of those, how many undergraduates? I see at least one. How many of you have ever been a student? (Laughter)

I was a guest lecturer a couple of years ago here at Vermont Law School; I was in my early twenties, and I made the mistake of letting the students ask me questions and had the arrogance to think that I had all the answers for them. One student, at the very end, the very last question was: "What have law students ever told you or taught you that was helpful or

5. David K. Mears is the Commissioner of Vermont's Department of Environmental Conservation. He is a former Associate Professor at Vermont Law School, and the former Director of the Environmental & Natural Resources Law Clinic.

useful?" There was such a long list of things running through my head that I was paralyzed for a moment, but, on reflection, what occurred to me is that the most powerful thing that I got during my time teaching law students was the sense of shock and surprise when they came across injustice. The sense of amazement when they found out that the government didn't work the way they thought it should. I would love to recover that. So, I appeal to all of you who were ever students to try to remember that time when you were so curious and try to figure out how to solve these problems. This problem of climate change breaks my brain. This issue of resilience actually starts to feel though like something I feel I can get my arms around.

And, with all respect to my former colleague and mentor Professor Parenteau, I like talking about flood resiliency because it does give me something that I feel like I can do something about. There will never be an opportunity, at least in my professional life—I've certainly not seen one in the years since I started working in the environmental policy arena—where there will be such a confluence of attitudes and appreciation for the relationship that we have as human beings to the natural environment as we do right now in this time and in this place. What Irene taught all of us is that we are connected to this landscape. Everybody gets that right now. Now, there may be a few people on one end of the spectrum who don't care, and they don't want to be part of the solution, and they are just out for themselves. But, I think that is a small minority here in the state of Vermont.

I think the majority of Vermonters feel very connected with their government. They get it; they get it that in a state like this, you can't point your finger and say "those people in Montpelier" or "the federal government" just doesn't get it. They understand, we understand, that here in Vermont, that in a democracy, government is us.

I can't really even begin to recap all of the conversations that happened here today. I think that within this room, there is the capacity, knowledge, and understanding to solve a large number of the problems associated with protecting this State against future flood damage, and I think part of the challenge for us is to develop a culture of competency. That is, the competency to reach across the table to people that otherwise we might not spend time talking with, find the right language, the right words, the right connection to be able to talk about this in the context of public safety, of negating public damage, about efficiency of government, as well as protecting water quality, as well as regaining future damage to the flood plain, about protecting wetlands and fish habitat. These things overlap when you start to talk about flood resiliency, and for this moment in time

here in Vermont people understand that those things are connected. You just have to use the right words.

I want to talk for a moment about farms because our friend Secretary Ross has not been able to join us, and I feel like I can do a mind connection with him because I spent so much time with him in the past fourteen months or so. Starting when I was still in China, Chuck Ross contacted me to say: "Mears, we've got to get together on this whole agriculture and water pollution issue because it is a big issue and we've got to talk." So, we've been spending a lot of time together. We have also talked about flood issues and about the role of agriculture in dealing with flooding. There is no question that our farms, the iconic landscape of the working landscape of forests and farms, are a critical part of flood resilience. We need to make sure that we are thinking about how agriculture connects to the way that our landscape functions. A well-operated farm with good soil management, with good crop management, is a fantastic way to maintain the natural hydrology of the landscape. A poorly managed farm that has compacted soils that is tiled, and drained, and ditched has the potential to add to the problem. It is not as simple as just walking out the door and walking up to the Montpelier Statehouse and saying here is an across-the-board solution.

It is more complex because every farm has its own unique landscape. We have to be able to have a conversation with folks like South Royalton's Geo Honigford. We have to be able to have a conversation and ask him: what are the ways we can work with you to make sure we protect the economic model, in his case of, your small organic farm, and how do we take advantage of the fact that your farm land, which is in the flood plain, is actually a critical part of flood resilience. I don't know what the answers to those questions are, but there is a connection and a conversation that needs to happen. Okay, so that's my bit on farms.

Another thing that, as we think of it, is this thing about democracy and government and the role that we all have as members and participants in this system, is to think and understand and appreciate the fact that it is multi-layered. You know, I took some shots earlier at FEMA in terms of the efficiency here in Vermont, but I am deeply appreciative that we have a federal program, a federal disaster response relief program. I am deeply appreciative of the individual people that came down who have integrity and commitment to try and solve problems with us. I appreciate the fact that the EPA and the U.S. Fish and Wildlife Service, and the U.S. Department of Agriculture Natural Resources Conservation Service and the U.S. Army Corps of Engineers, that all of those federal agencies played a critical role in helping us respond to this flood and that they also understand that they played a critical role in helping us mitigate against

future floods. Now, they have their own constraints and issues, but none of them are monolithic and none of them are permanent in the sense that we can't change them, that we can't fix the problems that we run across. And maintaining a good relationship with them at the state and local level is a critical part of building flood resilience.

Similarly, there is no question that the relationship between the state government and local government has been a fundamental one that we need to build on and grow. If we have learned anything about responding to Irene, it is that many communities across the state lacked the capacity to deal with a flood of this magnitude and that they frankly lacked the capacity to plan for and mitigate and deal with the complex issues that face all communities across the state with the mix of infrastructure demands—whether it is road construction, sewer, water, stormwater, development patterns, and the like. And I know as an aside, because I know there are some folks here from regional planning commissions, that one observation I have, is that in Vermont the regional planning commissions, in many cases, played a critical role in helping to bridge and connect those three levels of government. So, that's an area also, as I look forward to state wide policy, that I think we need to invest more in, that is making the RPCs, the regional planning commissions, a critical part of how we respond and mitigate against future flood damage.

And, the last thing I will say to those of you who are going to graduate in the next few years or those of you who graduated long ago, is that: in order for a democracy to work, you have to be engaged. What I took from the message and conversation about climate is that we have to do something now. And the "something" is hard to define, but I know that one key element of what we do is engagement. At the local level, that is recruit and support local leaders. I don't know if Geo Honigford is on the local Selectboard here in Royalton, but if he is not then I—who is here from South Royalton? Your job is to take a six pack of beer down to his farm and persuade him to run for Selectboard because the man is obviously a brilliant leader and a person who could inspire and deal with important local problems. There are people like that in every community in the state and we need to find them and support them and get them elected—same thing for the state representatives and statewide policy positions and at the national level. We have to be engaged in getting those people elected.

And, the last thing, and this is selfish in the extreme, we need resources in the State of Vermont. We need resources at the local government, and the federal government needs resources too. These are tough questions and we are confident that those of you who are recent graduates are coming at this after decades of cynicism, deep cynicism, about the role of the government and the unwillingness of the broad public to invest in

something that they see is broken. But, the fundamental flaw is that there's been the sense that we've been disconnected from our government and that the government is the problem. We need to invest in our government to make it successful. It doesn't mean that you let us off the hook or you don't hold us accountable for spending your money wisely, but that has to be part of the solution. I can tell you from where I stand now, I can't possibly do all the things that this wise panel of folks and all the ones previously have laid out for us as tasks without some more resources. Thank you.