



# NORTHWEST POWER AND CONSERVATION COUNCIL April 14-15, 2009

The Council focused on the Sixth Power Plan at Skamania Lodge this month, with staff updates on how resources are stacking up, the utility take on vision-versus-reality in resource planning, a Northwest Energy Coalition presentation on its *Bright Future* analysis, and BPA’s view of its resource acquisition needs. The Council cast votes on projects associated with the Columbia Basin Fish Accords, unanimously recommending that four move forward for funding. Next meeting: May 12-14 in Walla Walla, WA.

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## THE AGENDA

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### NWEC’s *Bright Future* Long on Vision

Opening a work session on the Sixth Power Plan, Power Committee chair Melinda Eden said she had intended to introduce speakers from the Northwest Energy Coalition (NWEC) and PNUCC as “bookends” on the spectrum of a vision for the Northwest’s energy future. But the speakers didn’t want

this to be framed as a dichotomy between one set of interests and another, she stated. After the presentations, I expect the Council will have “a vigorous discussion” about our vision for the power plan, Eden said.

NWEC’s *Bright Future* is the second report in a “Light in the River” series, according to Sara Patton of NWEC. The report’s subtitle refers to the interconnected goals of keeping the lights on, growing jobs, moving goods, and swimming salmon, she said. The report is NWEC’s effort to take on the issues where

clean energy, climate change, and preserving wild places intersect, Patton explained. She laid out the challenge of reducing carbon emissions while serving growing electricity loads. For its analysis of how to meet the future, NWEA chose the goal set by the International Panel on Climate Change (IPCC), which aims for a 15 percent reduction from 1990 carbon levels by 2020 and an 80 percent or larger reduction by 2050, Patton said. Coal fuels less than one-quarter of the electricity in the Northwest, but produces 87 percent of the greenhouse gases, she said. And the hydro system “will have to give back megawatts to the salmon,” Patton stated, adding that *Bright Future* looked to a 1,000 megawatt (MW) reduction in hydro generation from removing the Snake River dams.

According to *Bright Future*, the region would need another 6,500 average megawatts (MWA) of power by 2020: 4,000 to meet new demand; 1,000 to replace generation from the Snake River dams; 1,000 to replace coal-fired generation; and 500 to fuel electric vehicles. By 2050, the region would need another 19,100 MWA: 12,000 to meet growth; 1,500 for electric vehicles; and 5,600 to replace coal-fired generation, Patton said.

*Bright Future* sees energy efficiency as “the powerhouse” that can provide an additional 340-MWA resource annually, she said. Combined heat and power (CHP) technology is another piece of the solution, Patton added, as are new renewables, including wind, solar, and geothermal. The Council’s estimates of conservation potential are even better than 340 MWA in the out-years, she pointed out.

The renewable resource potential in the Northwest “is more than enough” to meet future power needs, according to Patton. In outlining the potential by state, she pointed

out that the analysis includes only 20 percent of the wind potential in Montana because there would have to be new transmission built to make use of it. Patton said that beyond using hydro and natural gas to integrate wind, Smart Grid technology has the potential to be valuable for that purpose.

The region has more than three times the energy efficiency, CHP, and new renewables to meet demand between now and 2050 at 10 cents per kilowatt-hour (kWh), she continued. And there are many local jobs associated with clean energy, more than with conventional resources, Patton said.

In comparing two cases – one called “business as usual” and one called “bright future” – she explained that the two have about the same amount of energy efficiency at 3 cents per kWh, but the latter includes far more renewable resources, as well as energy efficiency at 6 cents per kWh. The bright future study assumes coal plants will be retired at the end of their economic life, Patton stated.

When the cases were analyzed for cost, NWEA found the impact of the bright future case on the average electricity bill would be 0.67 cents per kWh higher for 2020 and 0.68 cents per kWh for 2050, she said. And that doesn’t count the benefits of a cleaner planet, robust economy, abundant salmon, and energy security, Patton stated. “We think it’s a bargain and the way to go,” she said.

Moving to recommendations, Patton said the Obama Administration and Congress should act quickly to set carbon emission limits and establish a mechanism to meet them. But the Northwest can’t wait, she stated, adding that NWEA is working with the legislatures in Oregon and Washington and with the Western Climate Initiative to get out ahead of

national action. NWECC is also encouraging regional leadership from BPA on energy efficiency and renewables, Patton said. BPA is doing “an amazing job” with energy efficiency and integrating renewables, she added. Its leadership needs to be redoubled and encouraged by the federal government, Patton said.

The *Bright Future* report also recommends a strong regional power plan, she stated. The Council should take the initiative to meet the IPCC goal, Patton said. We also need to work to extend state renewable portfolio standards (RPS) and prohibit both new coal plant construction and extending the lives of existing coal plants, she wrapped up.

#### Nukes, Costs, and Balance

Council chair Bill Booth asked whether NWECC outsourced the economic research in *Bright Future*. NWECC analyst Steve Weiss is the lead author of the report, and he did the research, Patton responded.

Booth asked whether Weiss considered nuclear plants as a future source of energy. Weiss said he had not. “Nuclear power is controversial in this region,” and questions of cost are still up in the air, he said. Patton added that NWECC got its start in the region because energy efficiency was being ignored in favor of resources like nuclear plants. “We would always look for energy efficiency first,” she stated.

Tom Karier asked Weiss about the issues of capacity and the flexibility to integrate wind. We are not proposing to shut down natural gas generation, Weiss replied. But the Smart Grid is where we need to go for backup, he said, adding that technology is on the way that would allow for remotely altering the charging rate for hybrid vehicles and

adjusting the temperature in water heaters and refrigerators. We expect the Smart Grid to be the solution, Weiss stated.

We need a vision in the Sixth Power Plan, and you have given us yours, Dick Wallace commented. My question is with the underlying assumptions in your report, he said. You have renewables meeting future load at 10 cents per kWh, but my sense is that the next increments will be more expensive than that, Wallace stated. What underlies your assumption that renewables will continue to cost about what they cost today? he asked.

The cost of all technologies is going down, Weiss replied. The price of wind generation has come down, and we are confident that the price of these technologies will decrease based on their past track record, he said. We think the costs of integration will come down, too, Weiss stated. These are assumptions, but “we don’t think they are unrealistic” – you could have nine-cent power with a one-cent integration cost, he said.

One tool in the toolbox is diversity of location for renewables, Eden said. This has been “an unhappy week” in terms of the potential to get resources to load centers, given Oregon’s legislative action on transmission lines, she indicated. How do we get the resources to where they need to be? Eden asked.

We need balance and tradeoff, and I think there will be, Patton responded. She pointed to efforts that would allow the federal government to pre-empt siting decisions for transmission. It is a difficult problem, Weiss said, adding that the consideration of local interests is up against state, national, and global interests. Nothing will be easy, he added.

## Utilities Plan Clean Realistic Future



John Prescott of PNGC Power, citing his extensive background in utility operations and planning, told the Council he would share some practical thoughts for the Sixth Power Plan on behalf of PNUCC members. We want to ensure the region's utilities and the Council have a common view on the basics of the current power system and future challenges, he said. We also want the power plan to clearly communicate the complexities of the system and the challenges of ensuring an adequate and reliable power supply, Prescott stated.

We share a vision of a cleaner and reliable energy future that is affordable and supports a vibrant economy, he said. PNUCC members are developing a common vision they will return to discuss with the Council in the near future, Prescott added.

As the previous speakers demonstrate, a lot of people today are thinking and talking about energy, he continued. Utilities and trade groups around the Northwest have asked customers their opinions on energy, Prescott said. We found customers are proud that we have the smallest carbon footprint in the country, and they value clean renewable hydro, he said. Customers want us to add resources that are environmentally and climate friendly, but they also want us to be mindful of costs, Prescott stated.

Utilities are headed toward an energy future that embraces conservation, efficiency, and renewables, he said. Our integrated resource

plans call for those resources, and we will continue to be at the forefront with them, Prescott stated. According to PNUCC's Northwest Regional Forecast, utilities plan to acquire the equivalent of 1,700 MW of energy efficiency in the next 10 years, along with renewable resources, he reported.

While we support clean energy goals, "we are obliged to be realistic and consider real-world consequences," Prescott said. The recommendations you make for energy supply and climate change in the Sixth Power Plan must be achievable and realistic in terms of cost, he indicated. The majority of new generating resources over the next 10 years will be powered by natural gas, with 1,400 MW planned in the next decade, Prescott said. "That may not be what any of us prefer, but that is what is practical," he stated.

To understand the complexities of the power system, I'll offer a quick "power system 101," Prescott went on. "On-line electricity generation must *exactly* match the instantaneous demand for electricity," he stated. Load is volatile and if you add variable generation, you've introduced a great deal more volatility to the system, Prescott explained. We know what it takes to maintain reliability and affordability, and the cost and complexity of integrating wind resources into the system without jeopardizing reliability is a case in point, he said.

We oppose removing carbon-free, renewable resources like the Snake River dams, Prescott stated. It does not make sense from a cost or climate standpoint, he said. With proper mitigation, the fish don't require dam removal, and the majority of voters oppose it, Prescott added. Utilities have an obligation to raise concerns when they see proposals

like the one in *Bright Future* to remove the Snake River dams, he stated.

Prescott urged the Council to be vigilant and ensure the Sixth Power Plan is both visionary and realistic. The Council's plan "cannot be a wish list that gets out ahead of what is technologically feasible" and must provide a voice of reason and independent analysis, he said. Prescott went on to urge the Council to package the plan so consumers understand power system costs, down to the level of retail rates. There is an opportunity with the plan to educate customers, he said.

The "struggling economy" is yet another consideration, Prescott continued. Clean, affordable, and reliable electricity is a must to compete nationally and globally, he said. As utilities, we have the obligation to balance the need for new resources with environmental stewardship, reliability, and costs in the form of the monthly electricity bills customers pay, Prescott said, adding that difficult economic times make that obligation more important than ever.

Wallace asked about his view of the Smart Grid. We hope it is part of the future, Prescott responded. But the term Smart Grid implies the grid we have today "is dumb," and it is actually very sophisticated, he added. We are teaming with BPA to explore the potential, Prescott said.

How much focus are the utilities putting on conservation? Jim Yost asked. In post-2011 contracts with BPA, utilities face purchasing power at Tier 2 rates and that increases the value conservation offers, Prescott replied. We have an economic reason to do more conservation in the future, he said. Some of what BPA is offering in its conservation program does not work for rural utilities, so we want autonomy to have our own offerings, Prescott added.

Are we underestimating the demand for electric vehicles? Booth asked. We wanted to get that on the radar screen for the plan, Prescott responded. Tax credits will be key, and Congress is using them to stimulate demand, he indicated. Electric vehicles are coming, and they will impact the system, Prescott concluded.



### **BPA Cogitates on Resources**

Paul Norman of BPA pointed out that BPA foresees the need to acquire resources in coming years and must be consistent with the Council's plan in doing so. BPA could potentially need to augment its resources to serve Tier 1 load, he said. Customers will buy as much as they are entitled to from Tier 1, and we could need to purchase seasonal energy and capacity to meet that load, Norman said.

BPA will also acquire resources to serve Tier 2 load, he continued, noting that customers have a choice about whether to purchase from BPA to meet load beyond Tier 1. In addition, BPA will have a need to acquire resource support services (RSS), Norman said. We have told our customers we will firm up wind resources, including capacity, but we don't know how much RSS we will need, he said. We will also need ancillary services for wind integration, and that could be significant, Norman stated. We have not reached any conclusion about the amount of resources we will need, he acknowledged.

With regard to capacity and flexibility, "I'm glad you are talking about it," Norman stated. Our assessment points to the need to buy capacity in winter heavy-load hours, he

reported. We are hitting our capacity limit on wind integration, which points to a need to acquire, and we would not want to see a Sixth Power Plan that does not address these issues, Norman added.

We expect to see an increase in the conservation targets, he continued. We've done well with exceeding the targets so far, but a lot was due to introducing compact fluorescent light bulbs, Norman said. Utilities are stepping up with their own conservation programs, and it may be appropriate to break down your lump-sum conservation target in terms of categories and where savings are to be achieved, he suggested.

Some flexibility and capacity needs can be met with demand response, Norman said. We should "push the envelope" there, but we don't have estimates of what we can achieve, so we can't be reasonably sure what's achievable yet, he noted.

Norman said the Council can provide scenario analyses that point out the implications of big policy choices, like carbon costs and impacts. We need that, he added.

Addressing the *Bright Future* report, Norman said a future with all conservation, renewables, and Smart Grid is attractive – that vision is good and inspirational. But the report is being used as support for things like removing dams and other resources, he pointed out. The report does not have the quality of analysis that would be needed to approach something like dam removal, Norman stated. "It is not up to snuff," he said, adding that the Council needs to put forward a reliable future "we can count on." Karier said the Council and BPA need to collaborate on the issue of providing system

flexibility. He asked if BPA's request for information (RFI) had produced insights. Norman said BPA would be looking to acquire from the RFI offers received, but the technology must be in place to accommodate automatic transactions for third-party services. There are also other decisions to be made about when one would call on those supplies, he said, adding that pilot projects would help to work out those issues. Norman said BPA would share its work in that area with the Council.

### Turning to the Vision Thing



The Council's power plan has to consider the resources that are available, according to staffer Terry Morlan. But technology has changed over time, and in shaping a vision, we should think about what the future looks like 20 years from now, he said. Is the future large central-station generation or is it more akin to Smart Grid? Morlan queried. And how committed is the Council to meeting climate change goals? he asked. We could have a discussion about all of these things as we consider the vision, Morlan stated.

Yost pointed out that Idaho does not have an RPS, yet utilities are engaged in conservation because it is cost-effective. He said he would like to see an analysis of what would happen with resource choices absent an RPS mandate. What would the model show us is the most cost effective? Yost asked. The RPS may force things that are not cost-effective, and I'd like to know what happens without that mandate, he stated. Yost also raised several questions about how the cost of conservation is reflected in the portfolio modeling and ultimately the plan.

Karier said staff has done impressive work identifying the available conservation. We can show the public how much conservation potential is out there – no one does a better job of this, he stated. If conservation and renewables will cover load growth, the next question is removing generation resources from the power system, Karier said. We need to know more about adding wind and the potential for integration, including what it costs and what it does to reliability, he stated. That is key to talking about reducing carbon, and when we have that information, we can look at ways to get there, Karier added.

In terms of a vision, we need to look at the interaction between fish and wildlife (F&W) and power, Wallace stated. They aren't in opposition to one another, he said. Climate change has implications for both, and a vision that captures areas of common ground is desirable, Wallace said. We need to include an informed public as part of our vision and an open, transparent process that educates the public, he indicated.

Another element is how to manage risk and uncertainty, Wallace continued. In the vision, we should describe these in ways the public can understand, he said. Part of our vision should also be providing clarity about roles and responsibilities, Wallace said. He suggested the vision could sort out confusion about who is responsible for what.

It's important to be visionary, but we also have to meet the requirements in the Power Act for an adequate and affordable power system, Booth stated. We want to serve the region with clean renewable resources, and we need to make that statement, he said. But we also have to be realistic about things like technology and transmission, Booth said. We can't have a plan, for example, that is based on lines that do not exist, he added.

We also need to be realistic about costs, Booth continued. We need to have a place in the plan that brings the costs down to the level of the homeowner, he stated. Let's have a vision and plan that face the transmission cost and wind integration issues, Booth recommended. He added that the economics of wind now depend on production tax credits and depreciation schedules.

I feel similarly, Bruce Measure stated. I am a big fan of wind and renewables, but "the mistake in Montana has been putting all of our eggs in one basket," he said. It's time to realize that a fair competition among resources needs to occur, Measure stated. Wind has favorable treatment, and we've seen "the perfect storm" with wind, he said.

Montana is a net exporter of energy, and we intend to continue to be, Measure went on. We don't want to throw resources out of the mix, he said. Taking out the Colstrip plants would be a mistake, "especially for folks in the I-5 corridor," Measure pointed out. We want to look at ways to protect fish but not diminish the hydro system, he said. Our plan has to acknowledge that "we must wrest as much as possible from the hydro system," Measure stated.

The vision should lay out realistically what we can see for the future, Joan Dukes offered. I am particularly interested in conservation and renewables, and when I see that we could cover load growth with these resources, I am impressed, she said. I agree with Dick on the idea of F&W and power integration – we should begin to look at both pieces and do a better job of integrating them, Dukes said. I want to see innovation in our plan – "we have been pushing the envelope on conservation," and we need to keep pushing the region in the power plan, she wrapped up.



## Resource Stacking for the Plan

Morlan provided an overview of how the Sixth Power Plan is taking shape and what chapters have been completed. An updated demand forecast puts load growth at about 300 MWa or 1.3 percent per year in the medium case, according to the overview.

Staffer Tom Eckman outlined key findings with regard to conservation. He summed up his major points with three terms: “big, cheap, and pacing.” The 20-year achievable potential is now pegged at 6,000 MWa at costs up to \$100 per megawatt-hour (MWh) and 4,000 MWa at costs up to \$40 per MWh, with new measures identified in all customer sectors, Eckman reported. It will take time to develop the conservation – it’s not all available at once – and deployment will require many approaches, from changing codes and standards to carrying out research and development, he said.

What you do in the front end of the planning period can be very different from what you do at the back end, Eckman explained. Our interventions change as these processes evolve, and we need to think about that in the action plan, he said, adding that deployment calls for identifying “who’s in charge of what.”

Wallace asked whether staff takes lessons from other regions, and Eckman said the region “imports and exports” information on achieving conservation. It’s our responsibility to determine what’s best assigned locally, regionally, and nationally, Wallace commented. We need a structure in

the region to do “adaptive management” with energy efficiency, he said.

Measure asked if staff is getting input from people in rural areas who are concerned about “a one-size-fits-all” approach to conservation measures. We’ve talked to stakeholders from across the region, Eckman responded.

## Beyond Conservation

Staffer Jeff King explained the generating resource options in the plan, breaking them out in terms of availability in the near term, mid term, and long term. In the near term, he said the available resources are natural gas; local wind (that does not require new long-distance transmission); limited amounts of geothermal, biomass, and hydro; cogeneration from biomass and gas; and solar photovoltaics, which are “extraordinarily expensive.”

Additional resources are available to the Northwest in the mid term, including imported wind that requires new transmission and perhaps new coal technologies, King continued. However, he noted that coal bears a carbon risk.

In the longer term, “I’m impressed with the diversity of resources,” King said. A number of resources, including local solar, carbon separation and sequestration, new nuclear technology, offshore wind, wave, and storage technologies are not available now, so they won’t go into the portfolio, he said. But they are resources to start thinking about for 2030 – “this is where I see the vision in the plan,” King added.

He laid out actions that need to be taken to resolve near and mid-term constraints on resources, such as transmission reinforcements and operational flexibility

changes. King pointed out ways in which the region could prepare for a diversity of low-carbon options for the long-term. “We are well positioned in the Northwest to do this,” he said, adding that the region could foster commercialization of promising technologies such as wave, enhanced geothermal, and offshore wind.

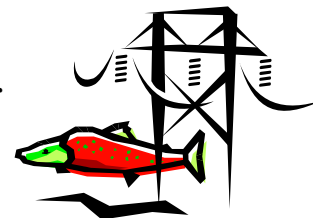
How realistic is offshore wind? Dukes asked. King explained that the Pacific Coast would require floating wind turbines because the drop-off in the continental shelf precludes stationary units, and the turbines would be more than three miles offshore. We have a tremendous resource, but it’s at least 15 years out, he said, adding that people are interested in developing the resource. Wave technology is coming on faster, and those efforts will resolve some issues with offshore generation, King said.

Morlan wrapped up with an explanation of how cost and risk are treated in modeling for a resource portfolio. Improved energy efficiency is the most cost-effective and least risky resource, he said. RPS in the Northwest require installation of most of the available wind (5,300 MW), according to Morlan, and geothermal is attractive for reasons that include reducing the carbon risk. The geothermal potential in the 20-year plan is about 840 MW at \$85 per MWh, he added.

Yost asked how much geothermal is online in the region. Today we are producing about 10 to 11 MW, and overall, there is about 1,200 MW of estimated potential, King responded. I like geothermal, but with all of the potential, we only have a small amount online, Yost commented. It may not be realistic, he said. King pointed out that the “upfront risk” has constrained geothermal development.

So far the portfolio does not address the issue of system flexibility, Morlan said. We still need to understand it, and we may tap into this issue through our treatment of integration costs for variable resources, he said.

### **The Fish and Power Nexus**



Dr. Joel Hamilton and Dr. Noelwah Netusil of the Independent Economic Analysis Board (IEAB) reported on their analysis of interactions between the Council’s F&W Program, adopted early this year, and the Sixth Power Plan. Morlan said the IEAB was asked to look into relationships between the two, a task “intended to generate ideas and survey the possibilities.”

Hamilton said the IEAB identified a number of potential interactions, including impacts of mainstem actions, such as the 2008 Biological Opinion (BiOp) and the Columbia Basin Fish Accords; increased costs as a result of the BiOp that may reduce power demand; uncertainties about mainstem improvements and spill levels; role of environmental credit markets, including carbon; impacts from integration and wind and solar generation on F&W; and impacts from changes in water storage and use.

The 2008 BiOp and the Accords will increase F&W program costs by \$90 million annually and mainstem actions will reduce revenue from generation by \$15 million, he reported. Passing the additional costs on to customers could reduce demand by up to 177 MWa in the short run and up to 472 MWa in the long run, Hamilton said.

A number of projected changes in fish bypass facilities, including removable spillway

weirs, could affect hydropower generation, as could litigation that would increase spill, he explained. This raises the question of whether it would be cost-effective to reduce spill and spend the savings on other actions, such as habitat improvement, Hamilton said.

Netusil outlined the potential role of environmental markets and how they could affect the F&W program and the power plan. With regard to the region's carbon footprint, she pointed out that BPA's F&W program has protected about 300,000 acres of land that have carbon sequestration benefits. Markets for these benefits are emerging, Netusil said, recommending the Sixth Power Plan recognize the potential they offer.

Hamilton pointed out the increasing value of the hydro system for firming variable resources, as well as constraints for doing so due to fish operations. The Sixth Power Plan needs to recognize the cost of integrating variable resources and the potential for institutional changes that will lessen the impacts to the hydro system, he said. The Sixth Power Plan is well on its way to incorporating these issues, Hamilton added.

Changes in water storage and use have implications for both the F&W program and the power plan, he continued. Idaho has proposals to study new dam sites and for increasing the height of dams, and Washington is seeing proposals for new storage, Hamilton stated. There are uncertainties about whether these proposals will move forward, but if they do, there will be impacts, he said. In wrapping up the presentation, Hamilton said many of the topics addressed would benefit from additional IEAB analysis.

Wallace listed several other areas of intersection, including more efficient turbine

installations at dams, which affect both generation and fish, and irrigation efficiencies, which provide water for both fish and power production.

Karier asked if land acquired to meet a F&W mitigation requirement would also qualify for environmental credits. There is a lot about the environmental credit markets that is unsettled, Netusil responded, adding there is much discussion going on about "additionality." If land is purchased to meet a regulatory standard, anything that is done in addition to the purchase could potentially qualify for the credit, she explained.



### **ISRP Okays Accord Projects and Council Votes to Fund**

Staffer Mark Fritsch described four projects associated with the Columbia Basin Fish Accords that have been reviewed by the Independent Scientific Review Panel (ISRP). The projects are: a Yakama Nation Pacific Lamprey Program, with a total budget of \$2,738,629; a Umatilla tribal request to expand Snake River fall chinook adult holding ponds at the Lyons Ferry hatchery for a one-time total of \$500,000; a Columbia Inter-Tribal Fish Commission Sturgeon Strategic and Hatchery Master Plan that totals \$1,643,178; and Expanded Multi-Species Acclimation in the Wenatchee/Methow basins for a total of \$4,845,345.

Booth noted that the ISRP approved the projects but put conditions on three of the four. Project sponsors will be working to have the qualifications removed, he said. We are making better progress on Accord projects, Booth added. The sponsors are collaborating, the ISRP is reviewing and

approving them, and sponsors are coming back with responses to concerns, he said.

The Council voted unanimously to recommend BPA provide funds for the four Accord projects.

**END NOTES** \_\_\_\_\_

**Helping Hand for Hardware.** The Council approved a \$64,294 funding request to replace the Northwest Habitat Institute’s aging computer equipment. The NHI develops data sets and data collection methods for F&W planning purposes. The computer system, which was due for replacement, experienced a failure with its main storage server April 7.

<b><u>Council 2009 Calendar</u></b>	
May 12-14	Walla Walla, WA
June 9-11	Whitefish, MT
July 14-16	Portland, OR
August 11-13	Spokane, WA
September 9-10	Oregon
October 7-9	Ketchum, ID
November 12-13	Teleconference
December 8-10	Portland, OR