TEISS Software Saves Tribal Air Pros Time and Effort on EIs

Tribal air programs are often short-staffed, and their funding is often tight. Despite such limitations, many tribes have made it a priority to conduct emissions inventories (EIs) on tribal lands to identify pollution sources and quantify their emissions. EIs are valuable tools for understanding the air-quality picture, framing regulatory needs, educating the community on health issues, and providing data to larger-scale projects such as U.S. EPA’s National Emissions Inventory. However, conducting the data-gathering and number-crunching involved in a comprehensive EI is time- and labor-intensive.

To help tribes generate quality EIs while making the best use of available time and staff resources, the Tribal Data Development Working Group of the Western Regional Air Partnership (WRAP) arranged for the development of a user-friendly EI software tool. Last year, the group commissioned ITEP and the consulting firm, Lakes Environmental, to develop such a tool in partnership with numerous tribal air professionals.

The resulting program, the Tribal Emissions Inventory Software Solution (TEISS), was released in April of 2004 to an enthusiastic reception by tribal environmental staffers across the nation. ITEP has conducted several TEISS training sessions over the past year, and the Institute’s Sarah Kelly and Jenifer Williams continue to assist tribal TEISS users with training and individual support.

To get a sense of how the TEISS is working for the tribes so far, we spoke with two tribal air professionals now using the software.

Jim Woods, Makah Nation, Washington State

When Air Quality Specialist Jim Woods heard in mid-2003 that the TEISS was being developed, he delayed his EI for the 47-square-mile Makah reservation, which lies at the northwestern tip of the Olympic Peninsula in Washington. A year later, Woods is using the software to generate an EI that will characterize a wide range of sources in and around this remote, mostly mountainous Indian nation.

Makah’s pollution sources include wood-burning stoves used by about 95% of the tribe’s 1700+ members living on or near the reservation (total Makah enrollment is 2356). To quantify wood-burning on the reservation, Woods contacted the Forest Service for the number of wood-cutting permits that agency has issued and learned that 2000 cords of woods are cut by tribal members each year, yielding some 35 tons of PM10 into the tribe’s airshed. In addition to resi-

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Getting the Most from the TEISS

ITEP’s Sarah Kelly, who has overseen the TEISS project and distribution of the software to some 90 tribes as of mid-September, says, “We tell people that they should first make a list of sources; if you’re at a point where you really don’t know what sources you have yet, you can go into the TEISS and look at all the calculators, which show all the source categories. So, for example, if you open the calculator for Unpaved Roads, there’s actually a little button to hit to print out the blank that you can use. It shows you what the blanks are to fill in, the data you’ll need to collect.”

The TEISS dramatically reduces time spent on EIs, but there are a couple of categories that will require extra attention: On-Road and Non-Road Mobile Sources. Kelly says, “The data comes from EPA, and it contains defaults based on counties. Its developers probably never took into account that anyone would be doing calculations based on anything but a county basis.”

This creates problems for the tribes, whose lands often overlap multiple counties, making county-based data inapplicable in its raw form. Mobile-source data is particularly complex; it is based on a stew of formulas that include average numbers, types and ages of vehicles typically using county roads, speeds at which they travel and their average pollution outputs. In raw form the data will rarely reflect the realities of

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As the Tribal Emissions Inventory Software Solution (TEISS) tool is distributed among the tribes and more and more air quality professionals begin using it to characterize the air pollution sources within tribal borders, I’m struck again at the rapid progress that the tribes are making in their technical and scientific capacity. To me, the TEISS represents yet another step up on the long ladder to tribal environmental sovereignty.

Ten or so years ago, few might have predicted that tribes would go so far so fast. Then, only a few tribes had air programs, and those were mainly in their infancies. We’ve all come a long way in the ensuing years; there has been not only a dramatic rise in the number of tribal members trained in air management but a broadening of the reach and sophistication of tribal air management as tribes have honed their expertise and have begun working with and finding new partnerships and methods of getting the job done.

Not by accident, ITEP’s progression over the past decade has followed a path similar to that of the tribes. I see our own process to this point as having moved through three phases. In the first phase, we launched and began the endless process of fine-tuning our basic program goal, that is, providing training and support to the tribes to help them build environmental-management capacity. That began with the creation of a handful of basic air courses that gradually blossomed into the full roster of air training courses that we presently offer, as well as an array of technical- and professional-development support activities that we continue to refine and expand. That phase in our development will continue to be crucial as tribes move at different rates along the path to environmental self-determination. We will always hold training and support as primary goals.

The second phase in ITEP’s growth came with the founding of the Tribal Air Monitoring Support (TAMS) Center in Las Vegas. When the TAMS Center began providing direct air-monitor training and support for tribal air professionals, we entered more fully into the hands-on phase, one that we had sidled into to a smaller degree in some of our course offerings. The TAMS Center continues to offer a wide range of monitoring-skills training courses, and our staff there have offered on-site support for numerous tribes on issues ranging from monitor placement to radiation detection efforts.

With the TEISS software, we now enter what I consider a third phase of our work. In partnership with the Tribal Data Development Working Group of the Western Regional Air Partnership (where the idea of emissions-inventory software for the tribes originated), we have now contributed to the development of a powerful tool designed specifically for tribal air professionals. Once developed, tools such as the TEISS will always be around, regardless of the level of support that the tribes might receive in our trust relationship with the federal government. Creating other such tools will continue to be an emphasis in our efforts as we move forward.

The TEISS was designed with the help of a number of tribal air professionals to meet truly tribal-specific needs—the major need being time, which is always in short supply for perennially under-funded and under-staffed tribal air programs. As such, it represents a true partnership between numerous entities: the tribes, a regional planning organization, U.S. EPA, a private contractor, and ITEP. Its effective use will in some cases require further collaborations with additional entities, such as states and counties, which often possess data that is crucial to the TEISS’s number-crunching. Therein lies what I think is another aspect of the phase we are in presently: encouraging collaborations between tribes and others who can assist the tribes in their environmental-management capacity-building.

The importance of such collaborations cannot be overstated. With the flattening of U.S. EPA budgets in the past few years and the diminishment of environmental progress in the U.S. that has resulted, finding ways in which the tribes can reach out and find partners to help us continue our capacity-building is crucial.

At ITEP, we will continually seek to find new opportunities for such collaborations, staying mindful of the importance of tribal sovereignty in any such collaboration. As recent world events have shown, building partnerships in any endeavor is essential to success. Given our rapid development in professional and technical capacity, we are approaching the point where we can enter into collaborations with virtually any other entity as equal partners. To me, that is something for which we can all be very proud.
Woods began gathering much of the data before the TEISS software came online, but he put off the actual calculations for about a year, anticipating the time savings he would enjoy by using the TEISS.

He’s glad he made that choice—the amount of time he has saved, he says, has been “enormous. The more I work with the TEISS, the more I like it. It seems fairly user friendly, and I’m sure it’ll get simpler as they make further improvements. It seems to have nearly all the necessary categories. There are a number of models built in; I haven’t pursued too much of that yet. Like for solid waste landfills, there’s a model called LandGem that I haven’t yet had the pleasure of using.”

Offering advice to other potential TEISS users, Woods says “I think the primary focus in the beginning should be the Inventory Preparation Plan (IPP). However, I think before someone starts collecting all the data to input into the TEISS, you really need to look at the TEISS first to see exactly what’s needed. I have to go back and recalculate the amount of rainfall up here, for example, which is well over 100 inches per year. The TEISS asks, ‘How many days does it rain?’, but [EPA’s] AP-42 asks ‘What’s the annual precipitation in inches?’ So there’s some variation. I go into the calculator portion of the TEISS in advance and print out what the actual questions will be and attach that to my hard-filing system.”

Woods stresses his gratitude for ITEP’s Sarah Kelly and Jenifer Williams “for all the work they’ve done on this. They have provided an incredible amount of help. The TEISS isn’t something you can jump into with both feet. They really helped me to get off the ground on this. They’ve never hesitated to find a solution and get back to me.”

Brandy Toft, Leech Lake Band of the Ojibwe Tribe

Air Quality Specialist Brandy Toft says, “I was progressing as the TEISS was progressing,” giving her a unique perspective on the software as it was being fine-tuned for tribal needs. One of numerous tribal air professionals who helped to shape the TEISS through a series of trainings and feedback sessions, Toft makes up, in terms of total staff-time available, two-thirds of Leech Lake’s air team. She says doing an EI has been an important goal since the program began in 2001, but other environmental priorities, as well as staffing limitations, caused her to hold off on the EI. “I put it off for probably a year and a half,” she says. “But I was gathering data before the TEISS came out so that I wouldn’t have to use anyone else’s data. I was getting what I could—you have to have the data. I was getting a lot of area-source data, nibbling on other things, trying to get information on major sources, looking on the Internet to see what U.S. EPA and the Minnesota Pollution Control websites had and how accurate it was.”

As she anticipated the TEISS’s arrival, Toft attended several trainings. “We got our first look at it in July of 2003, when a bunch of tribes came and just played with it, not taking any data, just seeing how it worked, looking for bugs, looking at how to make it better. We started our EI when Sarah Kelly came here for a TEISS site visit
AIAQTP Training Courses for FY2005

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*A Professional Assistance specialty course. Call the TAMS Center (702-798-2224) for more information.

Native Voices
Summer Interns Gain Crucial Real-World Experience

2004 proved to be another successful year for ITEP’s Summer Internship Program. The program, sponsored by ITEP’s American Indian Air Quality Training Program, provides Native American and other students with opportunities to assist governmental and tribal environmental offices throughout the U.S. with special, hands-on projects. The internships help to increase students’ understanding of real-world professional activities as well as work options in their field of choice. The ten-week internships run from approximately June through August each year. Student interns are provided with a stipend and housing and travel allowances.

Intern Jose Almanzar, a student at State University of New York–Binghamton, was assigned to the Federal Air Rules for Reservation Communications under EPA Region 10, Office of Air Quality, State and Tribal Programs Unit, Seattle, Washington. Loni Bernally-Holyan, a Phoenix College student, was assigned to National Tribal Air Association Tribal Air Policy Support Project under the National Tribal Environmental Council, Air Programs, in Albuquerque, New Mexico. Johna Boulaferentis, a student at Dickinson College, assisted with the Air Quality Education and Outreach Project Support under the Nez Perce Tribe Environmental Restoration and Waste Management Program, and also the Air Quality Project at Lapwai, Idaho. Jacey McCurtain, a graduate student at Northern Arizona University, was assigned to the Center for Sustainable Environments working to support resource development activities of environmental programs at Flagstaff, Arizona.

Tony Mo, a student at State University of New York, interned with the Styrene Monitoring Project under the St. Regis Mohawk Tribe Environmental Division at Akwesasne, New York. Jonathan Nez, a graduate student at Northern Arizona University, was assigned to the Arizona Department of Environmental Quality to assist in research, education, and financial assistance for tribal governments throughout Arizona. Luke Pelz, a graduate student at the University of Iowa, interned with a Navajo EPA program known as the Health Effects from Oil Field Operations on the Navajo Reservation Project.

The internship was sponsored by Navajo Nation EPA, Air and Toxics Department, Air Quality Program, at Fort Defiance, Arizona. Jaime Pretty On Top, a student at Salish Kootenai College, worked on the Smoke Management Project under the Nez Perce Tribal Environmental Restoration and Waste Management Program, Air Quality Project at Lapwai, Idaho.

For more information on student applications, or to submit internship proposals, please visit the ITEP website at www4.nau.edu/itep/ or contact: Graylynn Whiterock, Internship Program, Institute for Tribal Environmental Professionals Environmental Education Outreach Program P.O. Box 5765, Flagstaff, AZ 86011, Phone: (928) 523-8785; Fax: (928) 523-1280; E-mail: gw2@dana.unc.nau.edu. Completed student application packets and project proposals must be received by March 31 of each year.

Recentely, the Flagstaff, AZ, community had an opportunity to learn about sustainable energy sources at the Sustainability Expo, held on the campus of Northern Arizona University (NAU). Over 50 vendors provided information for visitors from all over the Southwest. The EEOP staff, representing ITEP, provided fun learning activities for the youth and families.

Participants assembled a fuel cell / solar car, learning how water and a little sunlight can create fuel. Solar energy provides electricity for an electrical motor or to separate water into hydrogen (fuel) and oxygen. When there was no sunlight, the on-board fuel cell recombinited hydrogen and oxygen to produce electricity for the electrical motor.

Participants were also challenged to build a working wind turbine. They learned how magnets and coils of wire can generate electricity. Wind pushes the turbine blades, providing the energy to create electricity.

All participants were encouraged to consider alternative energy sources, such as solar and wind, to help protect our air quality and reduce impacts on our climate.

For more information about learning activities on renewable energy sources, call Mansel A. Nelson at 928-523-1275 or contact him by e-mail at mansel.nelson@nau.edu. The EEOP website (http://www.nau.edu/eeop/) also provides information on teaching about alternative energy.
WRAP Employing "Representative Communities" Approach to Characterize Air Quality in Rural Alaska

Filling data gaps is a high priority for organizations and agencies seeking to understand the big picture of air pollution over broad regions. For the Western Regional Air Partnership (WRAP), a collective of states and tribes working to reduce regional haze in and around Class I areas, Alaska’s air-pollution picture has long been obscured by a lack of quality emissions data.

Alaska joined the WRAP in November 2001 and is responsible for quantifying emissions in and around four Class I areas within its borders (Alaska has many more parks, forests and monuments, but only four meet conditions set under the Clean Air Act when its regional-haze regulations were set forth). Composed of 14 states and 14 tribes, the WRAP is a regional organization working to achieve federal haze-reduction requirements for its members.

To remedy the data gap in Alaska, while also conserving scarce funding and available labor time, the WRAP is launching a new data-gathering effort based on emissions surveys on “representative communities” across the state.

Phase 1 of the project involves gathering survey information in 15 carefully selected Alaskan villages and small towns (one survey during warmer weather, one in cold weather), then generalizing that data to broader areas, such as counties, across the state. With 57% of its population centered in 45 mid-sized communities (pop. 2000 to 59,332) and 329 small communities (less than 2000), a full survey would be prohibitively expensive and labor-intensive.

Coordinated by the WRAP’s Emissions Forum, the survey project is designed to yield a more accurate picture of Alaska’s air quality than would EPA’s “default” models used to approximate emissions in rural areas. WRAP Emissions Co-Chair, Alice Edwards, says, “We were hesitant to rely on emissions defaults coming out of the federal EPA for our communities, because we have significant differences in modes of transportation and other activities in AK compared to the Lower 48 states.” Alaska village pollution is heavily impacted by sources such as snowmobiles and all-terrain vehicles, burn barrels, diesel generators and other technologies needed in their often extremely remote locations.

The first step in determining pollution levels and impacts on a community is the emissions inventory (EI), which is assembled by surveying all an area’s sources and quantifying the pollution output. Through the work of contractor Sierra Research, the survey will be based on careful consideration of regional differences and commonalities. Sierra Research will enlist the services of ANCET (Alaska Native Coalition on Employment and Training) to coordinate data collection in the villages.

Once the information is collected it will be interpreted, EI estimates will be generated, and the findings and their significance will be shared with each local community. The data will also be included in the statewide EI and/or U.S. EPA’s National Emissions Inventory database.

The Alaska project—a new approach to doing inventories on pollution sources—may provide the structure for a similar surrogate-community approach to doing EIs in rural areas in the Lower 48 states.
ITEP's Alaska Solid-Waste Training Program Poised To Move in New Directions

By Jennifer Williams
ITEP Alaska Solid Waste Program Manager

ITEP's efforts to provide solid-waste training and support to Alaska natives is entering a new phase in which ITEP now has a physical presence in Alaska.

Jennifer Williams, who until recently worked with the American Indian Air Quality Training Program in Flagstaff, Arizona, has moved to Anchorage and has assumed the position of Solid Waste Program manager. After four year of developing a successful solid waste training program in Alaska, John Roanhorse, the previous program manager, is refocusing on environmental compliance and inspection training and support. Mr. Roanhorse will continue to attend solid-waste planning and course development meetings and provide course instruction at one of the four courses to be offered in Alaska next spring. ITEP’s research specialist, Todd Barnell, will continue to support the solid waste training courses, making Ms. Williams’ transition as smooth as possible.

ITEP took this transition opportunity to open a solid-waste office in Anchorage, Alaska, allowing for easy access by collaborators and people from the villages who attend conferences in Anchorage.

The Anchorage office may make ITEP more accessible to Alaska natives and others in the state, but it does not automatically ensure insight to village needs, particularly because living in Anchorage offers all the luxury of solid waste services offered in the lower 48. So although ITEP now has a presence in Alaska, Ms. Williams has been working hard to understand the unique solid waste issues of Alaska natives in the remote villages. Her efforts include communication and collaboration with villages, corporations, non-governmental organizations, and governmental agencies that have been working toward solid waste solutions throughout Alaska.

Throughout the state, interested individuals are working together to plan for solid-waste training in the upcoming year. Some of the organizations ITEP has been in contact with include Alaska Native Health Board (ANHB); Yukon River Intertribal Watershed Council (YRITW); Alaska Forum on the Environment (AFE); Central Council Tlingit and Haida Indian Tribes of Alaska (CCTHITA); Zender Environmental Planning and Science; Rural Alaska Community Action Program, Inc. (RurAL CAP); Rural Community Assistance Corporation (RCAC); Council of Athabascan Tribal Governments (CATG); 7 Generations; and Alaska Inter-Tribal Council (Al-TC).

Representatives from these organizations attended ANHB’s 10th Annual Alaska Tribal Conference on Environmental Management in October 2004. ITEP will help to bring these organizations together to meet and work out a master plan for future environmental training in Alaska.

Over the past decade, environmental professionals in villages throughout Alaska have made great strides in solid-waste management. These villages will be great assets in terms of learning and collaborative sharing of information.

ITEP has been contacting environmental professionals in the villages to integrate their experiences into some of the solid-waste management training efforts already in place. Collaborative efforts of ITEP and the villages continue to improve solid waste courses offered in Alaska.

ITEP will coordinate regional workgroups to fine-tune for local needs solid waste courses offered in 2005.

If you are an Alaska resident with solid waste concerns and have not heard from ITEP recently, please feel free to call Jennifer Williams (907-349-2163) to update us on your solid-waste efforts or to request assistance.

We are very excited about the new opportunities that this transition will offer to both Alaska natives and ITEP staffers. Please don’t hesitate to contact us with ideas, questions and comments.

A black bear assaults a bearproof trashcan outside the Anchorage home of Jennifer Williams, ITEP’s Alaska Solid Waste Manager. Photo courtesy of Jennifer Williams.
Kelly—from front page

a tribe’s roadways and non-road activity; for example, the tribal “fleet” may include older, more rural-types of vehicles that may be driven more or less often than the county “average.”

Kelly says the programs for these source categories generate emissions factors; the user’s job is to take those factors and multiply them by the number of vehicles actually used in a particular jurisdiction. She says a first step might be to “check what the state has done and ask yourself if you can use what they’ve done or whether you should do something different.” Mobile source categories may require extra effort and, where available, assistance from state or federal sources. Kelly points out that exploring potential assistance from outside sources can yield a big payoff in time and effort.

Kelly hopes to organize a networking session among tribes at the upcoming International Emissions Inventory Conference, to be held in Las Vegas next April. “I’d like to have a half-day meeting for tribes doing EIs, about to do EIs, or thinking about doing EIs, where everyone could get together, maybe have a couple of presentations from tribes who have already been through it, and just discuss the issues, problem-solve, and have people learn from each other. It will be a good event for the one-year anniversary of the TEISS’s release.”

TEISS—from front page

... and debugging in November of 2003, then I worked on it in bits and pieces, then really hammered it in at the last training at Fond du Lac in July. I got lots of support during the training and got lots of questions answered directly on Leech Lake.”

Some of the sources Toft has addressed in the EI are forest roads—Leech Lake, she says, has more miles of Forest Service roads running through the reservation than any other tribe. Leech Lake also has such diverse sources as natural gas and crude oil pipelines, and a coal-burning utility plant.

Leech Lake occupies portions of four counties, making the use of county-based data difficult. “I haven’t dealt with mobile and non-road yet,” she says. Although she was nearly finished with the EI as of early September, she says, “We’ll probably ask [a regional planning organization] for help on mobile and non-road. I don’t see Leech Lake’s program of 1.5 people learning Mobile6 and all the other stuff when there are people out there who have offered to help.” Support is really important, especially for mobile and non-road.”

Toft is pleased with the software for the clarity and ease with which it can be used. “It’s right on the dot for the tribes; everything was there, or close enough that we could use it.” She is especially impressed by the software’s outline feature. “It shows you the source, then the emission units, then the emission periods, then the emission controls and the actual emissions. It just lays it all out for you, so you start to understand the concept of how the facility works. So you get an understanding of the big picture, from the emissions back to the source and all the steps in between. You can’t get that by hand.”

She is also enthused about the time that can be saved using the software. “It’s astronomical,” she says. “I have one source that has 30 emission units. By hand I would be redoing and redoing the calculations to make sure they were correct, making sure the math was right—but the calculator in the TEISS does it all for you.” Doing that source by hand, I can’t tell you how long it would take—and that’s just one source!”

Users of the software would do well to “take the training, first and foremost,” she says. “And break out those calculators and use them to gather data. And give yourself time. That’s the major resource you’ll need. Doing an EI doesn’t cost you money except for wages. What it does is takes so much of your time.”

Toft says the tribe will likely submit its final EI to the national EPA inventory. “And we’ll just look at the data it gives us. We’ll evaluate it, determine whether we have any problems that we didn’t know we had, whether we’re missing out on any important monitoring. The TEISS is a great tool. They were telling us it would save a huge amount of time. They were telling the truth.”