Training Tribal Environmental Professionals: Using a Project, Not a Projector -- an Update

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ABSTRACT

In 1998, Northern Arizona University's American Indian Air Quality Training Program (AIQATP) developed a two-and-a-half-day course to provide tribal environmental professionals with advanced training in emissions inventory. Case projects formed the core of the course, supported by specific content or activities necessary to ensure that the projects could be completed. The case projects and their supporting activities were selected to be appropriate and relevant for most reservation lands. Based on instructor and participant evaluation, the course underwent revision after its first offering. The revised four-day course has now been delivered twice. This paper updates and describes the evolution of the course, its success in training participants in emissions inventory work, and recommendations for the future.

INTRODUCTION

In a partnership with the United States Environmental Protection Agency (EPA), Northern Arizona University (NAU) has established the American Indian Air Quality Training Program (AIAQTP). Seeking to fulfill the mandate of the 1990 Clean Air Act Amendments to offer tribes full partnership in managing air quality on tribal lands, the AIAQTP offers training that acknowledges and is sensitive to the vast cultural heritage of Native Americans.

All of the courses offered by AIAQTP include the following characteristics:

- Native American values and context.
- An instructional team that includes experienced tribally-oriented environmental professionals.
- An emphasis on visual and verbal learning.
- Hands-on experience using in-class or field activities.

The purpose of ITEP's advanced courses such as Emissions Inventory is to *train-by-doing*. This heavily influences how such a course is structured and delivered.

During 1998, two courses, Emissions Inventory (EI) and Air Monitoring Network Design (AMND), were developed and offered to tribal environmental professionals. The two workshops were offered back-to-back during a six-day period from August 10 through August 15, 1998. The outcomes of these courses were previously reported on in 1999 (Baxter and Ramirez, 1999).

Course Format and Structure

The purpose of the EI course was to provide tribal environmental professionals with the skills necessary to complete an EI. This was accomplished by a) establishing the regulatory framework of emissions inventories, b) developing case projects in which the participants could gain hands-on experience gathering information for emission calculations, and c), compiling data for reporting and management purposes. In addition, tribal environmental professionals versed in EI development were invited to serve as instructors along with AIAQTP personnel. Participants completed a pre-course examination, a post-course examination and an evaluation so that course effectiveness could be evaluated of recommendations made.

During the first day of the EI course instructors presented background information on the regulatory basis and use of the emissions inventory, as well as basic information on the importance of planning an emissions inventory. Two group activities and two discussion sessions were also included. The first activity provided participants with an introduction to the AP-42 (U.S. EPA, 1995) and how it can be used during the planning process to help establish data needs. The second activity, consisting of separate activity stations, presented and demonstrated various useful software tools that can be obtained from the US EPA. The Office of Air Quality Planning and Standard's Technical Transfer Network Web site (TTNWeb) and the procedures for finding and downloading documents, or software, from the site were also demonstrated. The first discussion session focused on the current status of tribal emissions inventories, emission sources and source concerns. The second provided an opportunity to share and discuss the experiences gained by two very different tribes having conducted two very different emissions inventories. A tribal instructor moderated both of these discussion sessions.

At the beginning of day two of the EI course, five different work groups were formed and a sequenced, five-part activity designed to progress each group through the process of conducting an emissions inventory was begun. Each group was responsible for completing the various parts of the activity as a means of conducting the emissions inventory case project. The makeup of each group was largely based on the participants interest in the particular source of a case project and its applicability to their own reservation.

The EI course activities used to progress participants through the sequence of steps necessary to complete an emissions inventory are presented in Figure 1.

Case Projects

Unique to this first course offering was the implementation of case projects, which not only provided tribal participants with hands-on experience in gathering information and calculating emissions, but were projects relevant to sources existing on tribal lands. Case projects for the first workshop included small external combustion sources, residential wood stoves and fireplaces, paved and unpaved roads, sanitary landfills and a hot mix asphalt plant. Local facilities (the NAU boiler plant, the City of Flagstaff Cinder Lakes Landfill, and the hot mix asphalt plant) participated by offering tours and process information. At the facilities, the participants were encouraged to ask questions and fill out forms that would assist them in calculating emissions.

Conducting fieldwork on the number of wood stoves and fireplaces could not be accomplished by the students in a short amount of time so information was provided to them by the instructors. For the paved and unpaved roads project, students collected dirt samples from local paved and unpaved roads. They also conducted a brief traffic count to determine approximate vehicle miles traveled (VMT). At the NAU soils laboratory, they followed AP-42's procedures for determining silt load (sL) and silt content. With this information, they were able to calculate emissions for particulate matter less than or equal to 10 microns (PM10).

To fully accomplish the case project objectives, EPA guidance documents, software, and access to computers were made available. Finally, each instructor was also assigned to a single case project so they would be more effective in assisting with any questions or problems that arose.

Instructional Team

Selecting and coordinating with instructors whose experience and background match the demands of the course is important. An instructional team that includes at least one tribal instructor teaches each AIAQTP workshop. Tribal instructors are environmental professionals who work for tribes and have gained expertise in a field related to air quality. This unique approach lends tribal perspective and relevance to the courses. In several workshop evaluations, the participants have conveyed that they identify with what tribal instructors present and discuss. They also have indicated that they feel motivated by the tribal instructors' accomplishments in air quality.

Finally, because the project-based specialty courses are structured to have the participants work on real and relevant project activities, the ability of an instructor to be an effective coach is also important. In general, the desirable characteristics of an instructor are as follows:

- Knowledgeable about the course topics, resources and software tools.
- Aware of and able to present information that is relevant to tribes.
- Aware of Native American culture and an understanding of how to tailor a presentation style to enhance communication.
- Able to guide participants effectively through a complex activity rather than control every step, procedure or decision.

Participant Evaluation of Courses

Upon the conclusion of the course, participants were asked to complete a course evaluation. The course evaluation form provides for participants to directly comment and to rank, from 1 to 5, certain course attributes. Results from these evaluations are used directly by the AIAQTP for making improvements in future course offerings.

The following representative statements summarize comments from the EI participants.

- Approximately 80 percent of the participants responding felt that the course fulfilled their expectations.
- The "hands-on" activities in the EI course were considered very effective and useful.
- During the EI course essentially all participants felt that the interaction between the instructors and participants was effective.
- The most positive aspect of the EI course was cited as being the hands-on activities.
- Participants felt the EI course should be separated from the AMND course and last longer than two and one-half days. This additional time would allow participants to work on more than one emissions inventory case project.

Revisions

The content of the initial EI workshop was valuable and provided the participants with a good foundation for developing their respective EIs. It was revised in order to separate the EI workshop from the Air Monitoring Network Design (AMND) workshop and increase the number of days for the EI workshop.

In June 1999, the second EI workshop offering was expanded to four full days. The number of tribal instructors was expanded to four individuals. The first day was comprised of an overview that defined the EI, how sources are categorized, federal regulatory requirements, additional end uses of an

EI and basic steps in preparing an EI. Tribal instructors also explained how they conducted EIs for their respective tribes, the obstacles they faced, and the successes in completing their EIs. An activity introducing participants to available EPA software and planning tools followed the lectures.

On days two and three, the participants were assigned to *two* case projects and given the liberty to obtain information, conduct fieldwork, and calculate emissions on their own. Again, they were given access to site-specific information, computers and EPA guidance documents. Concrete block manufacturing and prescribed burns/wildfires replaced the wood stoves/fireplaces and sanitary landfill projects. Also, on day three, participants were asked to finish calculations and begin drafting a report of their projects using Microsoft PowerPoint.

On day four, participants finalized their reports and each project group gave a presentation to the class. This was informative since the presentations gave the participants the opportunity to see other projects that were conducted.

In June 2000, the EI workshop followed the same format as the previous year. The number of tribal instructors was decreased to two individuals. The number of ITEP instructors increased from one to three individuals. On day four, following presentations from participants on their projects, a focus discussion was added regarding contract management issues.

CONCLUSIONS

The AIAQTP emissions inventory workshop has been offered three times since 1998 and has progressed into a four-day workshop. The emphasis has been and continues to be, on case projects which provides participants with the opportunity to *train-by-doing*.

As more tribes engage in the development of emissions inventories, issues are beginning to arise such as EPA's quality assurance/quality control (QA/QC) requirements and what content tribes should include. The issue of when a quality assurance project plan (QAPP) is required for an EI also needs to be addressed. These discussions need to occur on a national and regional basis between tribes and EPA. As for content of emissions inventories, it appears that many tribal EIs concentrate on area and mobile sources. The majority of point sources are located off-reservation, though they pose potential impacts to certain reservations.

Future offerings of the EI workshop could include a section on basic QA/QC procedures to consider when conducting an EI. As communication becomes more established between EPA's Office of Air Quality Planning and Standards (OAQPS) and ITEP, perhaps more EPA staff could serve as instructors (for this course) to offer guidance on these issues.

REFERENCES

Baxter, T.E.; Ramirez, B.B. *Training Environmental Officials: Using a Project, Not a Projector*, Presented at the 92nd Annual Air & Waste Management Association Conference, St. Louis, MO, June 1999, paper 99-468.

KEY WORDS

Case Project
EI workshop
Emissions Inventory
Training
Train-by-doing
Tribes
Tribal environmental professionals
Hands-on experience

Figure 1. Sequence of activities in Emissions Inventory course designed to facilitate the learning process for completing a project.