

National Spatial Data Infrastructure Cooperative Agreement Program

EPA and Partners Geospatial Metadata Implementation Project

Final Status Report



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NSDI CAP Coordinator
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Submitted by:

Innovate!, Inc.
5835 Valley View Dr.
Alexandria, VA 22310
774.206.5549
jzichichi@innovateteam.com

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Organization:

Innovate!, Inc.

5835 Valley View Dr.

Alexandria, VA 22310

<http://www.innovateteam.com>

Principal Investigator:

Jessica Zichichi

774-206-5549 (office/fax)

774-487-0445 (cell)

jzichichi@innovateteam.com

Collaborating Organizations:

Environmental Protection Agency

Michelle Torreano

Environmental Protection Specialist

USEPA Office of Environmental Information

Email: Torreano.Michelle@epa.gov

Phone: 202-566-2141

Washington, DC

<http://www.epa.gov>

State of North Carolina Department of Environment and Natural Resources (NC DENR)

Randy Moody

Project Management Officer

Information Technology Services Division

NC Department of Environment and Natural Resources

Email: Randy.Moody@ncmail.net

Phone: 919-715-0373

Executive Summary

The EPA and Partners metadata training project achieved significant results during its performance period. Between August 2008 and October 2008, the project team conducted 7 training sessions (6 web-based and 1 on-site), reaching close 200 participants from over 20 states and 30 organizations. Because six of the seven sessions were web-based, the project team was able to reach a very wide audience, with groups ranging from federal agencies, to states, tribes, counties and private companies. It is anticipated that the number of individuals that actually received training through the project is quite a bit higher than the reported number since many organizations broadcast the training to multiple individuals simultaneously.

In addition to the basic training elements provided by the project, the trainers also conducted outreach and provided materials for individuals who may not have been able to attend the sessions. First, training videos were created and provided through EPA's website for any individual to access (www.epa.gov/geospatial/eme.html). Next, the trainers provided a presentation at the 2009 ESRI Federal User's conference that summarized the training and its key take-home messages. Finally, an article was written for *ArcUser* magazine that provided some key steps for streamlining metadata production (currently available at <http://www.esri.com/news/arcuser/0309/files/5metadata.pdf>). These additional outreach efforts provided a mechanism for making use of the information developed for the training series and continuing on-going metadata education and outreach.

Another significant outcome of the EPA and Partners Metadata Training Project was the development of a draft metadata implementation for the North Carolina Department of Natural Resources (NCDENR). Prior to this project, NCDENR did not have an implementation for their agency. As a result of this training, they developed a needs assessment and draft implementation specifying which elements are important to their agency and specific wording for certain elements. This implementation will be FGDC compliant and Geospatial One-Stop (GOS) compliant. It is evolving into an agency-wide geospatial metadata implementation and template that will be used to standardize metadata file generation across their agency.

Overall, the project team found that numerous individuals were very eager to participate and obtain follow-up on the sessions. Many individuals indicated that they were going to reuse the information to train their personnel on metadata production and improving their metadata work flows. Because the project offered training to any individual from any organization, the team was able to capture the general trends of interest in various metadata topics. Follow-up from and participation during the courses indicates that a number of attendees found the training to be extremely useful and are planning to incorporate the tools and information into their workflow activities (see Appendix A. User Feedback for additional details on the feedback received).

Project Narrative

The EPA and Partners Metadata Project consisted of three distinct classes; Introductory (focusing on standards, creating metadata, tools, and catalogs), Intermediate (review of standards, the EPA Metadata Editor [EME] tool, implementations, catalogs and sharing, contributing data to clearinghouses), and Using the EME 3.0 (how to use the EME, how the EME has been updated and enhanced, how the database is accessed and customized). Each of these classes was offered twice so that attendees would have multiple opportunities to fit a class into their schedule. The venue for these training sessions was a combination of web-ex and teleconferencing which was a huge success and allowed an unlimited number of attendees to participate.

Attendees were recorded from Alaska, to Florida, to Guam, as well as within parts of Canada. A map showing participation by state/country is shown in figure 1. Individuals from federal government, international groups, state government, tribal organizations, local government, and private companies attended. Attendees ranged from GIS Analysts to Project Managers, with backgrounds ranging from metadata expert to novice. The attendees in the series displayed a high level of interest in learning about the topics and applying the tools and techniques to their business processes. Many parties were interested in ensuring that they would be "registered" for the courses

before they filled up in order to guarantee that they would not miss out on the opportunity. Additionally, many organizations broadcast the training to their teams in a conference room setting in order to ensure that all team members could participate. The first training session recorded over 70 attendees, with many individuals broadcasting the training for their organization. Attendees were recorded from Alaska, to Florida, to Guam, as well as within parts of Canada. Individuals from federal government, international groups, state government, tribal organizations, local government, and private companies attended. Attendees ranged from GIS Analysts to Project Managers, with backgrounds ranging from metadata expert to novice.

The onsite training was provided at EPA's Headquarters offices in Washington, DC and covered all topics that were offered for the web series during the course of a day. A total of six (6) attendees were present at the onsite session. Overall, the high number of attendees at the training sessions and the enthusiasm observed for the topics was much greater than originally anticipated and speaks to the current level of interest in metadata within the GIS community at large.

The project also offered post-training consultation follow-up to help individuals with their specific metadata records and problems. A number of folks took advantage of this opportunity and inquired with the trainers about specific topics. The trainers found that many users were interested in EPA's customized WAF and, in response to this interest, EPA agreed to share the code developed for this WAF with those individuals. A number of others were interested in specific GOS requirements and FGDC compliancy requirements. The follow-up provided through the training resulted in additional education for a number of users and hopefully improved the ability for individuals to contribute to GOS.

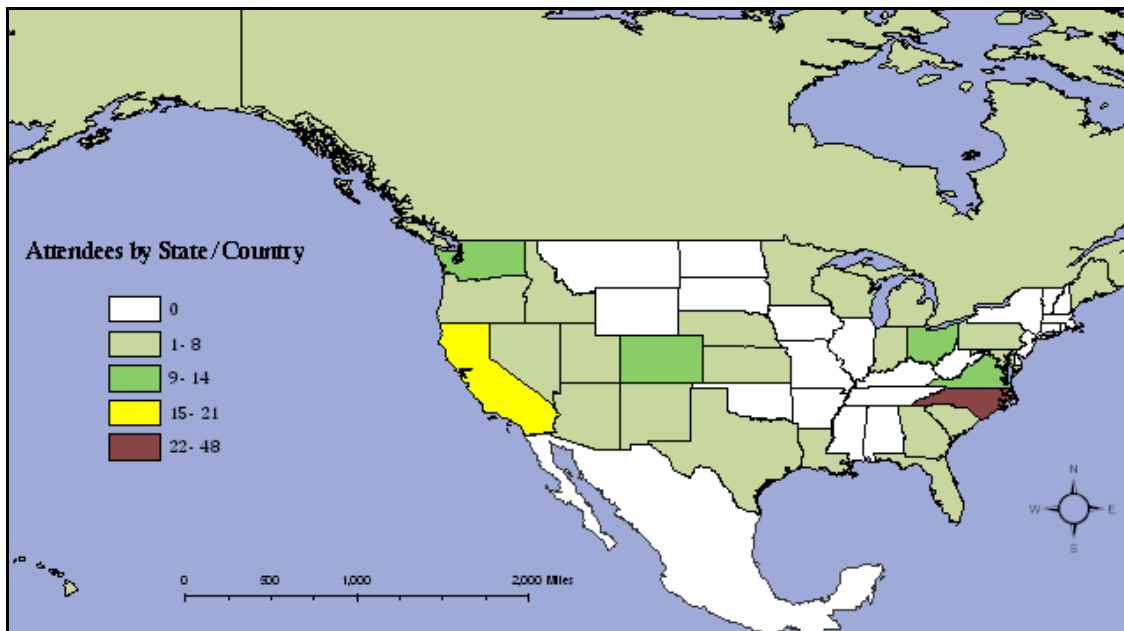


Figure 1. EPA and Partners Metadata Training Attendees by State/Country

Collaboration activities included working with the North Carolina Department of Natural Resources to develop an implementation for their agency and working with the EPA to educate their staff on the EME (v2.1 and v3.0). In addition to being successful in working with these agencies, multiple other agencies (educational, private, federal, and state) were shown how to customize and use the EME as a tool to suit their specific agency needs.

Some of the challenges faced in conducting the sessions included providing appropriate content for a varied group of individuals (different backgrounds, skill-sets, and interests) as well as ensuring that all attendees on the web-based sessions were able to work with the technology without problems. Additionally, the trainers were caught a little off-guard by the overwhelming email response received

from the announcement. Responding to and coordinating with all respondents was more challenging than originally anticipated.

Training and outreach assistance:

- Three distinct classes were offered and each class was offered twice for a total of 6 training sessions. The classes were held as individual web-ex and teleconferences lasting 2 hours in duration per class. There was also one hands-on session offered at EPA Headquarters on October 21, 2008 which was approximately 6 hours in duration.
- Organizations receiving training were Federal, State, academic, and private agencies.
- There were 186 individuals who registered for one or more of the web-based training sessions. The actual number of individuals receiving training is greater due to attendees meeting in an agency's conference room and logging into a single computer while multiple attendees received the training. There were 6 individuals who attended the hands-on session in Washington, DC.
- The level of competency of the trainees ranged from this being their first introduction to metadata to experienced metadata creators and programmers.
- The means of instruction were lecture, exercises, and computer assisted. All attendees were given access to training materials including PowerPoint slides and sample files.
- Attendees were also encouraged to participate in Metadata Jeopardy, which helped to ensure that individuals were staying awake.
- Post-training follow-up and consultation was provided by email and phone.

Status of Metadata Service

- Metadata is currently served from EPA's ArcIMS Metadata Service, its Z39.50 node, and its web accessible folder. These are all available at <http://geodata.epa.gov>.
- It is difficult to estimate specifically how many metadata files have resulted from the training due to the breadth of individuals included in the sessions.

Next Steps:

- The project team will continue to point individuals to the resources developed through this effort as additional metadata work is performed within other projects
- The project team will reuse the contact information for broadcasting some training that will be developed for the next CAP project that will be undertaken by a majority of the group (CAP 2009 Category 2)
- The project team will also seek to institute a training web series or program that will build upon these efforts. The scope of, venue and funding for such an effort is yet to be determined.

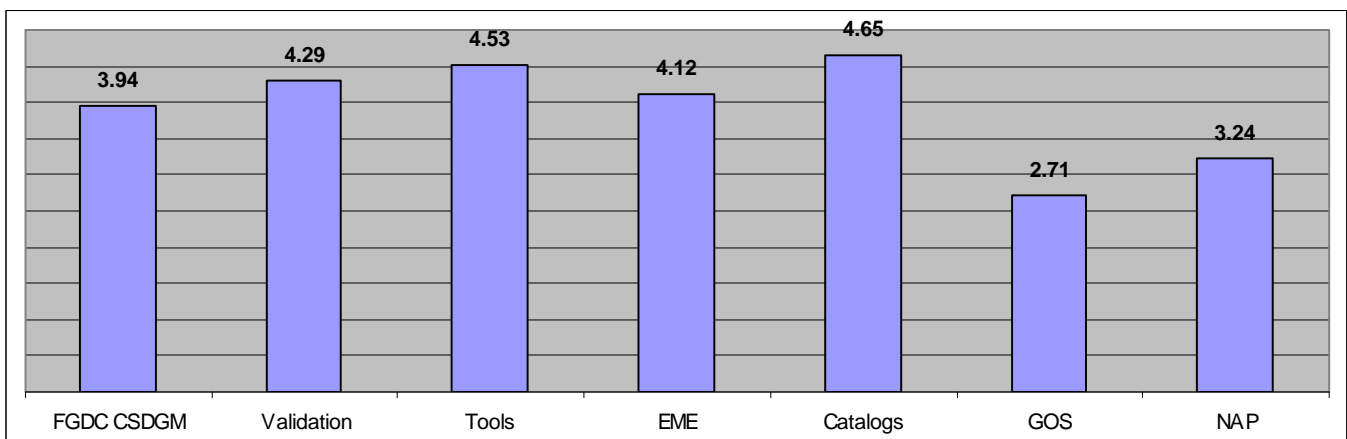


Chart 1. Pre-training Survey Results: Average attendee interest in topics offered in the training sessions (1=lowest and 5=highest).

Sample User Feedback from the Sessions:

The project team solicited post-training feedback from individuals. The entire summary of post-training surveys is shown in Appendix A, but some notable quotes are listed below:

"Thank you for creating very user-friendly training resources for this great software!! Thank you for all the work that has gone into this project. I have found it very helpful and I have even given a presentation to our local GIS User's group on the EME with directions to your wonderful website and I have had very favorable feedback so far."

"I would like to express my appreciation to you, your firm, and EPA for making this training so readily available."

"It has increased the efficiency of creating metadata in my role as GIS coordinator. This is noticeable in two areas: Our data is now more likely to have quality metadata, and I am now able to use time that would have been spent developing metadata working in other areas of our GIS program."

Feedback on Cooperative Agreements Program

- **What are the program strengths and weaknesses?**
 - I believe that the program is very strong overall and I was very happy with the responses and interaction I had from all of the CAP leadership.
 - In terms of the metadata training category specifically in the CAP program, I think the future of this category would be well served if an on-going training project/series were set up and run continually rather than having a number of individual groups do training separately. We found that the individuals were very interested in taking the free training, especially if it were web-based. If an on-going series was available to any individuals interested, the CAP program could fund different trainers to come in and provide the training series, thereby continuing the creativity of having diverse groups contribute to the series, but keeping a continual series available that covers a specific group of topics. The key would be to have a large list of folks to announce training to, have a set calendar with a wide variety of topics (that could change over time), and keep the training series on-going. As new groups were brought in to teach, the list of attendees would grow. If good trainers were able to be funded this way so that new groups would perform outreach, training and follow-up on a set list of topics, it would be very valuable for the metadata community in my opinion. I'd be happy to lend some additional input into the details of such a program if folks were interested (and, I'd be happy to lead such an effort). Comments from folks about receiving additional training are included in Appendix A.
- **Where does the program make a difference?**
 - I believe this program makes a difference by providing funding allowing individuals to be creative in ways that can reach a wide variety of audiences. I liked the freedom we were given to provide training using methods we felt were the most effective for our users. Without this program, we would never have been able to develop the information we put together, and our partners would not have been able to take advantage of the resources provided.
- **Was the assistance you received sufficient or effective?**
 - Yes. Although many folks were asking if we were going to be able to continue the training after the grant was over (and we had to answer a bit vaguely), for the goals we set out to achieve, the assistance was effective and sufficient.
- **What would you recommend doing differently?**
 - I made some recommendations about the metadata training category specifically above. I would also remove the limit recently imposed on folks not being able to submit for another grant in the same category within 3 years, because we could have really built upon the effort we put in this past year. However, that is also a slightly selfish recommendation.

- **Are there factors that are missing or additional needs that should be considered?**
 - I don't think so. I was very happy with my project and enjoyed both the work and the coordination with the CAP team thoroughly.
- **Are there program management concerns that need to be addressed? Time frame?**
 - Not in my opinion.
- **If you were to do this again, what would you do differently?**
 - Overall, I think I would probably do everything similarly except I might not promise quite so much next time. We really sort of took on the world, including 7 sessions, hundreds of participants, training videos, post-training consultation, an article in ArcUser and a presentation at the FedUC. I loved doing it all, so I'd probably end up doing it all again, but it was quite a lot to fit into one grant. I also have some specifics from our sessions that I noted:
 - **Announcement**
 - 6 weeks in advance was good, but bad: I had email overflow after this announcement; I might try to be more strategic if I were to send the announcement out 6 weeks in advance again
 - Send inquiry about 3 months ahead to obtain interest: might be nice to query folks in a very preliminary note to see about topics of interest. By the time we had the feedback, our sessions were fairly well-structured already.
 - **Invites**
 - Try some additional venues for posting (blog, social networking sites)
 - Target states missing from this set of sessions
 - **Logistics**
 - Provide a bigger window around release of a key software product (EME V3.0)
 - Include a how-to in getting set up with web conference
 - Ask about planned fire drills (I suffered a fire-drill in one of the web-meetings, but all turned out OK)
 - **Materials**
 - Obtain samples from additional groups
 - Get even more duck paraphernalia (Sharon's duck materials were loved!)

Appendix A. Post-Training Survey Responses

#	Have you been able to make use of the training that you received?	Have the training and/or tools made any difference in your organization?	Would you be interested in future metadata training efforts?	Additional Comments
1	Yes, the federal government is requiring metadata as part of our final deliverables.	It helped gain a basic understanding of the reasons for metadata and its uses. I still have problems figuring out where certain data needs to be entered in order for it to show up in a specific place.	We now need to train our CAD users on creating metadata.	
2	Yes! We have initiated the creation of metadata in our department for the first time ever. The training for EPA's EME has been very thorough and easy to understand. And the videos provided online have helped with refreshing my memory in certain areas as I was attempting to begin the process and also throughout the implementation stage.	Yes! We now have metadata for many of our datasets.	Yes! I would be very interested in further training; perhaps information on examples of metadata "workflows" with step by step procedures and also examples of metadata standards within other organizations could be included?	Thank you for creating very user-friendly training resources for this great software!! Thank you for all the work that has gone into this project. I have found it very helpful and I have even given a presentation to our local GIS User's group on the EME with directions to your wonderful website and I have had very favorable feedback so far.
3	Yes, I particularly with the parser, which was not all that intuitive before the class	Yes, I am both more diligent in maintaining metadata myself, but also better able to communicate and instruct cooperators on submitting FGDC compliant metadata.	Yes, only so much sink in during one class. For example, I still feel unsure about metadata standards for non-spatial datasets	
4	Yes. The training is very useful for understanding the product.	It makes the metadata creation more efficient and consistent.	Yes. I would like to attend future metadata training.	Thanks a lot for your services.
5	Yes - taking the training spurred me to review our metadata holdings and update a few records. My coworker created several metadata records after participating in the training.	The trainings did generate interest in metadata amongst staff who have not been involved in metadata in the past.	Yes - we would be interested.	I really appreciated the training opportunity. Thanks again!
6	Yes. I have been using the EME.	Yes. I am updating my metadata much more regularly now. It also sparked a discussion amongst my team about how we manage our data.	Yes!	
7	Yes. As the metadata steward in Office of Water, I've been able to utilize certain knowledge and skills I learned from the training when creating new or updating old metadata.	Yes, in a lot of ways it has made the creation of metadata easier and less overwhelming (in comparison to other metadata editors) especially to those who are new to it. I've been able to pass the trainings/tools learned to others in OW.	Yes	
8	Yes, the training allowed me some "hands-on" time with the EME application and also provided me with the necessary terminology to be more effective when training others on how to use the EME tool. It is much easier to use than the FGDC default template and less intimidating to users who do not regularly get into ArcCatalog..	Yes, the tools have made a difference, especially the metadata technical specification guide - we couldn't write good language for GPS data collection metadata without it!	Yes we would	Thanks for putting on the training. The Oracle web conference method was very helpful to many people and we hope you will keep up the good work!

Appendix A. Post-Training Survey Responses

#	Have you been able to make use of the training that you received?	Have the training and/or tools made any difference in your organization?	Would you be interested in future metadata training efforts?	Additional Comments
9	Yes - both in implementing the EME and elevating my general knowledge of what FGDC compliance entails.	Yes - our agency is currently exploring the how to's of an enterprise GIS effort, and implementation of metadata standards and policies play a large role. The EME and related training will be leveraged towards that end.	Absolutely - particularly if it is offered in the same format as before.	I would like to express my appreciation to you, your firm, and EPA for making this training so readily available.
10	Not at this time, but we are hoping to be implementing this in the future and by having the training first, I feel we will be better able to make the implementation. We also have now been able to identify potential ways to streamline our Geospatial Library that we are creating.	Absolutely and we hope to be able to utilize future training of this sort. The training was extremely valuable in that I did not have to travel and lose any day to day work time. By having the training recorded I can have the rest of the staff train at the time that is best for our local team.	Yes, Yes & Yes- the presenters were very well prepared, easy to listen to and handled any technical issues very professionally and in such a way that it did not impact the rest of the group. Additionally, metadata training is something that we desperately need to increase the ability to share data among other agency users.	
11	Yes.	Yes, we have not completely adopted the tools for use but if nothing else this has raised metadata awareness in our organization. This training provided a comfort level for staff unfamiliar with metadata. (It can seem a daunting task at first sight).	Yes.	
12	Yes	Yes	Yes	
13	Yes	No	Possibly	
14	yes	Yes, it has improved my metadata	Sure	
15	I have had several large scale projects that I have been working on, so I have not been able to implement the metadata training into workflow as much as I had hoped to by now. However, it is very valuable for system conception, I am glad that I took the workshop, and I look forward to metadata implementation in the future.	As the GIS is updated, the importance of metadata will be emphasized.	Yes.	Thank you for the additional help you provided. It is appreciated.
16	Not yet	Not yet	Archival summaries of what was presented would be helpful. This training is valuable as a planning tool, for me.	
17	Not to the extent I would like, but somewhat.	Yes. Primarily in elementary type things like turning on/off automatic generation of metadata. How to keep it updated while editing.	Yes, but I feel this training threw me in over my head, but I did learn a lot and have lots of good resources so when the time comes that I need to delve in deeper I know where to look.	It was a nice class.

Appendix A. Post-Training Survey Responses

#	Have you been able to make use of the training that you received?	Have the training and/or tools made any difference in your organization?	Would you be interested in future metadata training efforts?	Additional Comments
18	No, I have not directly used the training as I do not work with data or metadata, however my clients are responsible for data and metadata so I have gained a better understanding of their needs as well as the issues and standards they face when carrying out their day to day business.	Not in my organization, but in my understanding of my clients' organizations	Perhaps.	
19	No.	No.	Perhaps.	The tools used in our organization (Environment Canada) differ from those covered in the training session. It was useful to sit in just for awareness of what others are using.
20	No	No	Yes	Metadata is still a mystery to managers. GOS needs to audit and grade agencies, starting with major products but working down eventually to smaller ones.
21	Yes, Absolutely.	It has increased the efficiency of creating metadata in my role as GIS coordinator. This is noticeable in two areas: Our data is now more likely to have quality metadata, and I am now able to use time that would have been spent developing metadata working in other areas of our GIS program.	Yes, in the future I would be interested in training others in my agency. I would also be interested in receiving training regarding updates to the EME.	
22	minimally	They will when we use them more - I promise	Still always hoping to work more on metadata.	Thank you for the training. You guys are really good at what you do.
23	Yes! We've had a comprehensive metadata effort and are progressing towards making our metadata available online through a catalog format.	A significant difference. Previously we had very little metadata. Now we are on our way to having nearly every record documented and in an FGDC compliant format. The EME tool made the task very easy to accomplish and the final product is complete and standardized.	At this time I don't know that we need any additional training. We are accomplishing our goals. We'd certainly like to hear of any future offerings you have, however.	Your technical support has been great too!
24	Yes (completed metadata for several older files/projects, and some newly acquired data)	Yes, its helped organize and direct the data acquisition process	Yes	
25	Yes	No, I am using our own departmental repository and more in Biological rather than Geospatial	Yes	