Deidre McCarthy is the National Park Service's Chief of the Cultural Resources GIS office in Washington D.C . Her expertise is the application of GIS to historic preservation, particularly those relating to natural disasters. Dorothy Fue Wong conducted this interview on April 25, 2012 (reviewed edited, and updated on August 2016).

Wong: What is your background for your current position?

Deidre McCarthy: My background is completely in historic preservation. I have an undergraduate degree from Mary Washington College [Fredericksburg, Virginia] in Historic Preservation. I also have a graduate degree from the University of Delaware in Urban Affairs and Public Policy with a specialization in historic preservation.

While I was in graduate school I took a look at GIS software. I thought that it would be really helpful for doing a historic preservation project involving historic resources in the State of Delaware that I was working on. So I decided to incorporate GIS into historic preservation. It was not used as a tool by historic preservationists much at that time. We were trying new approaches to historic preservation by using GIS and it turned out very well. I then came here to work for the National Park Service"s Cultural Resources GIS office.

Wong: When did you do your study?
Deidre McCarthy: I was in graduate school from 1994 to 1996. I finished up my thesis, Geographic Information Systems and Their Application in Historic Preservation, in 1996, and then I came here in 1997.

Wong: You were then in a position to work on the Katrina project (2005), which was one of the deadliest disasters in the United States. This involved working during approximately three years in developing the digital Section 106 response for FEMA.

Deidre McCarthy: Right. That was one of the projects that we have worked at the National Park Service. We worked with the Parks, State historic preservation offices, tribal historic preservation offices, and all different kinds of historic preservation programs. One of the projects was to help FEMA, after Katrina, develop a historic preservation response that was able to take advantage of the GIS tools to make it work faster and much better.

Wong: How can the GIS help the Stein Garden cities?

Deidre McCarthy: I think there's a couple of things about GIS that are important to these Stein communities. One is to use GIS as a form of documentation essentially to understand the relationships of all the cultural resources—-how they contribute to the community; how they interact with each other and the environment around them; and how they interact with other communities. I think that it is important for both the Stein Garden cities and those in preservation to understand how a Stein community works within the context of the city or the state within which it is located.

I think also being able to have good information inside a GIS allows a community to work with city planners better. The various participants would be able to exchange data and work quickly to incorporate the cultural resource side of things into the planning for the community. I think that is a huge benefit of the GIS.

I think in terms of our discussion with disaster response and with disaster preparedness, it is important that information about the community be in GIS before the disaster. Recovery from the disaster will come much faster. The GIS data can be incorporated immediately into the disaster response. As a result, pieces of the community don't get destroyed inadvertently and further disrupt the community during the recovery process.

Wong: Where can the Stein communities obtain GIS information?

Deidre McCarthy: For most states there's a state GIS clearing house from which GIS data can be downloaded and incorporated into a GIS. In the case of these Stein communities (which are small and inside local governments), many of the local governments and states will have GIS information that can be acquired and used. So it's worthwhile to work with the city and county planning offices, state historic preservation offices, and state certified local governments.

They have good information so that that process of creating the GIS for an individual Stein community becomes more of a gathering of information that already exists rather than necessarily a creation of new data. In most cases I think a lot of information about these communities already exists in GIS and it's a matter of just gathering that information.

For the most part this is public information, such as for tax parcels or the census. It is very helpful for these communities to understand how to do statistical analysis with the GIS, which is already out there. Examples of analysis would include looking at census data for the communities to see population changes over time, or income change over time, and how that effect the development or

preservation of the community itself. Other examples are providing information about how many contribution resources remain within the community, and how that changes over times and in relationship to changing demographics.

Wong: In a disaster situation, what would you recommend that these communities do with GIS?

Deidre McCarthy: I think the most important thing that these communities can do in any kind of disaster, if their data is in a GIS, is to be able to immediately share their digital information with the response agency (state level or FEMA). The digital information is vital immediately following a disaster—-what is the community about; what is contained within that community and what condition are those resources. It will help the responding agency to better understand what it is responding to.

Wong: Could the manager send the data through email?

Deidre McCarthy: Absolutely. GIS data can be sent through email because these information files would be small because the communities are relatively small.

Wong: Would you recommend that these communities also send the GIS data to their congressional representative?

Deidre McCarthy: I think that might be a good idea, particularly if the representatives are seeking federal grant money for the community's recovery. I think in our experience when we have dealt with congressional offices, what's most important to them is a paper map with tables or graphs or statistics relating to the damaged site.

In most cases, especially immediately following a disaster, congressional offices have many things going on at the same time and they don't have a lot of time to do their own analysis. So it is important to have the complete data analysis for them. In some cases, the results could be presented as a table or as a graph, or as a paper map. We find that to be the most effective way to work with the congressional delegation.

Wong: As Historic National Landmarks, these Stein communities have first priority or special funding in a presidential-declared disaster. Could they would send the data to FEMA?

Deidre McCarthy: If it is a presidentially declared disaster, then FEMA would be the responding agency, and they would come and set up their response office and would probably come to the community to ask for information. If they didn't come to the community, they would by law have to go to the state historic preservation office to get more historic and cultural information and what any challenge they would need to take into account.

FEMA would probably go through the state office to contact an individual community. If the individual community had GIS information ready to provide for FEMA, they would be one step up on the rest of the response process. It would be much easier for FEMA to work with them because they had that information and would be able to incorporate it into their various different processes as they move forward in their recovery.

Wong: How would GIS help the Stein communities increase their knowledge of each other?

Deidre McCarthy: All the Stein communities are in different states and across the country. They may be interested in exchanging GIS data so that they could see how the other communities were laid out and how they interacted with other resources so that they could understand the historic context within which their own community was designed and built.

I think setting a network among those Stein communities would be most helpful for helping them to understand where to obtain information, whom do they talk to, what tools are they using, and what kinds of analysis are they performing. Thus, comparisons could be made across the communities, not necessarily sharing data, but sharing ideas about how to get information and how to perform analysis with that information. I think those kinds of approaches would be most effectively shared in that kind of network.

Wong: Please discuss how GIS could help in the management and preservation of the Stein communities.

Deidre McCarthy: The GIS is a great management tool because its designed to be an analysis tool. So it would certainly help these communities to plan better in terms of what are they going to change and what are they going to do. For instance, is there going to be a community-wide effort to bring back a particular tree or bring back a particular aspect of their landscape? The GIS is going to be able to help them understand how that would work. All kinds of other natural resource information can be overlaid. All kinds of other planning information can be overlaid in terms of city planning. For instance, what are they planning on

doing? Are they planning to change roads, to expand roads, to put in a new school, or put in a new playground? How would that affect this community? The GIS is a wonderful tool to help understand and plan and even model how those things would take place on their landscape and how they would interact with other landscapes around them.

Wong: National Historic Landmarks are required by law to maintain the site's high historic integrity. Would GIS be important to see that the site's integrity is maintained intact?

Deidre McCarthy: Yes it would. GIS is certainly detailed enough to be able to keep track of what is happening with an individual resource so that you could understand what are the main components of a particular building and what makes it significant. Also, GIS can answer the following questions: What are the components of this building that make it significant within the context of the community? What is its integrity now and over time? How does it change so that you could essentially get a snapshot of each one of the contributing elements of the landscape that need to be preserved? What should receive the highest priority in terms of making sure this stays the same?

Wong: GIS can then serve as a chronological record.

Deidre McCarthy: Sure. There's a lot of tools with the GIS that allow mapping of things that are related to or limited by time, such as showing the changes in a landscape over the span of time. Thus, GIS can keep track of what is happening to a particular resource. GIS is really databases attached to maps. I can input information into these databases. I can re-survey a particular resource every year, every five years, or every ten years. Then I can see that change over time and understand how the various elements may change. Then I can ask what I might do to preserve any particular element that has high priority.

Wong: Lets take the situation at Baldwin Hills Village where a few of the buildings are sinking. How would GIS help?

Deidre McCarthy: We could do an overlay of different kinds of information like topographic information, soil information, information about local utilities and things like that and try to get a better understanding of why those buildings are sinking. Is it because of the soil? Is it because of the water mains that are going underneath of it? Is it because of other utilities that are having an effect? Is it because of erosion? What is the cause? GIS could start performing analysis there

and help you maybe look at predicting what will happen to this in the future. What is s the timeline on how this is going to sink? Is it going to stop if we change this element? Is it going to change into a new direction essentially if we put a berm (raised bank or path) here or if we get rid of this utility here?

Wong Please tell us how GIS interfaces with HABS/HAER/HALS.

Deidre McCarthy: Here at the Park Service we have many different cultural resource databases of information that track historic buildings, historic landscapes, archeological sites and other kinds of things. One of those databases is kept by HABS/HAER/HALS. They keep track of all the cultural resources that they have documented. We are at this point using GIS to help us understand where all these resources are that they have documented.

We then link this GIS information to the HABS/HAER/HALS databases. Also, I could use the GIS as an interface to click on a single location and see if it is listed on the National Register and has been documented by HABS/HAER/HALS. If it has been documented, what is the documentation? Thus, you could get a better sense of what has been documented, to what degree, and what priorities might be needed to recreate these resources within a community.

So we're gradually getting all of the HABS/HAER/HALS locations that have been documented into GIS because the programs are so old having been started in the '30s. They don't all have locations. Many of the resources have been destroyed. So we're sort of going through a process now with trying to get good locational information for all those resources. But we'll eventually have it so that we can incorporate all those locations into the GIS to study the following in HABS/HAER/HALS—- what is the distribution of resources; where things are that have been documented; and to what degree have they been documented. Finally, the Library of Congress stores these documentation and provides access to the public through its website.

Wong: Thank you for such a comprehensive explanation. In these communities there are people who are very comfortable in working with technology in historic preservation. Where can they go to get more information or training about GIS? You mentioned at one time that perhaps a few individuals can be designated as the experts in these communities.

Deidre McCarthy: GIS as a subject matter has become very popular within the last few years and it has sort of exploded in how it's being used. There's one company that seems to dominate the GIS software world and that company is ESRI (Environmental Systems Research Institute). They have a very good website which

offers a great deal of training, most of it free. Some of it is web based and some of it classroom based. Anyone can take any of that training and apply it. It provides a great foundation for what is GIS and how it can be used. ESRI is located in Redlands, California.

Wong: You recommend also Google for beginners.

Deidre McCarthy: There's lots of free tools that are a little bit more intuitive to use than a full-blown GIS piece of software. Things like Google Earth, Bing Maps, or ESRI even has a free GIS piece of software that you can download from their website called Arc GIS Explorer. And they are a first step on the way to getting into the GIS world. It would be something that the community members could use to understand their own community better.

But I think, as you mentioned, having one or two people within the community that have a little bit more GIS knowledge would help to do the kinds of analysis that we're talking about and the kinds of modeling that might look at how a community might change if there was a disaster or if there was an environmental situation. Having someone onsite would be particularly helpful. They could create and provide the information from those free tools that the rest of the community could take advantage of. There is a middle ground so not everyone has to be a GIS expert in order to get access to this information.

Wong: Are there any final remarks that you want to make concerning GIS?

Deidre McCarthy: I think GIS is a great tool to use at all levels of government agencies and communities. I think it's a great community tool to help you understand the community and how it interacts. I think it's a great cultural resource management tool. I think it's a great communication tool. I think it's a great way to get your message across to many audiences. Everyone responds well to an image. I think the GIS can provide that. So I think it's a great tool to have and to use in these cases.