Effective Community Engagement Tools in Watershed Plans: Examples from the USA

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1. Introduction

The purpose of this paper is to explore, understand, and document various community engagement (CE) tools or instruments that have been used in the watershed planning process within the United States (USA). By "watershed plans", we mean two types of plans: (i) watershed management, protection, or restoration plans, and (ii) flood management or stormwater management plans at the watershed level. This paper aims to find out a few exploratory questions. Does the nature of CE tools vary for watersheds of various scales or geographic regions? What are the most commonly used CE tools across the USA and why or how are they used in watershed plans? Have digital civic engagement tools, in recent times, become as popular as in-person engagement practices? What are the primary concerns or constraints of using CE tools effectively in developing USA-based watershed plans? What CE tools have been proved effective in the watershed planning process?

In order to answer the questions, we use qualitative methods such as document reviews and case study research. In the next section, we provide a literature review highlighting evaluations of the use of CE tools in the watershed planning process. In the following section, we develop a typology of various CE tools used in watershed plans of various scales. This typology is based on our review of 23 watershed plans, including watershed management, protection, or restoration plans and green infrastructure plans, selected from various regions of the USA. We document the use of in-person CE practices such as public information meetings, stakeholders outreach meetings, focus groups, and workshops, and digital CE practices such as emails, web sites, and social media. In the following section, we present seven brief case studies, selected from those initial 23 plans, discussing in detail the nature and types of CE techniques used in the watershed planning process. Finally, we discuss the major constraints of using CE tools and provide an outline of lessons learned from the USA that may be applicable to watershed planning in other counties.

2. Literature Review

The late American author and planner Sherry Arnstein (1969) developed a "ladder of public participation" that posits nine steps of participation ranging from "manipulation" at the bottom of the ladder to "delegated control" and "citizen control" at the top. Modern planners are familiar with these CE steps and realize that securing the support of important stakeholders can be the critical step in making a plan a reality (ISOCARP 2013).

Effective CE tools promote participatory decision making, an age-old process where people deliberate together over issues affecting their future and make appropriate decisions (Toker 2012). So, what does it mean in the world of planning? Throughout the decision making process, the planners work with stakeholders, help them reach decisions about planning issues, and translate the process and decisions into planning language (Toker 2012). The

CE process promotes two types of actions: making *for* people and making *with* people. Communities throughout the USA use participatory decision making tools in their planning and development processes in order to fulfill two primary objectives: understanding people's needs and practicing good design and management (Toker 2012).

The process of creating watershed plans can be highly technical. As such, public outreach and education programs are typical to most watershed planning processes. The more advanced forms of CE where citizens participate as decision makers are not as common because some professionals perceive this level of citizen input may undermine the value of the "experts." To address such concerns, watershed planners have developed methods and tools that not only address such concerns but also make this highly technical process inherently democratic.

Evaluation of effectiveness of participation and participation exercises

While much work has been done on evaluating partnerships and public engagement campaigns overall, very little research exists on the effectiveness of CE tools used within the context of watershed planning and management. Carr et al. (2012) conducted a meta-analysis of published research on any form of participation, from passively receiving information to actively engaging in decision-making in water resources management and planning, resulting in a categorization of three types of evaluation and corresponding criteria. The types of evaluations included quality of the participation process, intermediary outcomes, and resource management outcomes. The key findings indicate that only a few studies show watershed management benefits from participation, but no studies reveal negative impacts of participation. An earlier study by Mandarano (2008) reported the results of comprehensive evaluation of a National Estuary Program, a watershed management process, using all three tiers of evaluation noted by Carr et al. (2012). In this study participation was defined by the routine participation by individuals in the formal collaborative planning process. The findings indicate that the collaborative process produced learning, social capital, political capital, institutional changes and on-the-ground outcomes.

More conventional, ubiquitous and formal means of public engagement tools such as public hearings and public comment periods tend to emphasize the existing opposing sides while reinforcing existing power inequalities (Innes & Booher 2004). Kingsley (2008) found in a study of several public information meetings geared towards water management that, while public meetings served as a good source of information about watershed issues, they were not effective at increasing public participation for watershed planning. On the other hand, disseminating public information by utilizing technology-based learning (such as GIS) participants expressed a better presentation experience and enhanced understanding of the relationship between watershed management policies and water quality (Conroy & Gordon 2004).

Conroy (2011) evaluated the specific elements of the participation process in a water-quality planning process that encourage or discourage effective participation. The meeting and participation format (e.g. participating in an advisory board, a mail or telephone survey, an email solicitation, among others) had a significant influence on whether an individual was likely to participate (Conroy 2011). The effect many other elements of the participation process had on participants, including whether the topic was personally significant and whether meeting times were convenient, were also discussed.

Moorehouse & Elliff (2002) concluded from a study of a Texas water resource planning process that focus groups can "help facilitate communication and lessen frustration." Konisky & Beierle (2001) have qualitatively described and discussed the strengths and weakness of what were at the time "innovative" CE mechanisms—such as study circles, citizen juries, and collaborative watershed management—but called for more evaluation of these processes.

Some of these processes are aimed specifically at those who typically do not or would not participate in the more conventional or formal exercises.

Systematic study of the effectiveness of particular tools or mechanisms used for CE has been difficult due to a number of factors, as enumerated by Rowe & Frewer (2004; 2005). Various and overlapping definitions of tools and mechanisms exist, as there is no central authority or universally-agreed-upon definitions for these tools. While the usage of focus groups or interviews is widespread, many forms of workshops and other group-based interactions are often customized to the users.

Constraints to using CE tools effectively in watershed planning

Constraints to effective public participation throughout the process of watershed planning come in many forms. An incoherent leadership structure or failed problem identification can be serious constraints (Floress et al. 2009). The threat of the public seeing issues as being "studied to death" can also be a barrier to effective participation (Larson & Lach 2008), or that the process is seen as being more important to the project sponsors than "getting results" or "doing something." Larson & Lach (2008) also found that different kinds of participants in a planning process (i.e. whether they are members of place-based or non-place-based organizations) affects the environmental attitudes of the participants, their expectations of the participation process, and how likely they will be satisfied with the results.

3. Review of CE Methods in Watershed Plans

We have reviewed 35 watershed plans, selected randomly through a Google search. After initial reviews, 23 plans that incorporated and described CE methods – either briefly or elaborately – were selected for further analysis. These plans were prepared by government agencies or nonprofit organizations from various regions across the USA, between 1999 and 2012. The CE methods or tools used in these plans were grouped into several categories, described below. Table 1 provides a matrix of PP methods used.

In-person CE practices:

- Public Meetings (public information meetings, citizen meetings, and stakeholder meetings)
- Group Interactions (advisory committees, citizen advisory committees, core work groups, technical work groups/ steering committees, focus groups, and youth outreach)
- Surveys and/or Questionnaires
- Events (workshops, charrettes, open houses, tours, speakers bureau, and major public events)
- Print (press/news releases, newsletter articles, brochures/handouts, and direct mailing)

Digital CE practices:

- Email
- Websites and Social Media
- Open Access Documents (public access to draft plans and document repositories)

Table 1: CE Methods used in watershed plans across the USA

			In-person CE practices					Digital CE practices		
Year	**Title**	**Study Area (sq mi)**	**Public Meetings**	**Group Interactions**	**Survey/ Questionnaire**	**Events**	**Print Media**	**Email**	**Websites & Social Media**	**Open Access Documents**
1999	Petaluma Watershed Enhancement Plan	146	X	X		X				
2000	Gwinnett County Watershed Protection Plan	437	X	X					X	
2002	Public Participation Plan for Carlsbad Watershed Management Plan	210	X	X	X	X				
2005	WRIA 1 Watershed Management Project	1280	X	X	X		X		X	
2006	St. Clair County Northeastern Watersheds Management Plan	219	X	X	X	X	X		X	
2006	Southern Washington County Watershed Protection Plan	56	X	X	X		X			
2004; 2008	Flint River Watershed Management Plan	568	X							
2008	Plum Creek Watershed Protection Plan	397	X	X	X	X	X	X		
2008	Pebble Creek Watershed Protection Plan	18		X						
2009	Metro North Georgia Watershed Management Plan	4941		X						
2010	Anacostia River Watershed Restoration Plan and Report	176	X	X	X	X			X	
2010	Duck Creek Watershed Management Plan	63	X	X	X	X	X	X		
2010	Mill Creek Watershed Management Plan	25	X	X						
2011	Blackberry Creek Watershed Action Plan	75		X						
2011	Middle Huron River Subwatershed Management Plan	217	X	X		X	X	X	X	X
2011	Norwalk River Watershed Action Plan	64	X	X						
2011	Prairie Dog Creek Watershed Plan	360	X	X			X			

			In-person CE practices					Digital CE practices		
Year	**Title**	**Study Area (sq mi)**	**Public Meetings**	**Group Interactions**	**Survey/ Questionnaire**	**Events**	**Print Media**	**Email**	**Websites & Social Media**	**Open Access Documents**
2011	San Marcos Master Water Quality & Hydromodification Plan	20								
2012	Antelope Creek Watershed Basin Management Plan	8	X	X		X	X		X	
2012	Barrington-Palmer-Warren Rivers Watershed Plan	68	X		X			X	X	X
2012	San Francisco and Blue Rivers Watershed Improvement Plan	2700	X	X						
2012	Santa Rosa Creek Watershed Management Plan	48	X	X	X	X				
2012	Lower Sonoma Creek Flood Management and Ecosystem Enhancement	166	X							

Based on initial reviews, we have found that the vast majority of plans (80%) reported incorporating the more conventional practices of in-person strategies, including public meetings and group or committee interactions to foster community engagement. Less than half (40%) included a description of any public events other than meetings. These public events could include more interactive processes that might attract a larger subset of the target population, such as workshops, design charrettes, and watershed tours and festivals. Far fewer plans included mention of any digital civic engagement practices: 32% of plans mentioned having a website or social media presence as an outreach tool, while only 20% of plans explicitly mentioned using email. No plans surveyed explicitly mentioned using social media as a part of the planning process, although one (Antelope Creek WBMP) indicated use of a social media strategy for one of their recommendations, focusing on homeowner outreach and education.

4. Brief Case Studies

The seven case studies presented herein highlight the CE tools used to support watershed management planning. In each case study CE tools were used for a range of public education and outreach to decision making practices to inform the formal decision-making body, which are a range of collaborative partnerships and coalitions responsible for developing and implementing the resulting watershed management plan.

Anacostia River Watershed Restoration Plan[1], 2010, Washington DC metro, size 176 sq miles

This watershed restoration plan was prepared by the Anacostia Watershed Restoration Partnership (AWRP), but the CE process was primarily handled by a citizen advisory committee—the Anacostia Watershed Citizens Advisory Committee (AWCAC). The AWCAC was formed and used by the project team to solicit comment and feedback during the plan's development. Additional discussions and meetings with the committee members and representatives of other community and watershed groups were held.

A public meeting open to all citizens was held during the beginning of the planning process to outline the study objectives, the proposed methods to be used and the products to be completed for the plan. Several interim "working" meetings were held primarily with the constituent watershed groups of the study area to brief group members on study progress and solicit feedback on the prioritization and support for proposed or provisional restoration projects in their respective subwatersheds.

Interim reports and fact sheets on the progress and status of the study were posted on the web site *anacostia.net*, with a 45-day open public comment period following the release of interim reports. Final draft reports were posted on the internet for a 60-day public review and comment period, specifically to solicit feedback from community watershed organizations and other interested parties.

Antelope Creek Watershed Basin Management Plan[2], 2012, City of Lincoln, NE, size 8 sq miles

The City of Lincoln and Lower Platte South Natural Resources District (NRD) worked with a project team of scientists and engineers to establish this watershed basin management plan and oversee the CE process. The CE process included both group interactions and public events. There were two main group interactions: the Core Work Group – professional and technical staff from various agencies, who met 11 times; and an Advisory Council – 12 member council comprised of resident, business and institutional stakeholders, whose members were proposed by the Core Work Group and appointed by Mayor. The council met three times. Two open house events were also held for the public at large: one at the beginning (in which approximately 90 people attended) and one toward the end of the process (in which approximately 40 people attended). In advance of the open houses, 11,000 postcard invitations were sent to property owners, and representatives of special interest groups and resource agencies. The first Open House used a large map of the Basin area, on which stakeholders and other participants could point to their houses and to the associated problem areas. The second Open House featured different stations at which people could stop and learn about the recommendations. More thorough stakeholder meetings were held with six stakeholder groups, which were identified by the Advisory Committee.

Four editions of newsletters were composed and mailed to 1,100 individual stakeholders, including individuals, businesses, non-profit agencies, community organizations and government agencies. The first two newsletters outlined the general watershed management process and the typical stormwater and pollution issues facing a watershed, while the last two presented the watershed modeling and testing conclusions, as well as the stormwater best management practices (BMP) recommendations for the plan. Press releases and news articles were utilized to publicize the open house events, while also keeping the public abreast on plan activities. The City of Lincoln Watershed Department website was also used to keep the public abreast on the details of the planning process. Information on the website included a project description, frequently asked questions, Core Work Group and Advisory Council descriptions and membership, as well as descriptions of the CE processes. The site was regularly updated and included an interactive glossary and several images.

Barrington-Palmer-Warren Rivers Watershed Plan[3], 2012, East RI/West MA, size 68 sq miles

The FB Environmental Associates of Portland, ME, was the US Environmental Protection Agency (USEPA) contractor responsible for working with Rhode Island Department of Environmental Management (RIDEM) in the development of this watershed plan and oversee the CE process. The plan encompassed a broad array of stakeholders from Rhode Island and Massachusetts, including municipalities, non-profit and conservation organizations, Massachusetts Department of Environmental Protection (MADEP), and local citizens.

To introduce the planning process to stakeholders, two kick-off meetings were held attracting 27 and 17 attendees, respectively. Stakeholders included municipal elected officials, town/regional planners, watershed association members, natural resource professionals, representatives from non-profit organizations, and landowners in the watershed. Flyers were used to publicize the meetings, and follow-up phone calls were made to invited stakeholders in advance of the meetings. All meeting documents and maps were posted on the project website.

In addition, municipal meetings were held in individual watershed towns. Attendees were identified during the kick-off meetings and included municipal employees and other stakeholders. Similarly, follow-up email and phone calls were used to confirm attendees. In total five municipal meetings were held. Draft summaries of meetings were sent to municipal officials for review and comment before submitting the final draft to the RIDEM and USEPA.

A draft watershed plan was posted on website for approximately 2 months for public review and comment before being finalized. A public meeting was also held to solicit public comment on the draft report.

Duck Creek Watershed Management Plan[4], 2010, Southeast Iowa, Size 63 sq miles

This watershed management plan was created by Scott County Soil and Water Conservation District (SCSWCD), in collaboration with Duck Creek Watershed Management Plan Advisory Council, Iowa Department of Natural Resources, and other partners from local government agencies. A local nonprofit, River Action, Inc. facilitated a planning committee, which met monthly for one year. The committee consisted of representatives of federal, state, county and municipal agencies, corporate stakeholders, local professionals, environmental organizations and concerned landowners and citizens, and created an initial watershed plan in 2008-2009. This second plan, sponsored by the Scott County Soil and Water Conservation District (SCSWCD), continues the work of the initial plan.

As part of the CE process, the SCSWCD and Partners of Scott County Watersheds, among other local partners, conducted a series of public meetings, with approximately 40 people on average attending each, including the local media, which resulted in press coverage. The plan's description of this process noted that more meetings should be held because they are "an effective means of providing information, receiving input, and attracting press." A direct mailing was sent to land owners and key agricultural operators. This mailing included a request to respond if interested in receiving additional cost-share programs and incentives on manure management planning. There was little to no response. A meeting in which the SCSWCD specifically reached out to livestock producers was organized, with mailed postcard invitations with follow-up phone calls – 25 attended, 14 of which were livestock producers. Surveys were distributed at beginning of meeting, and 7 were returned.

Surveys and questionnaires were sent to the youth in the watershed area specifically soliciting their views. An online Survey was emailed to 400 young people, with 83 individuals completing the survey. The youth survey also was distributed during an environmental fair, and 194 surveys were completed.

The SCSWCD found that there was little enthusiasm for serving on the SCSWCD committee to determine future projects in Duck Creek Watershed. The agency concluded that more enticing, exciting, interactive tactics will be researched and used to engage the public in the planning process.

Plum Creek Watershed Protection Plan[5], 2008, TX, Size 397 sq miles

The Plum Creek Watershed Partnership and the Watershed Coordination Steering Committee (WCSC) of the Texas State Soil and Water Conservation Board chose Plum Creek to develop a watershed protection plan as a voluntary alternative to more regulatory approaches water quality management. Several initial public meetings were held to advertise and inform the public about the watershed planning process, and participants were openly invited to join the resulting Plum Creek Watershed Partnership, which would be the main vehicle for the planning and CE process. From this partnership, a steering committee, work groups, and a technical advisory group were formed, composed of extension and conservation district representatives, local and regional governments, and citizens and volunteers.

This process had many informational and more passive venues for outreach. A plan website included information on the watershed and partnership, a regional watershed coordination newsletter, press releases, an online discussion forum, links to project partners, access to the Watershed Protection Plan, water quality data, a meeting schedule, and information presented at previous meetings. Fact sheets were distributed in the watershed via direct and electronic mail, at stakeholder meetings, and at other area events, and were made available at various public offices and community organizations; updated versions are made available on the project website. Ten news releases were sent out to over 100 media outlets. Newsletter articles were written and distributed bi-monthly and via email to watershed groups and several other additional outlets such as community organizations, extension officers, master gardeners, master naturalists, and homeowners groups. These articles were also posted on the website.

The partnership steering committee sponsored events such as a watershed tour, which was a full-day event with 64 participants. Its goal was to provide an overview of the current conditions and challenges the watershed faced. An outreach and education work group of the Plum Creek Watershed Partnership, in order to create a logo and branding identity for the watershed planning effort, surveyed stakeholders to solicit ideas. When used with project-related document and marketing materials the logo and associated branding were intended to stimulate more public awareness and program recognition.

WRIA 1 Watershed Management Project[6]*, Long-Range Plan for Public Involvement and Education, 2001, Bellingham, WA, Area: 1,280 sq miles*

A collaborative partnership among federal, state, and local agencies was in charge of the overall decision-making process of this watershed management plan. In addition, the Planning Unit of a regional coalition of county, city, state and tribal governments created a separate CE plan. This CE plan includes a series of proposals intended to integrate public involvement and education into the ensuing watershed planning process. The plan included the participatory elements for both the planning and the implementation phases of the watershed management plan, with the intent to both inform and solicit involvement and input. When soliciting input the three general strategies were to solicit direct input, stay attuned through “temperature taking” by monitoring the understanding and feelings of citizens in general, and to close the loop by having citizens see how their input was being incorporated into the planning and implementation process.

Several CE tools were used to inform citizens of the issues and of the planning process in general. They included broadcast and print media activities (television, a newsletter insert in local newspapers and radio), a project website, bi-weekly/monthly updates via website, email, fax, and articles in existing newsletters. Project information and updates were included in other governmental outreach efforts as well. In the rural parts of the watershed that did not have established community organizations, informal community leaders are being recruited to help educate the local public during the ongoing planning process. This effort will also

include maintaining a presence at local festivals and events, with tables, information distribution, and displays.

Venues to gather and solicit feedback and comments included quarterly public meetings that included Q & A surveys that followed meetings, a speaker's bureau to attend meetings of community groups and organizations and solicit input, and disseminating information and questionnaires at coffee shops, laundromats and other informal gathering places. A technical team was created to translate scientific and technical information and surveys to an average lay person. An evaluation of the CE process and individual methods will be undertaken by the Planning Unit staff.

Middle Huron Watershed Management Plan – Public Participation Document[7]*, 2011, Ann Arbor-Ypsilanti Metropolitan Area, MI, Area: 217 sq miles*

The Huron River Watershed Council (HRWC) was responsible for the overall collaborative watershed planning process. A separate public participation plan (PPP) was developed for the Middle Huron Watershed Management Plan. This PPP was submitted by the HRWC, and it included two main categories of participation: Public Notices and Outreach and a Citizen Advisory Committee or CAC. The CAC was made up of local stakeholders that met on a regular basis to provide feedback on the plan as it was being developed. The HRWC, in conjunction with the Middle Huron River Stormwater Advisory Group (SAD) implemented the PPP. Public meetings were held at various stages of the process as well, one of which was in collaboration with the CAC.

Media and press releases and articles in local newsletters were used to alert the public about plan progress and solicit feedback from citizens on the plan development. Announcements to local boards and other interested groups were also made, including email listservs for two adjoining watershed councils. Announcements, flyer distribution were handed out and on display at major public events in watershed communities soliciting citizens' involvement in the planning process and initiative. The project website shared information on the status of the plan's development, as well as the planning process in general—the websites hits were tracked as well.

Throughout the CE process, the HRWC evaluated the various tools. An evaluation survey form was handed out to all participants after each meeting or event, with special attention given to finding out how each participant found out about the meeting or event.

5. Lessons Learned from the USA Experience

Our paper set out to explore how CE tools are being used in the watershed planning process in the USA. We sought to understand the effective use of CE tools from several perspectives. First, our aim was to reveal which CE tools have been proven effective in the watershed planning process. The planning documents reviewed indicate that agencies and nonprofit organizations employ a large number of in-person and digital CE tools. While Sherry Arnstein (1969) would describe many of these tools as "tokenism" in her ladder of participation as most only involve consultation and information exchange, they seem to be legitimate attempts by organizations to inform and engage the public, particularly the important stakeholders in the watersheds. Unfortunately, the descriptions of civic engagement processes in the watershed plans and related documents do not include information relative to assessing the effectiveness of such efforts.

With respect to the variability of CE tools employed and most common tools used, the paper indicates processes across the US are making use of a broad array of CE tools. The most commonly used tools are traditional CE practices such as public meetings, group

interactions, events, and surveys. Digital CE technologies are increasing in usage. There does not appear to be a relationship between the size or geography of the watershed or complexity of the issues and the types of CE tools used. This lack of variability is likely due to the organizers' familiarity with traditional forms of CE and reliance on using the practices already in their tool box.

The most interesting findings are related to the primary concerns and constraints of using CE tools in watershed planning processes. While the efforts appears to target improving the public's education and awareness of the planning process, a handful also appear to include serious attempts to create partnerships and provide some degree of delegated power to plan stakeholders. This limitation is likely linked to the inherent constraints associated with watershed management and planning. Watersheds almost always transcend political jurisdictions and involve fragmentation of authority and involve complex scientific concerns, thus seeking citizen control or delegating decision-making powers to the general public is simply not feasible.

Our paper also describes the complexities associated with conducting CE. Some organizations directly conduct CE processes, while others use existing councils and citizens' advisory committees or create new ones to support the development of a watershed plan. In our analysis of watershed planning we found that it was often difficult to discern the degrees of autonomy and authority provided these councils and committees, and whether or not these functions were important to the success of the formal decision-making process or implementation.

The case studies do not provide clear answer to the question about which CE tools have proved most successful. As noted early, the documents reviewed provided descriptive information of the CE process but not assessments of their impacts. What is needed to answer the question regarding the effectiveness of CE tools and their correlation to successful decision making and implementation is rigorous third party assessments. For example, in his analysis of the planning and management activities of Delaware River Basin Commission (DRBC), a four-state, federal-interstate compact agency, Featherstone (1999) sought to link actions taken by the agency to achieving stated goals and positive outcomes through a program evaluation methodology. Through use of multiple analytical techniques including statistics and surveys, Featherstone was able to document positive outcomes achieved by the DRBC. This level of research was beyond the scope of this paper.

End Notes

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