

11-2021

## Engaging Residents in Policy and Planning for Sea Level Rise: Application of the Action-Oriented Stakeholder Engagement for a Resilient Tomorrow (ASERT) Framework

Juita-Elena (Wie) Yusuf  
*Old Dominion University*, [jyusuf@odu.edu](mailto:jyusuf@odu.edu)

J. Gail Nicula  
*Old Dominion University*, [jnicula@odu.edu](mailto:jnicula@odu.edu)

Daniel P. Richards  
*Old Dominion University*, [dprichar@odu.edu](mailto:dprichar@odu.edu)

Ogechukwu Agim  
*Old Dominion University*, [oagim001@odu.edu](mailto:oagim001@odu.edu)

Michelle Covi  
*Old Dominion University*, [mcovi@odu.edu](mailto:mcovi@odu.edu)

See the [full text of this work at the digitalcommons.odu.edu/publicservice\\_pubs](https://digitalcommons.odu.edu/publicservice_pubs) page for additional authors.



Part of the [Climate Commons](#), [Communication Commons](#), [Environmental Policy Commons](#), and the [Public Policy Commons](#)

---

### Original Publication Citation

Yusuf, J. E. W., Nicula, J. G., Richards, D. P., Agim, O., Covi, M., & Anuar, K. A. (2021). Engaging residents in policy and planning for sea-level rise: Application of the Action-oriented Stakeholder Engagement for a Resilient Tomorrow (ASERT) framework. In J.E.W. Yusuf & B. St. John III (Eds.), *Communicating Climate Change* (pp. 36-57). Routledge.

This Book Chapter is brought to you for free and open access by the School of Public Service at ODU Digital Commons. It has been accepted for inclusion in School of Public Service Faculty Publications by an authorized administrator of ODU Digital Commons. For more information, please contact [digitalcommons@odu.edu](mailto:digitalcommons@odu.edu).

---

**Authors**

Juita-Elena (Wie) Yusuf, J. Gail Nicula, Daniel P. Richards, Ogechukwu Agim, Michelle Covi, and Khairul A. Anuar

## **Engaging Residents in Policy and Planning for Sea Level Rise: Application of the Action-Oriented Stakeholder Engagement for a Resilient Tomorrow (ASERT) Framework**

Juita-Elena (Wie) Yusuf  
Old Dominion University  
USA  
ORCID <https://orcid.org/0000-0003-3599-1417>

J. Gail Nicula  
Old Dominion University  
USA  
ORCID <https://orcid.org/0000-0002-3672-0275>

Daniel P. Richards  
Old Dominion University  
USA  
ORCID: <https://orcid.org/0000-0003-2155-3416>

Ogechukwu Agim  
Old Dominion University  
USA  
ORCID <https://orcid.org/0000-0002-6731-9302>

Michelle Covi  
Old Dominion University  
USA

Khairul A. Anuar  
Old Dominion University  
USA

(Authors' submitted version for inclusion in the book *Communicating Climate Change: Making Environmental Messaging Accessible*, edited by Juita-Elena (Wie) Yusuf and Burton St. John III)

**Abstract**

This chapter describes the application of the Action-oriented Stakeholder Engagement for a Resilient Tomorrow (ASERT) framework for communicating with and engaging both residents and community stakeholders in their localities' efforts to prepare for and to respond to flooding and sea level rise. The application of ASERT incorporates communication, education/learning, and gamification elements that can be embedded into community meetings. We describe the way in which ASERT community meetings are designed (1) to provide an inclusive and engaging process that will allow residents to participate in their city's resilience efforts; (2) to provide information about resilience in an environment that encourages social learning, including curiosity and reflection, to promote behavioral change that will result in improved resilience and public support for resilience solutions; and (3) to allow residents to offer real-time perceptions of risk to, and feedback about, resilience solutions in their communities and/or cities. This chapter briefly discusses the ASERT framework, illustrates its application (using two examples from Virginia Beach, Virginia), describes the use of gamification in the community meetings, and provides lessons learned regarding communication and stakeholder engagement efforts targeted at building resilience in coastal communities.

## **Introduction**

The Action-oriented Stakeholder Engagement for a Resilient Tomorrow (ASERT) framework was developed to improve the communication among, and engagement of, residents and community stakeholders regarding their localities' efforts to prepare for and be able to respond to flooding and sea level rise (SLR). The application of ASERT incorporates communication, education and learning, and gamification elements that are embedded into community meetings.

The ASERT framework was used to underpin a community engagement effort as part of the City of Virginia Beach, Virginia SLR planning process. We describe how ASERT community meetings were designed to: (1) provide an inclusive and engaging process that will allow residents to participate in their city's resilience efforts; (2) provide information about resilience in an environment that encourages social learning to promote attitudinal and behavioral change that will result in improved resilience and in public support for resilience solutions; and (3) allow residents to give real-time perceptions of risk and feedback about resilience solutions in their communities and city. The community meetings were structured around action-oriented stations where participants could take part in activities that provided information about flood risks and vulnerabilities, learn about SLR and flood resilience solutions, and share their perceptions of, and preferences for, different resilience solutions. More importantly, the stations provided residents with the opportunity to interact directly with city staff and technical experts about SLR and flooding. Participants received game cards and stamps for taking part in the different stations, and earned prizes for collecting stamps on their game cards.

This chapter provides an overview of the ASERT framework, describes the participatory and gamification approaches that are embedded within the framework, and illustrates the application of ASERT using two examples in Virginia Beach. We include lessons learned for communicating about issues such as climate change and for engaging community stakeholders in resilience and other planning efforts.

## **Overview of ASERT**

A team of researchers from Old Dominion University and Virginia Sea Grant developed the ASERT framework and field-tested it in 2016 in the Hampton Roads region of coastal Southeastern Virginia, in the U.S.A. (Yusuf et al., 2019). The framework was designed to help policymakers, planners, community leaders, and other stakeholders ensure broad stakeholder engagement that would reach beyond basic public participation, with an emphasis on using a participatory approach to generate action-oriented dialogue about resilience. While resilience is both an outcome and a process, our approach emphasizes the latter, focusing on community members' learning and taking responsibility for making decisions that will improve adaptive capacity.

The ASERT framework is based on four key principles: (1) an inclusive process, (2) an emphasis on gaining local knowledge, insights, and contexts, (3) integrated engagement, and (4) a direct focus on the incorporation of mechanisms to affect change. These four principles combine to provide both policymakers and stakeholders with a deliberative approach to better direct not only planning efforts, but also the use of local resources to build and improve social-ecological resilience (Yusuf et. al., 2019). The ASERT framework has been designed to focus on the

process aspect of resilience by emphasizing learning, surfacing the local context, and creating knowledge to support effective decision making in ways that improve adaptive responses (Yusuf et al., 2019). It does this by incorporating participatory processes consistent with structured public involvement (SPI) and learning approaches built upon gamification.

SPI was developed by geographers Keiron Bailey and Ted Grossardt (2010) to enhance the quality of engagement and to encourage a more authentic public participation process through the use and integration of geospatial and visual technologies (such as visual renderings and participatory mapping), dialogic group methods (such as using audience response technologies or instantaneous polling), and facilitation techniques. These SPI elements underpin ASERT's participatory process by emphasizing the provision of relevant and accessible information and the use of visual aids and maps (Yusuf et al., 2019). By respecting participants' time through the structuring of engagement events and meetings in ways that give participants public ownership of the participation process, SPI increases participants' confidence in the legitimacy of outcomes (Grossardt et al., 2003). This public ownership and belief in the legitimacy of participation outcomes are also important elements of the ASERT framework.

The ASERT framework emphasizes the use of deliberative and participatory techniques to help diverse groups of stakeholders better understand problems and identify possible actions and solutions, while simultaneously mindful of the social, cultural, and community factors affecting those stakeholders. This emphasis on actionable solutions to enhance resilience also serves to fill a significant gap in current engagement approaches which have tended to focus only on the discursive elements of engagement. Enabling stakeholders to collectively define problems and

identify relevant adaptation strategies allows stakeholders to co-produce practice- and policy-relevant knowledge grounded in stakeholders' values and local contexts, in turn enabling subsequent decision-making processes that consider context-specific information (Yusuf et al., 2019; Few et al., 2007; Preston et al., 2011). This co-production of knowledge is an essential step toward community capacity building, which can lead to the establishment of a groundwork for sound decision making.

ASERT's approach to engaging stakeholders in action-oriented resilience efforts relies on incorporating active learning and social learning mechanisms to motivate learning about issues such as risks, vulnerability, and resilience, and, subsequently, to encourage action to reduce those risks and vulnerabilities, so as to enhance resilience. ASERT's gamified engagement approach is designed to motivate participation, connect participation and learning to resilience outcomes. Moreover, these gameful experiences embed participants within a community so that it increases their confidence in their own knowledge and actions and, in the end, rewards their learning and action.

Gamification enhances engagement by appealing to both internal and external motivation factors to increase participation and action. Gamification presents clear objectives which can be developed into short-term achievable goals. Much like being able to progress to ascending levels in board, card, and video games, participants in a gamified environment are able to earn points and rewards (intangible or tangible), and, in some instances, to compete with others within a community.



ASERT's gamification approach builds on key elements of learning posited by two theories or models: (1) the ARCS motivation model and (2) social constructivist theory. The ASERT approach incorporates four dimensions of learning delineated by the ARCS motivation model (Keller, 1987):

1. **Attention:** increasing the attention and curiosity of participants through the use of different media.
2. **Relevance:** emphasizing the personal relevance of the learning content to the participant.
3. **Confidence:** building participant confidence through the learning process by completing learning tasks.
4. **Satisfaction:** providing satisfaction or reward during the learning process.

Building on the ARCS model, the ASERT approach adopts a gamified learning strategy and combines game elements to address the four dimensions. Gameful experiences capture participants' attention, increase their confidence in their ability to engage, and reward their learning and participation.

The ASERT approach builds on social constructivist theory (O'Leary & Wright, 2005) by focusing on participant-centered learning. In this way, knowledge is developed through interaction between individuals and their environments, and participants learn through interactions with others and the environments that surround their interactions. The ASERT framework emphasizes learning as a social process – one that encourages meaningful learning while participants engage in social activities that support such learning. In this case, the ASERT approach embeds participants within a learning community and connects their learning about resilience to the environment in which those participants reside. That is, through gameful

experiences, participants complete resilience-related activities or tasks that are directly related to their own situations and/or their broader community.

In all, our approach incorporates active learning, social learning, and digital technology to effectively create awareness, educate about risks and response, and encourage resilience.

Participants actively engage with resilience-related material while completing activities and then reflecting on them. They do so within a community of other participant “learners” and experts, from whom they can learn directly and who can help them to contextualize the issues within the real-world setting. Digital technology is used in both “live” and online settings. In live settings, technology is used to visualize risks and vulnerabilities, and to encourage participants to engage in information sharing. Online engagement provides for broader reach and anytime (24/7) learning at the participants’ convenience. In the gamified environment, participants earn points and rewards for completing specific activities and tasks.

## **ASERT for Community Engagement in Virginia Beach Planning for Resilience**

In 2014, the City of Virginia Beach launched the Comprehensive Sea Level Rise and Recurrent Flooding Capital Improvement Program project (known as Sea Level Wise). Its goals were to assess flood hazards and vulnerability, develop programs to reduce risk, and establish short- and long-term plans to increase resiliency (City of Virginia Beach Department of Public Works, 2020). Early in the planning process, engagement with community stakeholders was recognized as a key factor in the success of the project (City of Virginia Beach, 2020). Two years into the comprehensive planning program, Hurricane Matthew caused significant damage to several

Virginia Beach neighborhoods. Residents' responses to the effects of Hurricane Matthew further highlighted the need for the city to engage the public in planning for SLR and recurrent flooding.

Community engagement using ASERT to address SLR and flooding was implemented in two phases, coinciding with aspects of the planning process where public participation was needed to (1) inform and educate residents about the city's planning efforts, (2) ensure planning is responsive to community needs and priorities, and (3) build public support for the city's planning and policy responses. Broadly, the goals of the community engagement efforts were to:

- Provide an inclusive and engaging process that would allow residents to participate in the city's resilience efforts;
- Allow residents to share real-time perceptions of risk and feedback about resilience actions and solutions for implementation in Virginia Beach;
- Collect data on residents' risk perceptions and vulnerability to flooding, willingness to take action, and perceptions regarding different solutions for addressing flood risk and building resilience.

Phase 1 of the ASERT community engagement in Virginia Beach took place across 2017 and 2018 as residents were first introduced to the comprehensive planning program and the initial SLR and flooding projections. This community engagement focus was on understanding residents' concerns regarding flooding and SLR. Phase 2 of the ASERT community engagement occurred in 2019 and accompanied the introduction of the city's preliminary plans and solutions to address recurrent flooding and SLR. This phase emphasized educating residents about the planning process and the proposed solutions and then obtaining feedback about the different

plans and solutions. Data collected from each phase was also intended to help the city validate the assumptions used in the comprehensive analysis, the planning process, and other related decision processes.

Our team worked with staff from the city and its primary consulting firm, Dewberry, in planning and developing the community engagement effort. Information about community engagement opportunities, as well as invitations to the public to participate, were posted to the city's website and to the ASERT website. Additionally, community meetings were promoted in local print and TV stories, and information was distributed through a variety of pathways, such as through the public school system and local environmental nonprofit organizations. The Miles Agency, a Virginia Beach marketing and public relations firm, also supported efforts to publicize the community engagement events and encouraged residents to participate.

### ***ASERT Phase 1***

The first phase of ASERT focused on engaging residents in the early stages of the City of Virginia Beach's *Comprehensive Sea Level Rise and Recurrent Flooding Analysis and Planning Study*. The goals were three-fold: (1) develop improved understanding of residents' tolerance for flooding; (2) identify residents' preferences for adaptation actions; and (3) solicit from residents information about important community assets and flooding impacts throughout the city.

The community meetings took the form of "Flood Resilience Game Nights" which offered five information stations where residents could participate in activities to earn stamps on a game card. Participants checked in at the Welcome Station, completed a participant questionnaire, and

received a game card. With their game card in hand, participants were invited to visit the remaining four stations, each of which addressed a different issue or topic. The Flood Tolerance Station focused on participants' perceptions about the feasibility of driving on flooded roadways or their comfort level with flooding on residential properties. The Adaptation Actions Station guided participants through possible approaches that the community, or individual property owners, might take to address flooding, and then asked about their preferences among each of these different adaptation actions or approaches. Mapping stations included a Travel Disruption Station that showed a large-format printed map of the city and invited participants to note places where travel had been disrupted due to flooding, and the WeTable Station featured an interactive electronic map that allowed participating residents to both pinpoint areas that had been challenged by flood or other related problems and note community assets that might be threatened. Figure 3.1 provides an example of the information available at the stations and the opportunities for participants to provide input into the city's SLR and recurrent flooding planning process.

Beyond their visits to these stations, participants could interact with city staff and the Dewberry consultants. City staff provided floodplain and emergency management information and helped residents to better understand their specific neighborhoods' challenges using maps of current and potential future floodplains due to SLR.

For Virginia Beach residents unable to attend the live Game Night events, community members were also invited to participate in an online format (an online survey and web mapping portal). Information about the online format was provided to Virginia Beach residents on the city's

website and was also shared with residents in a Letter to the Editor published in *The Virginian-Pilot* (Covi and Yusuf, 2018).

<FIGURE 3.1. HERE>

Figure 3.1. Example of engagement station during ASERT Phase 1 Flood Game Night



Participants received a 'passport' that was stamped following completion of activities at different stations.



**Sample Station: Adaptation Actions**

**Information** provided on green infrastructure and nature-based solutions

**Discussion** around how solutions could be applied in the city or on specific property

**Input** collected on preferences for flood adaptation actions the city should pursue and own willingness to act to improve flood resilience

**Sample question:** Which planning and management approaches do you prefer your city to focus on? (select your top three options)

- Preserve open space through zoning
- Establish higher building standards and codes
- Buy-out houses at risk of flooding
- Flood warning systems
- Flood proof houses
- Reduce flood impacts
- Other

Source: Developed by the authors. Photo by Khairul Anuar.

The results and findings from Phase 1 were useful for the city in validating the assumptions used in the comprehensive SLR planning process and in other related planning and policy processes, as well as in validating the SLR and flood models developed by Dewberry.

## ***ASERT Phase 2***

The second phase of ASERT coincided with the development of preliminary city plans for addressing SLR and recurrent flooding (City of Virginia Beach, 2020). The goals of the ASERT Phase 2 community engagement efforts were to: (1) continue to include and engage residents in

resilience planning efforts; (2) educate residents on the planning process and solutions being considered by the city; and (3) solicit feedback from residents on the different components of the Sea Level Wise plan.

The community meetings were structured much like the Flood Resilience Game Nights of Phase 1, but a conscious decision was made not to use the Game Night terminology. As the community meetings were being planned, the Virginia Beach community experienced some significant flooding events, and it was noted by members of the community that “flooding is serious business.” As such, the Game Night label might be seen as trivializing the issue, which, in turn, could undermine perceptions of the city’s severe need for plans to address resilience-related issues.

Phase 2 community meetings were structured around six stations, based on the different components of the city’s draft response plan. Participating residents were invited to engage at different stations and to provide input into the planning process through a scenario-based model where participants assumed the role of a City decision-maker who needed to address SLR and flooding. The stations provided information about the solutions, policies, and programs proposed in the response plan. Based on this information, participants completed prioritization exercises and provided feedback. Participants received portfolios to track their engagement at each of the stations; as they participated in the different stations, they received a stamp on their portfolio.

Each station was hosted by staff from the City of Virginia Beach and by consultants supporting the planning process. These hosts answered participants’ questions and helped residents to better

understand the different resilience strategies. In addition to a Check-in Station, there were five stations that focused separately on: (1) updating land use codes, policies, and building standards; (2) city-wide structural solutions, including protection alternatives and a summary of different configurations of structural alternatives; (3) site-level structural solutions, such as flood mitigation strategies that could be undertaken by homeowners and property owners; (4) natural and nature-based solutions for flood mitigation; and (5) the Community Rating System and flood insurance. For Virginia Beach residents unable to attend the live community meetings, participation was also available in an online format (via an interactive website).

We will use the examples of the Policy-based Solutions Station and the Site-level Solutions Station to illustrate how Phase 2 of ASERT engaged residents in the planning process and collected useful information that could support the city's next steps in planning. The Policy-based Solutions Station provided participants with information about the process used to develop policy solutions, the overarching goals that underpin policy development, and the different policy strategies to respond to SLR and recurrent flooding (see Figure 3.2). Participants at this station completed a prioritization activity to identify the policy goals that residents deemed most important. This information could be helpful for city decision making, allowing for consideration of trade-offs between policy solutions.

At the Site-level Solutions Station, participating residents could learn about building-level mitigation strategies for structures that could be implemented in order to provide flood protection, such as elevating structures, dry floodproofing, and wet floodproofing. Participants were asked to prioritize factors that would most influence their decisions to undertake mitigation



to protect their respective residence or business property. Their responses identified that the most influential factors were: (1) technical effectiveness, (2) cost effectiveness, and (3) availability of grant funding. An understanding of the importance of these factors could help City staff in further developing and prioritizing site-specific solutions to reduce the impacts of SLR and flooding. Specifically, information related to risk reduction effectiveness, cost effectiveness, and the availability of grant funding should be emphasized in communications with residents about how they can protect their homes and businesses.

<FIGURE 3.2 HERE>

Figure 3.2. Example of engagement station during ASERT Phase 2 Community Meetings

**Sample Station: Policy-based Solutions**

**Information** provided on the draft Policy Response Report, process underpinning development of the report, and proposed policy action items  
**Discussion** provided policy details and answered questions about different policy responses

**Input** collected on priorities for policy goals and support for specific policy solutions. Questions were designed to communicate the key elements of the policy solution and solicit feedback on public support

**Sample question:** The City can change land use and floodplain ordinances and regulations, building codes, and construction standards to enhance the flood resilience of buildings and neighborhoods. By ensuring that structures are designed, sited, and constructed to be more resilient to future flood risks, governments can reduce the amount of potential damage from sea level rise, storms, and flooding. Examples of actions that the City could take include:



Updating the City’s land use codes and policies to include development requirements that consider sea level rise projections, changes in rainfall, and increased flood risk.	Providing specific guidance to developers on the sea level rise and precipitation projections that should be considered to assess the flood risks for projects.
Requiring lots have buildable area above the base flood elevation, have dryland access, and meet higher standards.	Ensuring that all development proposals provide for adequate drainage.
Requiring mechanical and electrical systems to be elevated.	Increasing building elevation requirements for new structures.

However, these stricter requirements could result in higher construction and/or maintenance costs. Do you support or oppose the City changing ordinances, regulation, codes and/or standards to ensure that structures are designed, sited, and constructed to be more resilient to future flood risk?

Source: Developed by the authors.

**Online ASERT Format**

The ASERT community meetings were supplemented by online engagement options. During Phase 1, Virginia Beach residents unable to attend Flood Resilience Game Nights were invited to

provide input into the planning process by completing an online survey and identifying community assets and challenges via a web mapping portal.

The online engagement effort for Phase 2 was more comprehensive and utilized an interactive website to provide information, engage participants in conversation, and solicit feedback from Virginia Beach residents. The approach incorporated active learning and social learning mechanisms built upon social constructivist theories and motivation models. This meant that individuals would be engaged through gameful or scenario-based models of decision-making. The scenario had residents assume the role of a City decision-maker and was framed in this way:

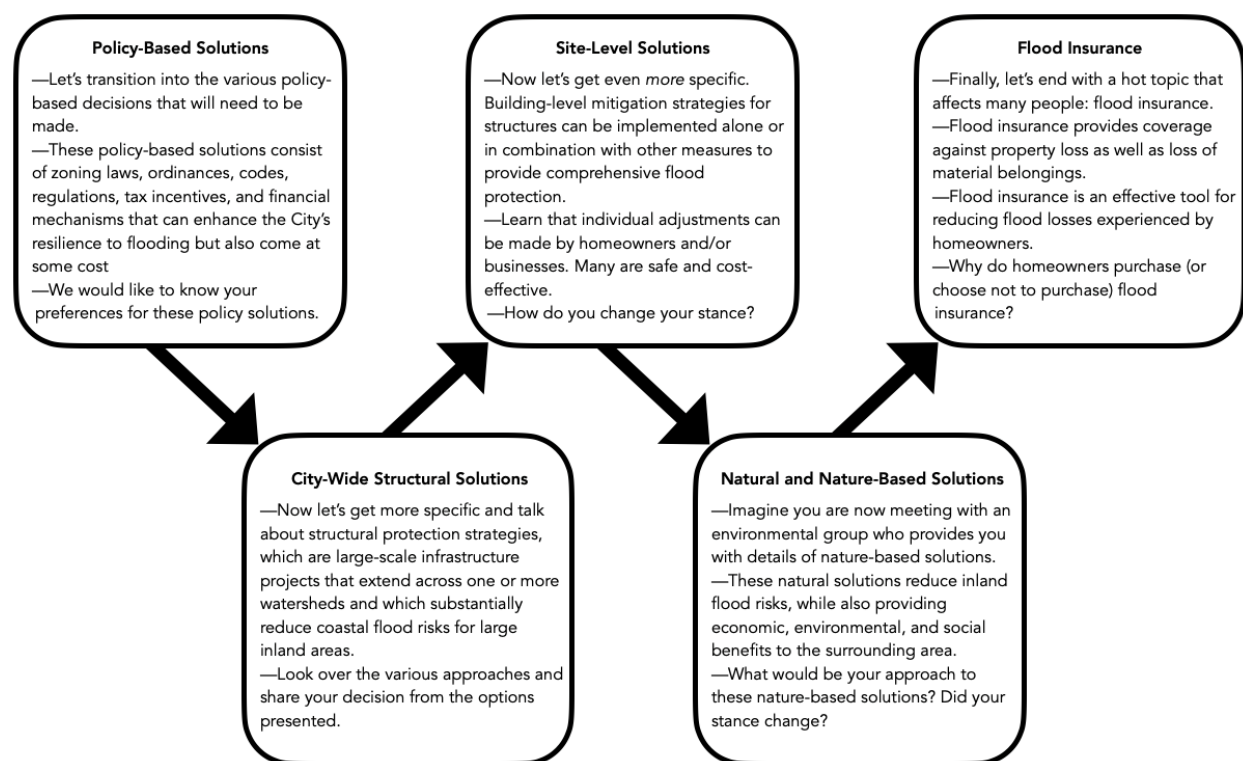
*The City of Virginia Beach has undertaken an extensive process to evaluate and prioritize policy and planning responses as part of the City's comprehensive response to flooding. Imagine you are a key decision maker for the City of Virginia Beach who has been asked to consider several of these policy and planning options. As such, you will need to learn about the Comprehensive Flooding Response Plan process and resulting policies and solutions. You are also a resident of Virginia Beach and are concerned about the challenges facing the City regarding resilience, emergency response, cost, and livelihood. Before you make any decisions, you decide to gather as much information about potential response plans as possible.*

In this scenario, participating residents (role-playing City officials) see themselves as making decisions for the larger community. And, like the community meeting participants, the online participants navigated an introductory station and five topical stations that addressed different aspects of the city's flood resilience planning efforts. At each station, participants were given a specific task or scenario, all centered on learning more information about various solutions and

responses to SLR and flooding. Figure 3 summarizes the narrative structure and the sequence of the stations. Online participants were presented with a rather informal tone through which to navigate the planning topics. This informal (but engaging) tone was selected to help offset the amount of data and information that participants would be asked to sift through as they interacted online.

<FIGURE 3.3 HERE>

Figure 3.3. The narrative structure and five stations of the Phase 2 online engagement component



Source: Developed by the authors.

### ***Participation in ASERT Engagement Activities in Virginia Beach***

A total of 397 residents participated in the ASERT community meetings (207 in Phase 1 and 190 in Phase 2) and an additional 159 participated online (100 in Phase 1 and 59 in Phase 2). The characteristics of Virginia Beach residents who participated are shown in Table 3.1.

Table 3.1. Characteristics of ASERT participants

<i>Age categories</i>			
	Community Meetings (N=353)	Online (N=149)	All (N=502)
18-24 years	1.7%	2.0%	1.8%
25-44 years	13.9%	28.9%	18.3%
45-64 years	40.8%	51.0%	43.8%
65 years and over	43.6%	18.1%	36.1%
<i>Race/ethnicity</i>			
	Community Meetings (N=381)	Online (N=157)	All (N=538)
White	92.1%	82.8%	89.4%
Black or African American	2.6%	5.7%	3.5%
Hispanic/Latino	1.0%	1.9%	1.1%
American Indian or Alaskan Native	1.3%	0.0%	1.0%
Asian	0.0%	1.3%	0.1%
Multiracial	1.6%	1.9%	1.7%
Other	1.3%	6.4%	2.8%
<i>Highest level of education completed</i>			

	Community Meetings (N=384)	Online (N=156)	All (N=540)
High school diploma/GED or less	2.3%	3.2%	2.6%
Trade/professional school/ Associates degree	6.5%	8.3%	7.0%
Some college	13.3%	13.5%	13.5%
Bachelor's degree	40.1%	38.5%	38.5%
Graduate degree	36.2%	36.5%	36.3%
<b><i>Residential tenure in Hampton Roads</i></b>			
	Community Meetings (N=338)	Online (N=151)	All (N=489)
5 years or less	6.8%	9.3%	7.6%
6 to 10 years	5.0%	9.3%	6.3%
11 years or more	88.2%	81.4%	86.1%
<b><i>Rating of personal vulnerability</i></b>			
	Community Meetings (N=380)	Online (N=153)	All (N=533)
Extremely low	8.7%	12.4%	9.8%
Somewhat low	4.7%	9.1%	6.0%
Neither low nor high	21.8%	19.0%	21.0%

Somewhat high	25.3%	29.4%	26.4%
Extremely high	39.5%	30.1%	36.8%
<b><i>When SLR will have an impact on Hampton Roads</i></b>			
	Community Meeting (N=397)	Online (N=159)	All (N=556)
Now	63.5%	45.3%	58.3%
1 to 5 years	14.1%	20.1%	15.8%
6 to 10 years	9.8%	14.5%	11.1%
11 to 25 years	5.8%	13.2%	7.9%
26 to 50 years	4.0%	4.4%	4.1%
51 or 100 years	2.8%	2.5%	2.7%

Source: Developed by the authors.

The overwhelming majority (80%) of all participants were over 45 years of age. The age group of 25 to 44 years had a higher proportion participating online (29%), when compared directly to the proportion of this age group participating, live, in the community meetings (14%). Combined across community meetings and online options, the gender of the participants was almost equally split between males and females. In terms of race, participants were overwhelmingly White (89%). More racial minorities participated via the online engagement options.

Participants were highly educated - three quarters (75%) had at least a college degree. An overwhelming majority (93%) owned their homes or were in the process of buying a home. Most had lived in the Hampton Roads region for a long time. Slightly more than 85% had lived in the area for 11 years or more, while only 8% of participants had lived in the region for five years or less.

Participants also clearly perceived themselves to be vulnerable to flooding. When asked the question ‘How would you rate your personal vulnerability to flooding due to sea level rise?’ almost two-thirds (63%) rated their personal vulnerability to be somewhat or extremely high. They also perceived that SLR would have a more immediate impact on Hampton Roads. More than half believed that SLR was having an impact now, while an additional 16% indicated that the impacts would be felt in the next five years.

### **Key Facets of Effective Community Engagement**

The previous section highlights the way in which the ASERT framework was applied in the City of Virginia Beach as community engagement efforts to support the SLR planning process. These engagement efforts were designed to:

- (1) Provide an inclusive and engaging process that would allow residents to participate in their city’s resilience efforts;
- (2) Provide information about resilience in an environment that would encourage social learning to promote attitudinal and behavioral change that would result in improved resilience and public support for resilience solutions;

- (3) Allow residents to give real-time perceptions of risk and feedback about resilience solutions in their communities and city.

These facets of effective community engagement are general enough to fall in line with scholarship on community engagement but are specific enough to be tailored to the needs of a specific city (in this case Virginia Beach) and its residents. Each facet revolves around connecting residents to city planning efforts and staff supporting these efforts in meaningful ways that move beyond the typical information sharing sessions residents may have experienced. The City of Virginia Beach was genuinely interested in accumulating data from its residents, and this data, due to our engagement approach, was captured in real-time immediately after learning about or having a conversation with someone with first-hand insights about the planning process and the city's resilience efforts. This model was able to close the temporal gap between the time when residents intake information and when their perceptions of the issue(s) are gathered.

### ***Providing an Inclusive and Engaging Process***

When residents entered the engagement space (during Game Nights and Community Meetings), they received game cards to track their accumulation of stamps that they earn for participating at each of the stations (at the Welcome Station participants could receive a stamp just for completing the questionnaire that was designed to build their confidence in the process). Each participant completed a questionnaire that would allow us to track demographic information and perceptions of risk, anonymously. Additionally, participants were informed that if they completed the entire Passport or Portfolio game card they would be entered into a drawing for an Amazon gift card of moderate value. The intent behind the game card was to gain their attention



for each of the different aspects of resilience. In Phase 2, for example, the focus was on five facets of the City's resilience plans: Policy-based Solutions; City-Wide Structural Solutions; Site-Specific Solutions; Natural and Nature-based Solutions; and Flood Insurance. So, if participants were primarily interested in the site-specific solutions for their neighborhood (and not much else), they would be encouraged, by way of completing the game card, to pay attention to other facets of the resilience plan. Encouraging their sense of satisfaction for completing the game card, along with providing the possibility of receiving a monetary prize, were the driving forces in this design. Overall, our approach offered an inclusive space that was apolitical and that provided multiple methods of engagement for a wide array of participants across multiple areas of interest (e.g., natural versus structural methods of resilience).

### ***Encouraging Social Learning***

One of the most popular methods of engagement for our participants was being able to speak with a representative from the City or a consultant who was directly involved in the design, development, and/or deliberation of the proposed resilience efforts. This design facet positioned the ASERT team as a "facilitator" as well as a designer following Moore's (2017) typology of communication experts' positionality in community projects.<sup>1</sup> Having these experts mediate the technical aspects of the proposed actions helped to erode communication barriers inherent within the traditional technocratic delivery of information from the one to the many, and helped to localize global issues (Grabill & Simmons, 1998). This model encouraged participants to learn directly from those involved in the decision-making, oftentimes at the highest levels, so aspects of interpersonal and positive ethos also accompanied the technical delivery of information on a person-to-person basis. The social component of risk and environmental communication is

deeply rooted in issues such as trust and positive relationships (Slovic, 2010), so learning within social contexts, rather than through online or other media outlets, helps to enact the constructivist model of learning, based on non-technocratic models of technical and risk communication (Blythe et al., 2008).

### ***Soliciting Real-time Directed Feedback from Residents***

After reading the material (posters, handouts, etc.) and speaking with a representative presenting information at each station, participants were then asked to complete a questionnaire about their immediate perceptions of the topic. The real-time nature of this feedback collection ensured that there would be no gap in time between the reception of the message and the recording of perceptions. This allowed for a more accurate picture of the residents' perceptions and preferences. Too often, surveys are distributed or completed far after the moment of experience. During this lag, technical information can be lost, and the level of emotional engagement or urgency—even the sense of community from being among other like-minded individuals—might dissipate and ultimately change the nature of residents' responses.

### **Lessons Learned for Communication and Stakeholder Engagement**

Implementing the ASERT framework to communicate about and solicit public input into the resilience planning process in the city of Virginia Beach yielded some important lessons, both about the public participation process and about the framework itself. Since the academic team worked in partnership with members of the city's staff and its contractors, a number of logistical compromises had to be made so that the ASERT implementation was realistic given the city's needs; however, these changes were not always ideal. For example, while ASERT is

specially designed to be a process that welcomes those who might feel excluded in a traditional public meeting, soliciting participation through advertising must make this clear to those audiences that ordinarily do not attend public meetings. For this project, advertising was traditional and not targeted. Consequently, the audiences attending the ASERT meetings reflected only part of the demographic diversity of the city. In addition, some attendees declined to participate in ASERT activities because they expected a traditional public meeting format.

Sea level rise resilience planning in the City of Virginia Beach and in many other vulnerable neighborhoods can be a highly charged and emotional topic, particularly in those neighborhoods that have experienced acute flood damage. The use of the ASERT approach proved effective at diffusing tensions because it allowed individuals who had been affected to focus their attention one-on-one with a city staff member, while other activities allowed participants to share their opinions and preferences without necessarily having to speak publicly. Individuals were able to learn more about the issue from a neutral and scientific viewpoint, rather than only hearing the viewpoints from the city or a disgruntled resident. Overall, the ASERT framework stimulated social interaction among residents and city/contractor staff as well as among neighbors, which created an environment that encouraged curiosity, empathy, and cooperation, laying the groundwork for a greater understanding of the perceptions and knowledge within the community about managing the risks of sea level rise. This project found that gamification is an approach that can be very successful in recruiting and engaging audiences that do not ordinarily attend public meetings, such as families and young adults. In our experiences implementing ASERT, both in the city of Virginia Beach and in other test venues (such as on a college campus), these audiences were eager to participate. However, we did encounter resistance to the idea of pairing the serious subject of flooding with games, especially

among residents of affected neighborhoods and the staff who work with them. Care should be taken in delineating how the gamified approach can be designed to encourage broad participation and learning, and not to trivialize the issue or the topic being addressed. We might offer, as a caveat, the potential for misapplication; applying a gameful approach to more serious topics might lead to resistance or to accusations of not taking the issue seriously. The potential for misapplication will depend on the demographics, culture, and historical contours of the community, since risk is a locally constructed paradigm (Grabill & Simmons, 1998).

The online component of ASERT was an important addition to the community meeting that we did not originally envision. ASERT uses gamification to engage and to solicit input from residents who do not traditionally attend public meetings. This is facilitated via different modes, including the option of online participation. Younger residents are comfortable with online environments, and those residents who are not directly affected by the issue (in this case, flooding) may be solicited more easily by offering a game environment online. When the City of Virginia Beach public meetings needed to be rescheduled, months later, due to a city-wide emergency, the website allowed residents to continue to engage and participate as their schedules allowed. A more gamified and well-advertised website might have yielded even better participation than in-person events. While social learning might be reduced by online participation, links to social media platforms within the website might help to bring that component into an online environment.

Despite the efforts of the ASERT team, the City, and the City's consultant to promote the community meetings in order to improve participation beyond the typical turnout for public meetings, participation among residents was low, with a total participation rate of less than 1% of the city's residents. Furthermore, the participants who completed demographic questionnaires

were mostly white, older than 45 years of age, highly educated, homeowners, and long-term residents. This is consistent with other research findings and experiences about the demographics of those who actively engage or participate in public meetings.<sup>ii</sup> In addition, event marketing efforts may not have been as specifically targeted at minority communities as would have been desirable.

The participatory and gamified elements of the ASERT approach were designed to appeal to a broader audience beyond those who would normally show up at community meetings, public hearings, or community events. However, the messaging approaches used to publicize the community meetings and interactive website failed to reach these segments of the population, as evident in how those who did participate skewed toward those who are traditionally more engaged. We also observed a disconnect between the ASERT approach and the participants who did show up at the community meetings. Given the way in which these participant demographics skewed towards an older population, some participants noted that the concept of gamifying something as serious as recurrent flooding seemed a bit off-putting. The “playful” elements of the engagement process (e.g., candy at the Welcome Station, stamps at each of the other five stations, and competition with other participants) did not always match the expected tenor of the meetings. Some participants were uninterested in the competitive approach and social learning opportunities at the different stations. The researchers consider the lack of age diversity to be a valuable lesson learned for future communication and engagement strategies.

Also, we could have paid more attention to accessibility. The game cards were all in printed text and our team offered little in terms of assistive technologies for those with auditory and visual disabilities. We did provide handouts of the posters, so as to minimize the limitation of trying to see a poster that was six feet off the ground, but for future iterations of ASERT

application, it would be useful to think more intentionally about community members who require more assistance in terms of access and inclusion.

### **Applications of ASERT to Other Contexts**

The ASERT approach is two-pronged. First, it is participatory, having been deliberately designed to be conducted in a setting that allows for and encourages stakeholders to interact with each other, as well as with community leaders, planners, and policymakers. Second, it relies on the incorporation of gamification practices to encourage both active and social learning in an informal and supportive setting. With the addition of the gamification elements, participants are motivated to earn rewards while simultaneously sharing their experiences and learning about risk factors and resilience solutions. As participants moved through the various stations, they encountered others asking questions and sharing resilience-related experiences. These interactions provided spontaneous opportunities to discuss specific areas of concern, and added to the sense of purpose that residents bring to experiential events.

The ASERT approach fits well with the International Association for Public Participation's Spectrum of Public Participation model (International Association for Public Participation USA, n.d.), a tool that can be used by a variety of public-facing entities to conceptualize public participation in decision-making processes. As detailed in this spectrum, public participation goals might range from informing, to consulting, to involving, to collaborating, to empowering. Depending on the issue, informing or consulting with the public may be appropriate. For example, if street sweeping will take place on a specific day of the month in a specific neighborhood, informing is the appropriate level of engagement. In other situations, such as the

replacement of an elementary school, a higher level of involvement is required. It is reasonable to envision the use of ASERT in environmental-related contexts such as those listed below, where informing and consulting would be logical first steps:

- Transportation planning to determine the siting of new bus routes or bicycle lanes;
- Recreational planning such as for golf courses and walking, running, and hiking trails;
- Waste and water management planning, such as landfill placement or wastewater pipeline routing;
- Controversial topics, such as managed retreat or changes to land use and development policies in the face of recurrent flooding.

In the context of professional and business organizations, such as a Chamber of Commerce, a community development foundation, or an area or regional real estate association, ASERT's education-forward combination of action-oriented presentations and learning stations, along with its gamification component, would offer a flexible platform for professional members and leaders to go beyond their normal consultation circles and identify fresh ideas and opinions from community members and business segments that previously might not have been consulted or included.

Similarly, ASERT could be used by the tourism and entertainment sectors for long-term environmental-related planning. Rather than assuming what residents would support and favor, the ASERT framework could easily be used to identify a wider set of preferences, and could be specifically designed to include representation from sectors whose interests are not always

captured, including teens and pre-teens, seniors, those in a city's immigrant communities, LGBTQ+ residents, and other overlooked or underserved groups.

Within the broader domain of climate change, the ASERT framework could be useful as a starting point to engage a wide range of youth more tively in both discussion and action about climate change and resilience. The ASERT framework, with its reliance on gamification and technology, could be appealing to younger participants, if marketed effectively, and if were coupled with the use of social media and other technologies to enhance social learning by creating competitions around completing resilience actions.

Furthermore, ASERT may be useful in connecting youth across geographic space in a focused effort to communicate information about climate change, exchange information and ideas, and spur innovation and creative solutions that will help address climate change. In this sense, the ASERT framework could support the development of a cadre of youth activists and advocates around the issue of climate change.

### ***References***

Bailey, K. and Grossardt, T. (2010). Toward structured public involvement: Justice, geography and collaborative geospatial/geovisual decision support systems. *Annals of the Association of American Geographers*, 100(1), 57–86.



Blythe, S., Grabill, J. T., and Riley, K. (2008). Action research and wicked environmental problems: Exploring appropriate roles for researchers in professional communication. *Journal of Business and Technical Communication*, 22(3), 272–298.

DOI: <https://doi.org/10.1177/1050651908315973>.

City of Virginia Beach. (2020). Virginia Beach Sea Level Wise Adaptation Strategy. Accessed at: [https://www.vbgov.com/government/departments/public-works/comp-sea-level-rise/Documents/20200330%20FullDocument%20\(2\).pdf](https://www.vbgov.com/government/departments/public-works/comp-sea-level-rise/Documents/20200330%20FullDocument%20(2).pdf). [Accessed: 20 May 2020].

City of Virginia Beach. (n.d.). Sea Level Wise. Accessed at: <https://www.vbgov.com/government/departments/public-works/comp-sea-level-rise/Pages/default.aspx>. [Accessed: 20 May 2020].

City of Virginia Beach Department of Public Works. (2020). Virginia Beach Sea Level Wise. Accessed at: <https://storymaps.arcgis.com/collections/5bde0a2b4cec4bf7966d0fc5d564d9d9?item=1>. [Accessed: 25 May 2020].

Covi, M. and Yusuf, W. (2018). ‘Letter: “Game nights” to seek flood input,’ *The Virginian-Pilot*, 21 January [Online]. Accessed at: [https://www.pilotonline.com/opinion/letters/article\\_565bbdc7-475c-5ace-b052-e37c8990beed.html](https://www.pilotonline.com/opinion/letters/article_565bbdc7-475c-5ace-b052-e37c8990beed.html) [Accessed: 5 May 2020].

Few, R., Brown, K., and Tompkins, E.L. (2007). Public participation and climate change adaptation: avoiding the illusion of inclusion. *Climate Policy* 7(1), 46–59.

DOI: <https://doi.org/10.1080/14693062.2007.9685637>.

Grabill, J. T., and Simmons, W. M. (1998). Toward a critical rhetoric of risk communication: Producing citizens and the role of technical communicators. *Technical Communication Quarterly*, 7(4), 415-441. DOI: <https://doi.org/10.1080/10572259809364640>.

Grossardt T., Bailey K., and Brumm J. (2003). Structured public involvement: problems and prospects for improvement. *Transportation Research Record* 1858, 95–102.

DOI: <https://doi.org/10.3141/1858-13>.

International Association for Public Participation USA (n.d.). IAP2 Spectrum. Accessed at <https://iap2usa.org/resources/Documents/Core%20Values%20Awards/IAP2%20-%20Spectrum%20-%20stand%20alone%20document.pdf>. [Accessed: 15 May 2020]

Keller, M. J. (1987). Development and use of the ARCS model of instructional design. *Journal of Instructional Development*. New York: Springer Link.

Moore, K. R. (2017). The technical communicator as participant, facilitator, and designer in public engagement projects. *Technical Communication*, 64(3), 237-253.

O'Leary, J., and Wright, F. (2005). Social constructivism and the group-as-a-whole. *Group*, 29(2), 257-276.

Preston, B. L., Yuen, E. J., and Westaway, R. M. (2011). Putting vulnerability to climate change on the map: a review of approaches, benefits, and risks. *Sustainability Science*, 6(1), 177–202.

DOI: <https://doi.org/10.1007/s11625-011-0129-1>.

Slovic, P. (2010). *The Feeling of Risk: New Perspectives on Risk Perception*. New York: Earthscan.

Yusuf, J-E., St. John, B., Rawat, P., Covi, M., Nicula, J. G., and Considine, C. (2019). The Action-oriented Stakeholder Engagement for a Resilient Tomorrow (ASERT) framework: An effective, field-tested approach for engaging stakeholders. *Journal of Environmental Studies and Sciences*, 9(4), 409-418. DOI: <https://doi.org/10.1007/s13412-019-00556-x>.

---

<sup>i</sup> Moore's article, "The Technical Communicator as Participant, Facilitator, and Designer in Public Engagement Projects," reports on a field research study of professional public engagement specialists and their efforts to cultivate dialogue in a community about a prospective railroad corridor project. The article argues that technical communicators involved in public engagement initiatives must be participants, facilitators, and designers of the dialogic process.

<sup>ii</sup> A partial explanation of this demographic may also reflect the city's race and origin makeup. The U.S. Census Bureau's Quick Facts for Virginia Beach city, July 1, 2019 population estimate, indicates the white population for the city at 67.4%, with the Black or African American population estimated to be 20.3% (<https://www.census.gov/quickfacts/virginiabeachcityvirginiacounty>).