A. NATURE OF REQUEST

SUNY College at Old Westbury requests ***$30,000*** in funding from the NEH Division of Public Programs for a Digital Projects for the Public Discovery Grant to create a design plan for *Virtual Aquapolis*, an interactive virtual reality humanities project about the past, present and future of New York Harbor. *Virtual Aquapolis* will incorporate a combination of elements—archival photography, film and audio, animation, underwater video, expert interviews and narration—to explore how human culture, values and practices have altered the harbor's underwater ecosystems over time, and how the natural world has shaped the city above. With the aim of reaching a wide and diverse audience*, Virtual Aquapolis* will be designed to engage the public in multiple ways: through gallery and museum installations; as a teaching resource; and through a series of free public events on NYC's Governors Island waterfront. The *Virtual Aquapolis* website will offer a free mobile phone and VR helmet-compatible download of the documentary.

Drawing on work from leading humanities scholars,*Virtual Aquapolis* will examine how discourse around ethics, labor, industry and sustainability, along with a shifting awareness of humans' reciprocal connection to nature, has informed the harbor's past and present, and shapes collective visions for the harbor's future. Users will have a unique opportunity to experience both gradual changes and striking events from beneath the harbor's surface. While popular imagination often regards New York's waterways as nether regions filled with detritus and dark oddities, being virtually immersed in and traversing the harbor's history from the perspective of underwater plants and animals, will offer a unique opportunity to draw new connections. This interdisciplinary project is a collaboration between storytellers. As the core team for *Virtual Aquapolis*, we approach storytelling as multimedia artists, documentarians and technology experts, employing an ever-evolving set of emerging media tools, techniques, and processes to convey ideas, tell stories and engage audiences. The expertise, extensive research and complex stories unearthed by our humanities scholar consultants will serve as the foundation for this project. For the discovery phase of *Virtual Aquapolis,* our humanities consultants will guide us in developing the historical timeline and humanities themes for the project, while our media consultants will assist in planning the interactive and user-experience components. The discovery process will take place in three stages: an initial online consultation meeting, a day-long full team workshop, and written feedback on our design drafts. The final Design Document, the outcome of this Discovery Grant phase, will include:

- a summary of narrative and thematic elements;
- a historical timeline outlining the milestones and events to be included in the narrative;
- a detailed technical plan outlining best practices for capturing 360° underwater video;
- strategies for finalizing the future scenarios;
- aesthetic approaches for mixing archival elements, animation and underwater 360 video;
- wireframes of the VR design and user experience, as well as the accompanying website;
- storyboards and interpretive text that illustrate the UX design plan as it pertains to communicating narrative, thematic and aesthetic content;
- specs for programming VR interactivity and outputting for distribution;
- a sustainability plan outlining strategies to adapt to perpetual changes in technology;
- an outreach, distribution and audience engagement plan; and
- budgets and timelines for the next project phases: prototyping and production.

B. HUMANITIES CONTENT

SIGNIFICANCE OF SUBJECT AND RELEVANCE TO THE PUBLIC

NY harbor is one of the world's largest natural harbors, and was once a maze of marshland and estuaries, home to 55 unique ecological communities. Since the arrival of the Dutch in the 17th century, it has undergone radical change. While the harbor has been shaped by a unique convergence of geography, ecology and human culture, its story connects to a larger one shared by many other coastal cities grappling with the impacts of global climate change. Addressing these impacts will ultimately be an exercise in collectively rethinking human values. Sally Kitch, Director of the Institute for Humanities Research at Arizona State University, notes:

> Technological innovation may be part of the solution chosen, but addressing the deeper cultural and political factors implicated in both the causes of and solutions to the challenge(s) is of equal or greater importance than such innovation (9).

With this in mind, *Virtual Aquapolis* draws on a number of related humanities disciplines, including history, philosophy, historical ecology, Indigenous studies, urban studies, cultural geography, environmental humanities, environmental philosophy, environmental history, cultural anthropology and political ecology. It is an interdisciplinary project bringing together scholars who are writing about nature as "part of social and cultural realms" and "re-envisioning nature as pervasively and enduringly shaped by humans" ("What is Environmental Humanities?").

HUMANITIES THEMES AND QUESTIONS

Virtual Aquapolis will explore key questions about how humans position themselves in relation to the natural world. How does the human propensity for transforming natural systems and geography connect to notions of self-preservation, self-interest and self-destruction? How do geography and the natural world influence these notions and transform human systems? In relation to New York Harbor, these questions suggest a number of overlapping humanities themes. The themes discussed below are our starting point: lines of inquiry that will evolve as we collaborate with, and learn from our humanities experts.

Human culture and nature: connection and disconnection

Drawing on David Stradling's *The Nature of New York: An Environmental History of the Empire State,* which organizes New York's ecological history in relation to varied definitions of human-nature relationships, *Virtual Aquapolis* will consider how culture and belief systems are intrinsic to the fate of humans and the harbor's ecosystems. Stradling's work tracks the environmental impacts of urbanization and industrial growth alongside cycles of destruction, remediation and environmental philosophy. Similarly *Virtual Aquapolis* will consider how a shift from a resource-based economy to global trade and industrialization connects with evolving cultural ideas around nature, and how these factors continue to impact survival for both humans and local ecosystems. To explore this theme, we will also consider John Waldman's *Heartbeats in the Muck: A Dramatic Look at the History, Sea Life, and Environment*, an ecological history chronicling the trajectory of New York harbor's underwater ecosystems.

How geography shapes culture and how culture shapes geography

Intertwined with questions around humans' connection to nature are those examining our reciprocal relationship with geography, and how, like the waterways that comprise the harbor, the geography that encloses it can be understood as an expression of human values.

Echoing Waldman and Stradling's work, Ted Steinberg chronicles the relationship between New York City's ecological and human history, interpreting the city's geography as one engineered by both nature and culture. In *Gotham Unbound: The Ecological History of Greater New York,* he notes:

> The bulk of the landscape that Hudson saw on his 1609 visit has vanished -- erased by storms, wave action, rising sea levels, and the transformation of the land and waterscape. The changes have been so vast and thorough that it is not even possible to pinpoint with certainty where Hudson ventured on his travels (3).

Gotham Unbound documents centuries of draining, dumping, and shoreline expansion, as well as underwater demolition and excavation, all as part of a relentless campaign to reorder the City's geography to accommodate ever-expanding human endeavors. Steinberg's work will inform our investigation of the human/nature connection for *Virtual Aquapolis* and serve as the foundation for examining New York harbor as a natural formation turned cultural construct.

The Commons: New York harbor as a shared resource

A third overlapping theme explores the relationship between shifting cultural understandings of the harbor as a shared space, or "hydrological commons". This theme will chart cycles in the health of the harbor against changing notions of private, public or common land, waterways and natural resources. In considering this dimension of the harbor, we will draw on David Soll's *Empire of Water: An Environmental and Political History of the New York City Water Supply,* which tracks the history of New York City's water supply against the evolution of environmental philosophy and political policy, reaching beyond the mechanics of public works to investigate water as a collective resource. Soll's research connects "water supply expansion to larger themes of public space and the churning of the built environment" (5). He explores how the ultimate separation between the city's local waterways and its drinking water supply dampened public resolve for environmental regulation, allowing the harbor to be radically reshaped to accommodate maritime travel and urban sprawl, and regarded as a collective dumping ground for sewage and industrial waste. *Virtual Aquapolis* will chronicle these impacts, linking the ever-changing underwater environment to larger cultural and ideological shifts around water as a collective responsibility and common resource. We will explore shifts in the structures of rights and mutual responsibilities around resources throughout the centuries and trace how these relate to changes in the underwater environment of the harbor (Mccay, 20). The project will also explore how notions of the harbor as a commons inform contemporary environmental movements, capturing the activities of community-led restoration initiatives and community monitoring projects including those led by Global Water Future, an Indigenous-led water quality testing initiative, and the Billion Oyster Project (BOP) restoration project. Both initiatives understand water as a collective resource, as BOP's vision statement notes: "The harbor is a world-class public space, well used and well cared for—our Commons."

Multiple futures / "futures thinking"

The future section of the *Virtual Aquapolis* immersive VR experience will be an exploration of multiple different scenarios for the future iterations of NY Harbor. As Ted Steinberg writes:

> Historians are not in the business of prediction, but exploring ecological history, which studies humankind's struggle with natural constraints is a uniquely good way to begin a discussion about the future of the world's first megacity (xxiv).

Similarly, Sverker Sörlin in “Reconfiguring Environmental Expertise” writes:

> “Humanities’ focus on ethics, value formation, concepts, ideas, and decision-making, based on reservoirs of historical and cultural knowledge, [is what’s] necessary for taking on the enormity of future global change” (22).

Building on this in “How Can Humanities Interventions Promote Progress in the Environmental Sciences?” Sally Kitch identifies “a process of negotiation, reconciliation, and synthesis” as scholars consider future scenarios as an important project of the humanities. She writes:

> [F]utures thinking that is historically and culturally grounded but also boldly imaginative… invites the production of multiple future scenarios that reflect the various framings of the community’s environmental challenges already identified, as well as the varied knowledge communities, values, and cultural perspectives assembled around the table (8-9).

The process of drawing on history, ethics and cultural knowledge to explore multiple future scenarios described by Kitch, Sörlin and Steinberg will serve as the blueprint for how, in conversation with our humanities scholar consultants, we will envision a range of possible futures for the harbor in Virtual Aquapolis.

RESOURCES ON WHICH PROJECT WILL DRAW

Our humanities consultants’ research will lay the foundation for *Virtual Aquapolis*. A short sample of key consultants’ work is listed below. Please see our bibliography and CVs for a more extensive review. Other potential sources that will be incorporated into the project include archival material (newspapers, audio, photography, film) selected from source bibliographies.

America’s Early Whalemen: Indian Shore Whalers on Long Island, 1650–1750

John Strong's work explores the Shinnecocks, Unkechaugs and Montauketts relationship to their maritime environment, emphasizing Native Peoples contributions to colonial America. Author Nancy Shoemaker calls it, “A deeply researched, highly readable account from the leading authority on Long Island Native history” (University of Arizona Press).

Empire of Water: An Environmental & Political History of the NYC Water Supply

Carl Smith of the American Historical Review writes "David Soll ably deepens our understanding of New York's water supply” in “a political and environmental, as opposed to technological, history" (The American Historical Review). The book explores how New Yorkers’ relationship to water transformed the city and charts shifts in environmental consciousness throughout the twentieth century.

Gotham Unbound: The Ecological History of Greater New York

Sam Roberts of the NY Times writes, "Steinberg challenges the conventional argument that geography is destiny.” Publishers Weekly describes it as a “fascinating, encyclopedic history” of “New York City through an ecological lens.” Winner of the 2015 PROSE Award for US History.

Heartbeats in the Muck: A Dramatic Look at the History, Sea Life, and Environment
John Waldman tells the story of the animals, water and habitats of NY harbor's past and present, with a surprisingly optimistic look toward the future. Publisher Weekly calls it an "exemplary and compact work of popular ecology."

The Nature of New York: An Environmental History of the Empire State
This comprehensive environmental history of New York State illustrates how NY history links to larger epochs representing stages in humans' evolving understanding of our relationship to nature. Author and Professor Neil Maher writes, "Stradling persuasively illustrates how one cannot fully understand the history of the Empire State without also taking into account the state's intimate relationship to the natural environment" (Cornell Press).

Sustainability in the Global City: Myth and Practice
Ethnographic studies from eleven cities and six continents. Wendy Applequist writes, "The authors approach sustainability as 'discourse' and 'myth,' with case studies from around the world showing that differing definitions have practical implications for both conservation and social justice" (Cambridge University Press).

C. PROJECT FORMAT

In telling the story of the harbor within an immersive, underwater virtual reality environment, we aim to leverage the curiosity and excitement around virtual reality to reach new audiences, and explore the harbor from an uncanny perspective, seen by few humans. Beyond the novelty of emerging technology and immersive underwater environments, VR offers singular possibilities for intellectual and emotional connections. As an interactive medium, VR both grants agency and requires the user to actively investigate and learn. As an engine for nonlinear storytelling, VR invites new and complex ways of understanding. For example, time periods can overlap in a virtual environment, allowing a user to make new connections about how the past informs the present. Similarly, users can navigate places and events through the lens of a particular theme. While it is debatable as to whether or not VR is in fact an "empathy machine," the visceral feeling of being immersed in and interacting with the sights and sounds of an environment allows users to, unlike cinema, actively guide their own unique experience (Alsever, 1). As Kate Nash writes in, "Virtually real: exploring VR documentary," VR documentaries mark a "shift towards the experiential, subjective and embodied" (Nash, 98). VR allows one to temporarily disconnect from their own identity, lived reality and corporeal presence. The complexity of being both "present" and having an "out of body" experience can be profound and suggests that VR can stimulate users to identify with people, places and events in new ways. In translating the story of New York harbor into an interactive and immersive work, we will incorporate these unique possibilities for storytelling, making intellectual and emotional connections through the active audience engagement of VR.

While *Virtual Aquapolis* will offer a linear historical timeline from which the user can trace cause and effect, the user may instead choose to explore in a nonlinear fashion by following narrative threads tied to our humanities themes. This mode of navigation will superimpose the past, present and future, encouraging the user to draw new connections by observing patterns, cycles and systems. Scenes depicting historical events will incorporate a combination of interview, narration and archival materials to establish context. Ultimately, the complex story that unfolds is one of change driven by reciprocity: as human culture, values and activity simultaneously inform

and are informed by the geography and natural ecosystems of the harbor. The following description provides an example of a user-experience in the VR environment.

> *The user puts on the VR helmet to dive into the underwater world of New York City. They explore the harbor as both a fertile hunting and fishing ground for Indigenous communities, and a source of plentiful natural resources for early Dutch settlers. Bluefish chase schools of mullets and evade waves of sediment. Cargo ships above navigate the harbor's perilous channels. As a swelling population encroaches on the city's waterways, the waters push back, breaching ground wells with salt water. A flock of Merganser ducks drift near the shoreline.The city burns with disease and rampant fires. Billows of human waste cast shadows over the harbor floor. From a muffled cacophony of boats, dredges descend scraping across the reefs. Raw sewage coalesces with industrial waste. While some fisherman persist, to most New Yorkers, the harbor is an abyss: a burial ground. Porgies hide in patches of seaweed, among horse bones. As the tide recedes, rubber gloves and aluminum cans are stranded in the spiny grass at the shore. A crab claw floats among shimmering streaks of petroleum. An algae bloom fades from green to brown and disintegrates. A trash barge leaves a foamy wake in murky green waves. Sunlight slowly edges toward the harbor floor. An eel rounds the corner of a discarded washing machine. A ragged dock collapses into the water, the last pylon consumed by shipworms. As the tide rolls in, the harbor convulses against and then over walls and railings, forging new paths over asphalt. As the surge recedes, some waterfront structures transform into empty grass fields, while others are replaced by fortified towers. A humpback whale breaches at the water's surface. A group of scuba divers descend, bringing a new cluster of oysters to a reef. The water begins to clear around the new oyster beds. Heavy rain oscillates on the water's surface.*

The underwater changes in the harbor described in the scenes above will be presented within a larger historical context and interpreted through our humanities themes. Scenes depicting historical events will incorporate a combination of expert interview, narration and archival materials to provide interpretation and context.

Successful models for our approach

While *Virtual Aquapolis* will be unique in its subject and technique of combining archival material, animation, expert interview and 360 underwater photography into one VR documentary experience, we are combining tools and techniques that have been previously utilized in a number of successful projects. Using animation to explore history has been seen in a number of award winning documentaries including: *Tower*, *Chicago 10* and *Waltz with Bashir.* Underwater 360 video is being utilized to document marine environments in VR experiences, for example: Underwater Earth's *Palmyra Atoll* and *Dolphin Encounter on The Great Barrier Reef*. Successful VR documentary shorts that mix animation with narration or interview include: *Notes on Blindness: Into Darkness* and *Grenfell Tower.* Websites with interactive documentary elements are increasingly popular ways to provide background and educational materials to supplement a VR or experimental documentary experience. A great example is *Parliament: The Virtual Experience*. With our digital team, we will draw on the best practices of these and other models as we develop our Design Document.

D. USER GENERATED CONTENT

While any strategies for incorporating user-generated content would be developed through the design process in consultation with our humanities and digital teams, we have a strong background of creating projects that actively engage audiences and incorporate user generated content. For example: Chipley's *Armada* utilized user-created underwater video by allowing users to pilot boats. Smith has created multiple museum installations (Tell-A-Commute and Convergence Lines) that utilized interactive SMS prompts for community photos documenting urban spaces which were then incorporated into the gallery installations. Related to this project, Chipley and Smith, during their 2018 Works on Water Residency on Governors Island, invited visitors to contribute to a short animated film by drawing their vision of NYC's response to raising water levels. The drawings, many of which were created by children, included a wide range of responses, including technical barriers, floating cities and returning the NYC coastline to nature. We anticipate that we might revisit elements of this collective "futures thinking" process in *Virtual Aquapolis*'s teaching guides and website, perhaps including a teaching lesson on "futures thinking" with a curated gallery of user-generated "futures" that augment those depicted in the VR experience reflect the humanities themes present in the project.

E. AUDIENCE AND DISTRIBUTION

Virtual Aquapolis will be designed to both engage and to be accessible to a wide range of people. The project's VR format, unusual perspective, and foundation in humanities research will be of interest to academics, educators and students, as well as audiences drawn to immersive, interactive technology, or who are simply curious about the hidden world under the harbor. The intended presentation of the project, as a series of free public events on Governors Island (~ 800,000 annual visitors); in galleries and museums; schools and colleges; and via mobile-based VR via a free download, has the potential to reach people regardless of whether they frequent museums, attend schools, are local to NYC, or own expensive VR technology.

We have spent over a year building relationships with organizations working on Governors Island and those engaged in public programming about New York Harbor for the express purpose of distributing this project to a diverse audience through free, site-specific public events overlooking the harbor. These organizations include the Billion Oyster Project and Works on Water (See *Community Partners* section below).

In strategizing how to present *Virtual Aquapolis* in museums and galleries, we plan to draw on the relationships we have built through our previous projects. Members of the core team have strong records of exhibiting work both in public spaces and with institutions including: Hammer Museum (~150,000 annual visitors), Museum of the Moving Image (~150,000 annual visitors), New York Transit Museum (~500,000 annual visitors), Queens Museum (~200,000 annual visitors), New York Hall of Science (~500,000 annual visitors) as well as with art galleries and other smaller venues. While we sometimes create commissions, intended from conception to be exhibited at a specific institution, we more often create new projects independently and exhibit the final work in a variety of iterations, both inside and outside of museum/gallery walls, as well as online. For example, our short animated film *Aquapolis 2100,* developed out of a Works On Water residency on Governors Island, was presented in their WOWhouse gallery exhibition, and then went on to be showcased at the Museum of Moving Image and screened internationally at outdoor screenings as part of the Under The Subway Video Art Night.

We also anticipate presenting the final VR experience in educational and scholarly settings in a number of ways: installing it on NYC area campuses by invitation, presenting the project in invited campus talks, and supporting its use in classrooms through free downloads. Additionally, Smith and Chipley regularly present work at documentary conferences--iDocs, Visual Evidence, Skidmore's Storyteller's Institute, Pluralities--and many of these annual conferences solicit installations of VR and interactive documentary work as part of their programmed screenings, while also including academic discussion of emerging media projects in the panel proceedings.

The engagement we foresee as most accessible, with the greatest capacity to reach a large audience, is online distribution. We will distribute this VR experience for both headsets and mobile based VR on our website. Our website will also contain an interactive timeline and select interview clips from our humanities consultants and other experts to provide additional context and interpretation of the material in the immersive VR experience. Once the project is available to download, individual users will be able to experience the project with a VR helmet or low-cost mobile based VR. A robust teaching guide, also available for free on our website, will support discussion and critical engagement when utilizing the download in educational settings. The challenge for this digital mode of distribution lies within informing the public about its availability. Our digital team includes people who can consult on how best to distribute and exhibit a VR project-- for example Liz Canner who has experience distributing a successful virtual reality experience, while Kate Stevenson designed an innovative, interactive VR helmet for gallery installation. Using this team as a resource, we will develop a distribution plan that allows for the most users to experience our virtual underwater journey through the history of New York Harbor.

F. RIGHTS, PERMISSIONS AND LICENSING

Virtual Aquapolis will be covered by Attribution-NonCommercial-NoDerivatives 4.0 International License. All the project materials will be free and available on the *Virtual Aquapolis* website.

G. HUMANITIES ADVISERS

Dr. Peter Alagona, *Associate Professor, History & Environmental Studies, UC, Santa Barbara* is an environmental historian, historian of science, and nature-culture geographer. His work focuses on the histories of conservation and human-wildlife relationships. He holds a PhD in history from UCLA (Postdoctoral fellowships at Harvard and Stanford). ***Project Contribution:*** Alagona's expertise as an historian of science will inform the past and present sections, while his work as a nature-culture geographer will guide us in exploring possible future scenarios.

Erin Becker, *Visitor Services & Volunteer Coordinator, Long Island Maritime Museum.* As a scholar Becker takes a multi-dimensional approach to understanding maritime economies. Erin's research focused on Long Island Native people—specifically how women in the Shinnecock, Montaukett, and Unkechaug nations—participated in the deep-sea whaling industry, fishing industry, and the military. Her work in museums grapples with investing local peoples in their resources as stakeholders through outreach, education, and public programming. She holds an MA in History from Stony Brook. ***Project Contribution:*** Becker's research into maritime economic issues for Indigenous female workers will add an important perspective while her expertise as a public historian, engaging the public around water, ecology and history will inform our public engagement, outreach and sustainability strategies.

Dr. Melissa Checker, *Hagedorn Professor of Urban Studies at Queens College / Anthropology, CUNY Graduate Center,* focuses on environmental justice and urban sustainability in the United States. She is the co-editor of *Sustainability in the Global City: Myth and Practice*. Her book, *Polluted Promises: Environmental Racism and the Search for Justice in a Southern Town* won the 2007 Association for Humanistic Sociology Book Award. She holds a PhD from NYU in Environmental Psychology. ***Project Contribution:*** Drawing on her expertise in urban studies,green economy, social movements and her research on the relationship between environmental activism and sustainable policies New York City, Dr. Checker will be instrumental in elucidating possible future scenarios for NY Harbor.

Dr. Michael Chiarappa, *Associate Professor, History, Quinnipiac University,* is an active public historian and public humanities scholar committed to collaborations between universities/ colleges and the wider community. Dr. Chiarappa's research focuses on marine-related environmental and cultural history and ethnography of the United States. Notable for this project is Dr. Chiarappa's research on NYC's Oyster Barges and his historical writing about Delaware Bay. He holds a PhD in history from the University of Pennsylvania. ***Project Contribution:*** *Dr.* Chiarappa will bring his expertise in NYC's marine world, and its historical development as a port, to the project. His work as a public historian and public humanities scholar will help us translate to a general audience.

Dr. David Soll, *Environmental Studies, University of Wisconsin, Eau Claire,* researches the history of water. His book, *Empire of Water: An Environmental and Political History of the New York Water Supply*, follows the history of the city's water supply. Through this history, Soll reveals larger shifts in environmental philosophy, ethics and practice throughout the twentieth century. He holds a PhD in History from Brandeis University. ***Project Contribution:*** Dr. Soll will help us develop humanities themes around the environmental and political history of the New York Harbor. He will guide us as we map shifts in environmental practices that occurred during the twentieth century. His research will help us chart how New Yorkers' relationship to water intersects with the geography and history of the city.

Dr. Ted Steinberg, *Distinguished Professor of History, Case Western Reserve University,* focuses on the intersection of environmental, social, and legal history. Notable to this project, Dr. Steinberg authored *Gotham Unbound: The Ecological History of Greater New York*, which examines the ecological changes that have made New York the city that it is today. His books have received numerous awards, he has also written for the mainstream press and appeared on numerous radio and television shows. Additionally, his work has been discussed in print by Malcolm Gladwell and others. He holds a PhD in History from Brandeis University (Fellowships include: Guggenheim, NEH and American Council of Learned Societies, Benjamin Zucker Fellow at Yale University). ***Project Contribution:*** Dr. Steinberg will consult on how the ecological history of New York state and NYC relates to the underwater world of New York Harbor, as well as the role of the harbor in the larger political history of the state and city. His work will help us interpret history through an ecological lens and to trace the ways humans have changed the harbor's geography through the centuries.

Dr. David Stradling, *Professor, History, University of Cincinnati,* teaches urban and environmental history and is the author of several books, including *The Nature of New York: An Environmental History of the Empire State* (Cornell University Press, 2010). He has also written about dumping in the New York Bight. His current research focuses on dredging and underwater infrastructure. He serves as co-editor of the *Urban Life, Landscape, and Policy* series at Temple University Press. He holds a PhD in History from University of Wisconsin-Madison. ***Project Contribution:*** Dr. Stradling will help us map the urban and environmental history of New York Harbor. His expertise in dredging will be important as we explore that aspect of the harbor's history. He also brings an overarching understanding of the environmental history of NYS to the project. His research will help us chart and interpret how humans' changing understanding of our relationship to our natural surroundings intersect with the history of NYC and the harbor.

Dr. John A. Strong, *Professor Emeritus, History, Long Island University,* is a noted authority on Long Island-based Native American tribes. In *The Montaukett Indians of Eastern Long Island*, and *The Algonquian Peoples of Long Island From Earliest Times to 1700* he traces the history of these first Long Islanders from the end of the first Ice Age about 10,000 years ago to the beginning of the18th century. In '*We Are Still Here!' The Algonquian Peoples of Long Island Today* he describes the current status of the descendants of these original inhabitants: the Shinnecocks in Southampton and the Unkechaugs at Poospatuck In Mastic, the Montauketts of Montauk and the Matinecocks from the Manhasset area. In his work, Strong explores issues of cultural assimilation, political and social tensions, and patterns of economic dependency. He holds a Ph.D, in American History from Syracuse University. ***Project Contribution:*** Strong's research will help us accurately explore the Indigenous history of the harbor, while his work with current Indigenous residents will help us weave this important perspective throughout the present and future sections.

Dr. John Waldman, Professor of Biology, Queens College, focuses on historical ecology and urban waterways. Before joining Queens College, he worked for 20 years at the Hudson River Foundation for Science and Environmental Research. Central to the project,Waldman wrote *Heartbeats in the Muck: A Dramatic Look at the History, Sea Life.* He holds a PhD in Evolutionary Biology from City University of New York/American Museum of Natural History. ***Project Contribution:*** John Waldman will bring his multidisciplinary approach to ecological history, as well as his expertise in New York waterways and background in biology to the project. He will help us trace the arc of New York Harbor's environmental history from a pristine estuary through industrialization and into today's moment with the return of oysters. This project will greatly benefit from Waldman's ability to tell the underwater story of NY Harbor and to translate this history into a narrative that engages a general audience.

Curtis Zunigha, co-founder and co-director of the Lenape Center, was elected chief of the Delaware Tribe of Indians from 1994–1998. The Delaware are originally known as Lenape in their traditional language and culture. The Lenape Center is a nonprofit based in New York City which promotes the history and culture of the Lenape people (a.k.a. Delaware Indians) through the arts, humanities, and social identity. (www.thelenapecenter.com). As a tradition-bearer of the Lenape culture he has proficiency in language, history, customs, singing and leading Lenape social dances.

H. PROJECT AND DIGITAL MEDIA TEAMS

Project Team
SUNY Old Westbury is the sponsoring organization. The project team of Basawapatna, Chipley and Smith will have full creative control over the project.

Laura Chipley, *Assistant Professor at SUNY Old Westbury, American Studies/ Media,* has created several documentary art projects about NYC waterways, including large scale works engaging the public around history and environmental issues. Her work is often created through interdisciplinary collaboration with environmental scientists, engineers, and community organizers. Her recent projects include *The Newtown Creek Armada*, an interactive boat pond created in a New York Superfund site; *The Appalachian Mountaintop Patrol*, a collaborative, environmental multimedia education initiative that works with West Virginia residents to use emerging technology to chronicle the effects of Mountaintop Removal coal mining; and *Monster in the Closet*, a participatory animated film following oceanographer Hannah Zanowski's (Princeton University) research in the Southern Ocean, commissioned by the New York Hall of Science for *ACCESS: Artist and Scientist Collaborations*. Chipley's work has been exhibited internationally and featured in multiple publications and television segments including *The New Yorker*, *Wall Street Journal*, *Wired Magazine* and *Vice News Tonight.* Chipley has received grants from Art Matters, the Hudson River Foundation, the Brooklyn Arts Council and the Macktez Summer Stipend program and in 2015, she was awarded an A Blade of Grass Fellowship for Socially Engaged Art, and was selected as an "*Art and Social Justice Working Group Artist Respondent*" by the Vera List Center for Art and Politics. Chipley has successfully worked in partnership with organizations and institutions both large and small including: Department of Environmental Protection, New York Hall of Science, NYU Tandon School of Engineering Dynamical Systems Lab, Public Laboratory for Open Technology and Science, Metropolitan Waterfront Alliance, Gowanus Dredgers, North Brooklyn Boat Club, Newtown Creek Alliance, Billion Oyster Project, North Brooklyn Public Art Coalition, Coal River Mountain Watch, Mother Jones Community Foundation, and Kanawha Forest Coalition. Chipley is a founding co-director of the Media Innovation Center at SUNY Old Westbury. She holds an *MFA in Integrated Media Arts from Hunter College.* ***Project Contribution:*** Drawing on her documentary, underwater photography and animation experience, Chipley will oversee the development of a visually immersive, narrative VR experience. She will also draw on her experience working with scientists and academics to translate academic research into projects that engage the public. For the Design Document, she will author the User-Experience Section (working with the media consultants) and second-author of the Narrative Section.

Samara Smith, *Associate Professor at SUNY Old Westbury, American Studies/ Media,* produces digital humanities and mobile documentary projects. She often works with institutions to create participatory projects for public engagement outside the museum or gallery walls. Much of her work is set in and about urban public spaces. Recent projects include: *On Hamburger Square*, an augmented reality tour exploring civil war and civil rights monuments in Greensboro, NC's 1st town square (commissioned by Elsewhere Museum as part of their South Elm Projects. Funded by ArtPlace America) and *Central Park: Democratic Playground*, a GPS triggered multimedia smartphone app tour exploring the history of Central Park narrated by former Commissioner of Parks Adrian Benepe (produced for the startup company Detour). She has a record of successful collaborations with museums and other institutions, including: Hammer Museum, Elsewhere Museum, Billion Oyster Project, New York Transit Museum,

Queens Museum. Her projects utilize a variety of emerging media tools, including augmented reality, GPS triggered apps and interactive SMS. Prior to becoming a professor, Smith worked as a documentary editor and post-production supervisor, including years working with Ric Burns on his 17-hour film, *New York: A Documentary Film*. Smith is a founding co-director of the Media Innovation Center at SUNY Old Westbury. She holds an *MFA in Integrated Media Arts from Hunter College.* ***Project Contribution:*** Smith will work with the humanities consultants to further develop the humanities themes and history timeline and with the full team to design the user experience. Drawing on her documentary post-producing experience, she will also serve as project manager, overseeing budget and work plan. For the Design Document, she will be the head author of the Narrative Summary (working with the humanities consultants) and second-author of the User-Experience Section.

Dr. Ashok Basawapatna, *Assistant Professor, SUNY Old Westbury, Computer Science,* researches Human Computer Interaction and focuses on engaging end-users, including motivating underrepresented populations in computer science, using a project first based approach to computational thinking. His research focuses on end-user programming tools including accessible low threshold-high ceiling cyber learning environments. More recently, his research has focused on enabling student creation of virtual environments and closing the cyber learning loop through assessment via retention in online educational programming environments. This virtual reality research is a continuation of his Master's thesis research in the Media Arts department at UC Santa Barbara and as a virtual reality developer at USC's Institute for Creative Technologies. Furthermore, he has developed multiple frameworks aimed at maximizing education and engagement in cyberlearning environments, and has created theories of maximizing end-user retention and mentored Collegiate Science and Technology Entry Program Research students in creating and programming virtual environments. He holds a PhD in Computer Science from University of Colorado Boulder. ***Project Contribution:*** Basawapatna's main roles on *Virtual Aquapolis* include: user-experience design, testing and feedback strategies, technical troubleshooting and overseeing the site architecture of the website design. For the Design Document, Basawapatna will be the head author of the technical specifications and sustainability plan sections (working with the digital team).

Digital Media Team

Liz Canner is an award-winning filmmaker, digital artist and writer who creates films, cross-platform digital media projects, and installations. She often employs cutting-edge technologies to explore human rights and environmental issues. She is the producer/director of *The Lost City of Mer*, a cross-platform interactive experience combining a smartphone app with virtual reality. The app enables the user to win rewards in the virtual world by cutting carbon emissions in the real world. Her work has played at more than 100 film festivals internationally, been theatrically released, broadcast on TV globally, and streamed in 41 countries. She has received over 60 awards, and grants for her work including an NEA grant, the Dartmouth College Visionary Award and fellowships from the Rockefeller Foundation and the Radcliffe Institute for Advanced Study at Harvard University. ***Project Contribution:*** Canner will consult on the development of the story narrative, user-experience and technical specifications. Her expertise in emerging technologies and distribution will be particularly helpful as we develop a successful VR user-experience and write our distribution and sustainability plans.

Jeremy Dennis is an artist and tribal member of the Shinnecock Indian Nation in Southampton, NY. His work explores Indigenous identity, culture, and assimilation. Using digital photography, he creates images that reference the most common depictions of Indigenous people "to create conversations about uncomfortable themes of postcolonialism." His project, *On This Site*, uses photography and an interactive online map to showcase culturally significant Native American sites. Dennis gathers and combines archaeological, anthropological, historical, and oral stories to answer essential cultural defining questions: Where did my ancestors live? Why did they choose these places? What happened to them over time? Do these places still exist? Dennis was awarded a 2016 Dreamstarter Grant from Running Strong for American Indian Youth. ***Project Contribution:*** Dennis will bring expertise in local Indigenous history and present day culture to the project. His collaborative interdisciplinary research methods will inform our process for incorporating Indigenous perspectives and voices throughout the past, present and future sections of *Virtual Aquapolis*.

Robin Espinola is a documentary producer and writer with over twenty-five years of experience creating historical programs for PBS. In 2019, she was awarded the Eric Barnouw Prize from the Organization of Historians for her work producing and co-writing *The Chinese Exclusion Act* with Ric Burns and Li-Shin Yu. She has served as a producer for numerous other NEH-supported projects including: *The Pilgrims*, *Death and the Civil War*, and *Into the Deep: America, Whaling & The World* (all directed by Ric Burns). With Burns, she produced *Nueva York*, a film for museum exhibition which was created in consultation with El Museo del Barrio and the New-York Historical Association. Espinola served as series archivist for Burns's epic documentary series *NEW YORK: A Documentary Film*. ***Project Contribution:*** Espinola will draw on her extensive producing experience to consult on the project timeline and budgeting. Her extensive experience with archival research, licensing and fact checking will be vital to the project. Additionally, her extensive experience in historical documentary will help us develop the humanities themes and historical timeline.

Dominika Ksel is currently working on a project for Reclaim Pride about the History of the Christopher Street Piers that entails 360 Video, AR and holographic projections. She produced a VR project about Myth, Media, Climate Change and Antarctic and another for Montefiore Hospital, currently featured on the Center For the Humanities website. She also teaches a New Media class exploring Urban Climate Justice through VR/AR and 360 video at City Tech. ***Project Contribution:*** Drawing on her innovative VR documentary experience, Ksel will consult on the technical and creative elements of the VR documentary and on the distribution plan.

Kate Stevenson is the founder of DotDot an award-winning creative studio focused on generating impact through social and immersive experiences. Exploring the boundaries of technology, art and design, DotDot creates experiences that are memorable, playful, and interactive. DotDot services include: Creative Collaboration (developing creative direction and content that is experience and story driven); R&D Lab (rapid prototyping and experimentation, building custom tools, using technology to solve problems, tell stories and bring people together); and Creative Tech Production **(**delivering creative technology solutions with an understanding of sustainability). Recently, Kate and DotDot Studios created *SoundLab*, a virtual reality installation for gallery exhibition where sounds are given 3D visual form and can be played with just hands. Suspended from the ceiling, the installation is designed to be exhibited without the need for a host to oversee operations. The headset includes an infrared camera to track the users' hands, and speakers to experience the music they are creating. The rig also

includes a projector and speakers for other gallery visitors to see and hear what the person inside the headset is doing. ***Project Contribution:*** Drawing on her extensive technical, installation, user-experience and VR experience, Kate will consult on the technical specifications of the VR project, installation design, the user-experiences and the sustainability plan.

Community Partners

The Billion Oyster Project (BOP) is an environmental remediation and education initiative that is working to restore one billion oysters in New York and harbor while engaging the community in the stewardship of local ecosystems. **Madeline Wachtel,** deputy director, will consult on this project. BOP's hands-on science of reef construction and monitoring is executed through community oyster reefs, in-school restoration-based STEM learning opportunities, volunteer programs, community science and research, and restaurant shell collection. New York Harbor School, a maritime high-school located on Governors Island, is the flagship school of the BOP, and its students contribute to BOP as part of their Career and Technical Education (CTE) experience—growing oysters, designing and building oyster reef structures, diving to monitor reefs, operating boats, performing marine biology research, and more. BOP has engaged ten thousand volunteers, over six thousand public school students, one hundred local schools and works with seventy-five local restaurant partners. ***Project Contribution:*** For the discovery phase of the project, we will consult with Madeline Wachtel to identify strategies for underwater photography and installation/audience engagement on Governors Island.

Works on Water is an artist-run organization that supports artworks, performances, conversations, workshops and site-specific experiences that explore a wide range of creative approaches to exploring the significance of water in the urban environment. Works on Water supports artists and engages with the community in a variety of ways: through summer artist residencies on Governors Island, a triennial exhibition and a wide variety of public programming. ***Project Contribution:*** For this phase of the project, Works on Water will not send a consultant to meetings but will provide brief written feedback on user experience, as it pertains to public space presentations and exhibitions of the project on Governors Island. They will be more involved in the production phase, as we finalize installation and public engagement strategies.

I. STATE OF THE PROJECT

Last summer the core team was awarded a *Works on Water* residency on Governors Island to explore 360 degree underwater filmmaking of the Harbor. We worked with the Billion Oyster Project and the Harbor School on Governors Island documenting their underwater restoration efforts. Additionally, we researched VR technology and experimented with filming techniques for optimal presentation of underwater 360 degree video in a VR headset. We also experimented with techniques for underwater filming. Some of this footage was filmed by student divers as part of our partnership with BOP/The Harbor School. We created a five-minute underwater work-in-progress VR video, which was exhibited in the Works on Water open studios event in October. The more ambitious and developed project presented in this proposal was born out of this early experimentation, site-research, and collaboration.

Over the past year, we have worked to expand the technical and thematic scope of the project. This work includes extensive research on New York harbor and VR technology and techniques. Our initial experiments and research led to assembling the *Virtual Aquapolis* humanities and

digital consultant teams. We have also successfully gained support for the project from the SUNY Old Westbury college administration. If awarded this Discovery Grant, we are well situated to successfully complete the Design Document within our projected timeline.

J. ORGANIZATION PROFILE

SUNY Old Westbury was founded in 1965 as a small, public liberal arts campus that would draw diverse students and faculty together. Ranked as one of the most diverse schools in the nation, our mission includes community engagement, critical thinking, empathy, creativity, cultural understanding, and building a more just and sustainable world. This project is well aligned with our organization's mission. The resources we will use from our school include a state of the art virtual reality lab, TV and video production studios, as well as a new emerging media studio (anticipated completion spring 2021) funded by a $1.125M award from NY State, based on a Diversity in Tech proposal authored by core team members. The campus Media Innovation Center will provide meeting spaces, as well as user-testing opportunities. The diversity of our student body will allow for effective playtesting of the created VR environment. Furthermore, the campus Amelie A. Wallace Gallery provides a location for an initial soft rollout of *Virtual Aquapolis* as a gallery installation. This will be more relevant as we proceed past the Discovery phase of the project to the prototyping and user-feedback stages.

K. FUNDRAISING PLAN

Thus far we have raised $3,000 from a United University Professions Individual Development Award Grant, which funded our 2019 experiments with underwater 360-degree video. For this Discovery phase we do not foresee costs exceeding NEH support. Should we need additional funding, we will apply for a combination of United University Professions Individual Development Award Grants ($3,000), United University Professions Professional Development Grant (up to $15,000), and internal SUNY Old Westbury Faculty Development Grants ($5,000). A robust fundraising plan for the production phase of the project will be included in the Design Document.

L. PROJECT EVALUATION

To evaluate the potential appeal and efficacy of the content and platform outlined in our Design document, we will provide a rubric for our consultants to complete, in addition to their in-text written feedback on the design document. The rubric will include ratings for the weight, complexity and clarity of the history, humanities themes and interpretive content, as well as overall ratings of the narrative structure, user experience, audience engagement and technological sustainability plans. In addition, we will create wireframes for a “cognitive walkthrough” of the project and invite student volunteers to evaluate the experience utilizing these wireframes (Lewis, 717).