(FORE)CASTING THE PRESENT AS THE FUTURE

Environment Design for the Environmental Game Aquanesia

KIMBERLY LONG LOKEN

Mega-game. The very name of the genre suggests the epic. Leaving the confined dimensions and controlled lighting of a soundstage, a theatre, or an escape room, immersion in the magic circle of the game world is an ever-larger challenge for designers to fulfill audience expectations for immersive experiences.

Aquanesia (2018) is a location-based game and performance set 100 years in the future in which players test their skills at different watershed-based activities to decipher a set of clues, which will help them unlock the mystery of how and why people are losing their memories of the past century.

The goal of *Aquanesia* is to create a fun-filled adventure that gets people outside to play and connect with their city and local watershed on bicycle or on foot. During the process of solving the game, they become familiar with specific aspects of the local environment as well as general principles about a watershed and clean water. The intended result of the game is that players are encouraged to become ever-better stewards of their watershed.

Written by the game's mechanics and scenic designer, Kimberly Long Loken, this post-mortem will examine the interplay of narrative, game mechanics, visual design and fabrication,

production management and environmental science in the development of *Aquanesia*.

A SERIES OF PLAYABLE THEATERS

In small teams with pre-registered start times, several hundred people can play Aquanesia over the course of a weekend, with each team's experience taking 2-3 hours (not unlike a round of golf). The target audience is casual players, inclusive of school-age children; prior knowledge of watershed issues is not needed. It is a prosocial, cooperative experience. Registration is interwoven with prologue, after which players choose-their-own-adventure. Strategically sited in park- and water- adjacent civic locations, every station is anchored by a costumed actor whose lines reveal narrative and facilitate gameplay activities, each in service of sharing watershed knowledge. Each station is a 10-minute scene structured around: a call to action, an inclusive physical activity, and an incremental win (physically, a clue; conceptually, more narrative and more knowledge). Among these incremental wins, one character reveals the secret location at which the game actually ends – a station just out of sightline from the starting area wherein game narrative and watershed knowledge are synthesized. Thus, players are equipped to translate knowledge gained from this cautionary tale into real "wins" for their community.

Location	Check In (pre-game)	Citizen Cleanup Brigade HQ	School Science Lab	Sinking Dock	Fish Rapids	Water Reserve	Sunset Sands	BestWay Plant	City Hall	People's Basin	The Source (post-game)
Watershed Issue	n/a	Flooding Human Health	Emerging contaminants	Eutrophication	Invasive Species	Infrastructure; privatization, maintenance	Erosion	Pollutants	Permeability	Stewardship	n/a
Character	n/a	Cleanup Captain	Science Teacher	Taxi Boat Driver	Carp Hunter	H2Ope Activist	Beachcomber	Spill Monitor	Intern	Librarian	n/a
Activity	Pre-Survey Waiver AQ Test	Prep for mission; collect water sample	Use centrifuge to separate particles in water sample	Clean up	Catch as many as you can	Siphon water	Goal-tend to stop the runoff	Try to mitigate cascading failure	Land Use puzzle and conversation	Discuss clues Deposit vials Build aquifer	Reflection Post-Survey Education
Earn	Code Name	Protective Gear	Vial: Unidentified contaminant	Vial: Algae	Vial: Compost	Vial: Clean Water	Vial: Sand	Vial: Hazardous Waste	Vial: Gravel	Healthy Watershed	

Image 1: Summary matrix of watershed issues and game stations/scenes.

THE INVITATION TO PLAY

The story, and the immersion, begin with this text on event advertising and web registration:

> Years into the future, the city is hot, humid, and stormy. Temperatures have risen – and so have the flood waters. Public infrastructure has been overwhelmed by storms, which are frequent and extreme. Water, while abundant, is often not clean enough to drink or swim in. Despite all of this (or perhaps because of it) the city residents remain active and optimistic. With disaster as their common bond, they rise to the challenge of keeping their cherished city above water. Lately, however, residents have been having trouble with their memory. After each storm, murmurs of "aquanesia" circulate as more folks seem dazed, disoriented, and forgetful. What is this mysterious aquanesia? Can you find a cure before you, too, forget?

Players are cast as their best selves: citizen volunteers helping to clean up after a hundred-year flood (which now come at a rate of every 87.3 days). After acing an "AQ" test (the fun form that accompanies other registration protocols), your team is identified for a special mission: collecting samples, stories and experiences that function as clues for restoring the watershed – and, in turn, human – health.

Actors tell stories that integrate gameplay at each station; the players use a map to choose the order of their investigation and travel to each station, usually by bicycle.

The players join the cast by "suiting up": SPF300 sunscreen (face paint), bandoliers, ankle bands, and code name badges for their mission. What might seem like flair and swag is, in fact, multi-functioning.

- Conceptually, they have entered Huizinga's magic circle.
- Pragmatically, they are displaying a proof-of-payment/ registration that is highly visible to both actors and crew

dispersed at other stations and to the general public who are occupying the same civic space.

- Educationally, their code names allow our team to match pre- and post-game surveys while protecting players' privacy.
- Narratively, they can be engaged by the actors: "pssst… Red Pine… over here… I need your help."
- Functionally, they are wearing – and keeping as swag – additional bicycle safety gear. (And their own bike helmets will be referenced as hard hats several times in the script).

Image 2: Players "suit up" for protection against flood waters and the illness they may carry. Photos by the author.

Sample Scene: The Sinking Dock

Character: Water Taxi Driver

Premise: Players encounter character next to boat (named the Pearly Muscle) on waterfront.

Personality: Clever and opportunistic with a touch of melodrama, a little sleazy in an endearing way.

Pre-activity

Excuse me! Yes, you! I couldn't help but notice you getting off those bicycles over there – so sorry. It must be so difficult to ride one of those rusty things after a storm like yesterday's! So many flooded roadways, not to mention all the mud – must be nearly impossible to peddle, am I right?

Tell you what – I'll give you a little break. Just hop into my water taxi and let me do the work for you!

Gesture two Players into boat

In today's climate chaos, water taxi is the most reliable transportation in town. Storms can't stop us – they only create better shortcuts! *(Laughs)* Take a look for yourself – my luxury vessel – *The Pearly Muscle* – is 100% shaded with fully enclosed monster-squito netting – if you get a bite the next ride is on me!

(*Looking at codename badge)* Wait… are you with the Citizen Clean Up Brigade? I don't know how a small business owner like myself would survive without your selfless efforts! There are so many challenges out here… and now with (*whispers)* *aquanesia*… I can hardly even remember where I'm going!

Say… do you have a spare moment to do me a favor? You see, after the storm there's even more of this long, slimy green… stuff in the water. I don't know… or remember… what it is… but it's sure making it harder to row! Can you help me by getting all of the green stuff out of the water? *(To Players in boat)* Here, I'll even lend you my own paddles!

Hands each Player in boat a paddle.

(*To Players onshore)* And you onshore can help with these useful tools.

Hands one player a green rake, 1-2 others garbage bags.

Alright, go for it! But please, in all your heroics, make sure that

you don't touch the green stuff! It's very toxic and I still don't have liability insurance!

Activity

Players commence with an activity similar to a large and wobbly game of pickup sticks.

Post-activity

Thank you, what marvelous public servants!

I remember what the green stuff is now! It's algae. Been here since before I was taxi-ing. Years ago, when I was first learning how to drive *Pearly*, I paddled out onto the water and saw thousands of fish floating on the surface – dead! I didn't know what had killed them, thought maybe there'd been a spill up at the BestWay Industries plant – no offense to BestWay! Maybe it's something else from uphill instead?

Gazes at set dressing of residential and agricultural fertilizer bags.

But it occurs to me now it could have also been this stuff – algae – choking the oxygen out of the water and making it impossible for those poor fish to breath. Shame too, because it wasn't all zebra mussels and carp back then — still had native species like bass, sturgeon, walleye. Didn't see anyone fishing on the river after that.

Here, as a token of my deep appreciation I'll offer you a discount your next ride – a whopping 5% off! I don't have a coupon, but here, just flash me this.

Hands vial of algae to Player.

Thanks again for the favor – come back for a ride anytime!

RULES FOR DESIGN

"Red herrings set up players with an expectation of a reward that does not pay off. Players feel tricked, and often see this type of gameplay as unfair or wasteful," says Mark Larson, a puzzle and escape room designer. Mega-games and alternate reality games must further mind the clarity of their constructs. Ideally, any

given object in *Aquanesia* is: gameplay logical, aesthetically cohesive, narratively significant, lightweight, durable, modular, and affordable to maintain or replace with ease. *Aquanesia* also requires accurate and accessible science. With sandbox navigation, the siting and spacing of playable theatre stations must also minimize waiting time and maximize suspense before activities.

Visual design and narrative work together to establish the setting: a flooded, overheated, plastic- and mold- saturated, health-compromised future version of the actual community in which the game is being played.

Functionally, we were inspired by Brenda Romero's *The Mechanic is the Message* (2008 – present) series. In *Aquanesia*, every activity demonstrates the movement of water, showing both problems and solutions. Touching water in the gameplay, or siting the activity adjacent to water, reinforce the mechanics.

Image 3: Water's presence in the game: siphoning clean, privatized water (left) and an always-unsuccessful attempt to mitigate cascading failure (right). Photos by the author.

THE ENVIRONMENT

Designing for play in, and at the scale of, a watershed, begged the question: wet or dry? The cinematic imagination quickly travels to dystopian extremes – *Waterworld* (1995) or *Mad Max: Fury Road* (2015). But how could we set dress, or reconcile, an expansive, verdant Midwestern park into ruins?

We didn't.

Instead, our team chose to amplify the parallels between the present and a possible future. Hemlines and technology may shift frequently, but 1920, 2020 and 2120 are likely to have more in common than not; we will still be spending more time on Main Street than Mars. As such, the game takes place exactly 100 years in the future from the date on which it is played, in precisely the same location. The players are not time-travelers; they are effectively living the future of their own grandchildren.

The conceptual affordance of an Every Town neatly supports the modular design requirements of this meant-to-travel game. First staged in Grand Rapids, MN (gateway to wilderness recreation, population 11,222) and Rochester, MN (destination medical center, population 116,961) in 2018, the riverside parks and civic centers in both locations presented coincident settings for the school, library, water tower and other stations of the game.

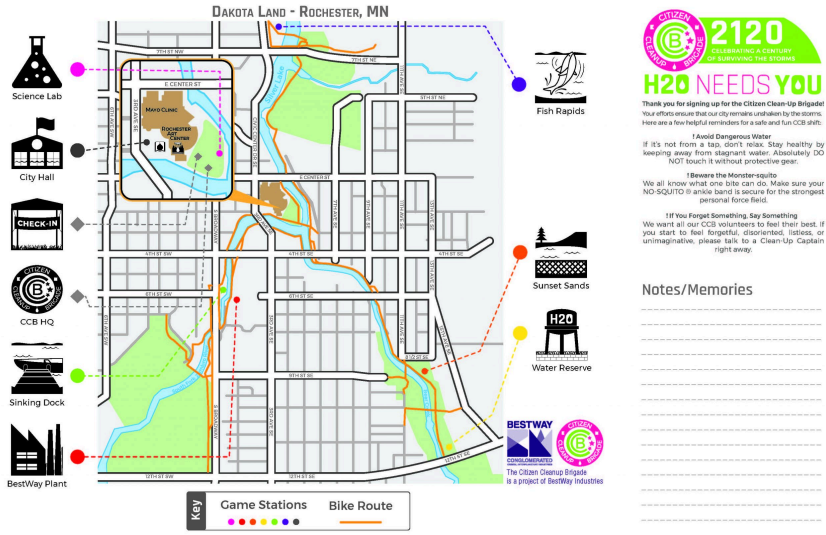

Image 4: Map of Rochester game course. Graphic design by Donald Thomas.

Further, their locations on the Mississippi River and Zumbro River, respectively, provided a variety of natural and man-made conditions by which to site relevant game stations exploring water and watershed issues such as erosion, eutrophication, invasive species/ecosystem services, infrastructure maintenance and privatization, cascading failure, and emerging contaminants.

Image 5: The Beach Comber's station is always sited by the water's edge (left). The Spill Monitor's station is enhanced by an industrial setting (right). Photos by the author.

Casting the player as a volunteer in their own present/future community also leverages the Moral Obligation Model of Environmental Behavior (Davenport et al., 2011), which builds upon previous research to assert that environmental issues can be framed as moral issues; larger than self-interest, the moral obligation increases the likelihood of a subsequent [positive] behavior.

MULTI-FUNCTIONAL

Just as the light costuming of players serves many functions, the scenic elements must also satisfy multiple criteria. Simple flood markers are spaced prior to arrival at each station. They clearly communicate both story and science, are as cheap and easy to lift or plant as a yard sign, and act as the "lobby" for each station/tent/theater. Players advance past the dangerously high invisible flood waters only when invited by the actor, thus remaining out of earshot (and ideally, sightline) for their next activity. Measurement motifs also appear throughout the game in Nalgene bottles as props, illustrated mold stains on backdrops and in the many operable gauges players are tasked with at the BestWay plant.

Image 6: A player approaches the BestWay plant. Photo by the author.

Logically, but sadly, plastic is prominent in the game as it, too, satisfies many production considerations. A future choked with plastic is a dystopic condition that we will see in far too many climates and locations, wet or dry. But we upcycled the materials for many of our game components, thus both practicing and suggesting a maker ethos that characters of our fictional future might engage in. Plastic also satisfies the durable and lightweight production requirements.

Housing each station with a 10×10 folding canopy tent not only enhanced player navigation, but also acted a bit like a black box theatre – concentrating the fiction to a small area with a costumed actor, key props, game equipment and relevant set dressing. An illustrated backdrop affirms the location, orients the stage, and provides a bit of a storage area on the opposite side. Beyond, Mother Nature plays herself.

The compressed space gave us latitude in manipulating the scale

of game equipment and exaggerating the characters and their dialog; the goofiness appeals to our younger players and sidesteps finger-wagging at older players. For example: particles of eroding sand and dirt are realized in a cascade of bouncing kickballs that players must prevent from entering the (close, but not too close) real-life river. The character at this station is a doddering, orange-plastic-poncho-clad beachcomber collecting orange plastic treasures who solicits your help in fighting erosion with dust pans and flimsy orange plastic snow fencing. Their aquanesia is so severe that they have forgotten how the roots of a forest and a wetland could do this job naturally; they have also forgotten their own job – we soon learn that they are the missing Mayor.

Image 7: Orange unifies the costumes, props, scenery, and clues at the eroding beaches of Sunset Sands. Photos by the author.

Giving each station a key color was another exaggeration, but also an easy method for instant visual cohesion among scenery, props, costume, and the takeaway clue (sample vial) earned at

each station. And it helps to keep the game organized for packing and unpacking. (While this effect may be muted for color-blind players, it does not reduce usability of the vials, which are labeled and have visually distinct samples within – see image 1.3.)

WHICH FUTURE?

It would have been fascinating to design far-future tech, but the cost, detail, maintenance, and narrative-specificity of those items are best realized in cinema, or among the most devoted of LARPers. LARPing may build on a collective knowledge of a genre, but interactive theatre needs to invite, host, and continuously engage novel audiences. The experience should be complex, but not complicated, for both players and producers.

Novel technology in the story-world of the game could have worked against our thesis. In much speculative fiction, the more distant the future, the more omnipotent the technology – we do not want our players to abdicate their own critical, present responsibility. Far-future concepts, lingo, and objects were also likely to require more contextual monologue from actors, taking time away from learning-by-playing. Prop and costume maintenance over time would likely suffer, too.

Think of the simple staging of George and Emily on ladders in *Our Town*. Or that Viola Spolin referred to her improv exercises and techniques as theater games. A familiar context and the power of suggestion, delivered with a charming script, eye-to-eye contact, and cooperative challenges, allowed the designers, actors, and players to easily make and accept the invitation to play. Theater, like a tabletop game, assumes that when it says, "let's pretend", you will say "yes".

And when you say yes, it becomes personal.

CASTING THE PLAYERS

In *The Political Brain* (2005), Drew Westen argues that "in politics,

when reason and emotion collide, emotion invariably wins". Our producers wanted to create a persuasive, emotional experience – a game – for climate action. Our watershed partners wanted a less-didactic way of engaging the public. By building the story around an illness, Elle Thoni's script explores the connections between human health and environmental health, leveraging both selfish fears and selfless actions for the greater good. By setting the game in a future near-enough that our grandchildren will live in it also raises the stakes. We can be both emotionally and factually persuaded to do right by them.

Codename Red Pine and the other players agree.

By partnering with local watershed groups and local arts groups, as well as advertising through posters and community press, a large and diverse audience was sought. A $10 pre-registration per team was useful for event logistics, but surely created a barrier to some participants. Alternative funding or reservation systems should be explored; public school partnerships are an opportunity for equitable engagement. While groups of adult friends and families with elementary school age children were common among our 2018 players, the game is designed for a broad and casual audience who may have no previous experience with immersive theater, alternate reality games or watershed issues.

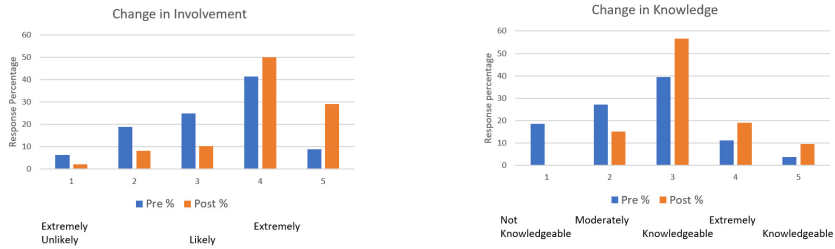

Image 8: The two figures show how participants involvement and knowledge increased after playing Aquanesia. The vertical axis on the graph represents the percentage level of respondents at each point of the scale for the item in question (1-5 on the horizontal axis). Analysis by Jhon Wlaschin.

Social psychologist Jhon Wlaschin, an adjunct professor at the University of St. Thomas, developed pre- and post- surveys of *Aquanesia* players.

An excerpt from his analysis:

> These results show that playing *Aquanesia* appeared to have the greatest impact on boosting participants' knowledge about their local watershed and increasing their likelihood that they would get involved with cleaning up the creeks and streams in their community. Before participating in the game, only a small proportion of participants (15%) reported possessing more than a moderate amount of knowledge about their local watershed. After playing the game, knowledge about watersheds increased 33% overall with 57% of participants reporting they were moderately knowledgeable. 30% felt they had above average knowledge after playing *Aquanesia*.
>
> Similar positive shifts occurred with intentions to get involved in cleaning up watersheds. Prior to playing *Aquanesia*, half the respondents reported that they had not intended to participate in any watershed clean-up activities in the past (reporting 3 or lower on the response scale). After playing the game, willingness to participate in future watershed clean-up activities increased substantially, 29% overall, resulting in nearly 80% of participants

claiming that they were either somewhat likely or extremely likely to get involved.

Given that playing *Aquanesia* seemed to increase participants' general knowledge about watersheds and perhaps motivate them to take part in keeping their local watersheds clean, it also was not surprising that our post-game survey revealed a significant increase in their willingness to discuss this issue with others. Playing *Aquanesia* likely increased general awareness about an important topic that many had not given much consideration in the past. Playing *Aquanesia* provided participants with meaningful concepts and consequences to consider that could be shared with others. These three variables – involvement, knowledge, and public discussion – were, on average, at the low- to mid-range of the response scale prior to playing the game and therefore represented greater potential for increases at the post test assessment.

No red herrings here. But with our players' present and future work, perhaps a reversal in the second decline of Lake Superior herring? After all, we can cast ourselves as the best version of ourselves in more than theater and games.

POSTSCRIPT

Aquanesia went on hiatus during the pandemic but is now exploring partnerships with upper Midwest watershed districts, health organizations, community theaters and schools/universities. The script, props and costumes can also be rented akin to traditional theatrical licensing.

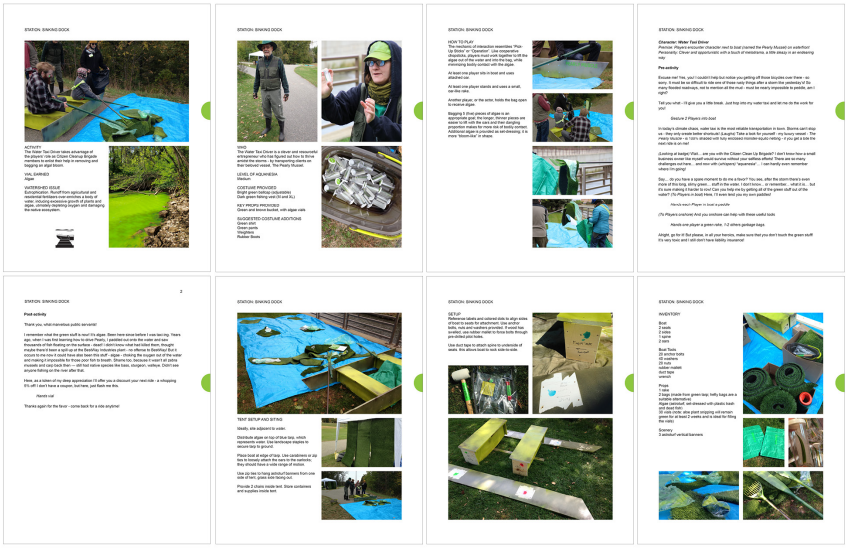

Image 9: Playbook pages related to the Sinking Dock scene.

An illustration-heavy playbook supports continued deployment of the game – inventory, setup and re-packaging instruction, script, etc. Initial video documentation took care not to interfere with player experience, but further instructional video content would enhance the playbook, enticing and empowering future partners or licensees. Similarly, the creative team would like to observe a crew running the experience as if on their own, to further identify any gaps in instruction. While any community partner enhances the potential reach and impact of the game, a local theatre partner is strongly recommended. The script is short enough to be memorized (or referenced from an in-game clipboard prop) by any exuberant person, but the plucky attitude and general production knowledge afforded by community theatre cast and crew are invaluable.

The *Aquanesia* design team took care that the essential structure easily fits many ecosystems and civic locations, but further

localization is possible within its modular design approach. Similarly, layering of additional content is made ever easier with smart phones: schematics for geo-caching, augmented reality viewfinder moments, and poetic audio interludes were considered and remain enticing. Ultimately, focusing on physical logistics only – playable theatre – best served the conceptual and emotional goals of the game.

BIO

Kimberly Long Loken is an assistant professor of Game Design and Development-Art at the University of Wisconsin-Stout. She is also a licensed architect and a Leadership in Energy and Environmental Design (LEED) accredited professional.

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CITATIONS

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