ShakeOut at OMSI 2025

Cascadia 9.0 Videogame as a museum attraction

December 2025

Prepared by Scott Randol

OMSI Engagement Research and Advancement

With support from USGS ShakeAlert and the ShakeAlert EPIcenter Partnership

and in cooperation with Lewis and Clark College

OMSI Oregon Museum of Science and Industry

epicenter PARTNERSHIP

Lewis & Clark

Overview

This report describes the implementation of the Cascadia 9.0 videogame as an attraction on the museum floor at OMSI. As part of ShakeOut 2025 (see ShakeOut.org) activities at the Oregon Museum of Science and Industry (OMSI). This earthquake preparedness game was available to general visitors and a brief investigation was conducted to explore how visitor engagement with the game varied in different contexts and locations within the museum. Specifically, the team was interested in whether visitors played individually or in a group, how long they stayed, how far they progressed in the game, and to the extent to which playing influenced their plans for earthquake preparation and/or intended protective action during an earthquake.

Rationale

Cascadia 9.0 is one of three browser-based videogames designed and developed by an interdisciplinary team of programmers, geologists, media scholars, and psychologists at Lewis and Clark College in Portland, Oregon. The Cascadia 9 game series (Cascadia 9.0, 9.1, and 9.2) were developed as part of an ongoing research effort to understand what motivates young adults to prepare for earthquakes and other natural disasters. Prior research shows that the games can help support young adults in earthquake preparedness by putting information in an engaging context. Data shows that the game engaged users and stimulated short-term learning, information-seeking, and self-confidence in ability to cope with challenges they would face during and after an earthquake (Nilsen et al. 2020; Safran et al. 2024). Specifically, players showed immediate increases in self-efficacy around obtaining clean water and managing bodily waste.

In an effort to explore how people use the game in a natural setting and the viability of using the game as a short-term, unfacilitated museum experience, the OMSI ShakeAlert® EPIcenter co-facilitators (ShakeAlert® EPIcenter Partnership – ShakeAlert[1]) collaborated with EPIcenter partners, Elizabeth Safran, Associate Professor of Geological Science, and Peter Drake, Chair of the Department of Computer Science, from Lewis and Clark College to bring the game to OMSI's exhibit floor.

The effort was also meant to serve as a model for other free choice learning environments to inform their implementation of the game at their institution.

Setting and Context

The Cascadia 9.0 game was available to OMSI visitors on two occasions: August 27, 2025 at OMSI After Dark, and on October 18, 2025, the Saturday after the Great ShakeOut.

[1] https://www.shakealert.org/education-and-outreach/epicenter/

OMSI After Dark (OAD) is an after hours event for guests 21 and over. The theme for the evening was Survival Guide! A Disaster Preparedness Night at the Museum and featured many emergency preparedness vendors and presenters. Four computers were set up near OMSI's cafe. Two of the stations had the Cascadia 9.2 game, one had 9.1, and one had 9.0. This arrangement was selected to maximize the number of people who could play at once (six as 9.2 has a two-player option) while offering all three games. Handheld controllers were available at the stations with Cascadia 9.2. Drs. Safran and Drake were present to facilitate if needed and to make casual observations about visitor engagement. Formal observations were not conducted at the OAD event.

On October 18, two computers were set up with Cascadia 9.0 in each of three locations within the museum between 11 am and 3 pm. The three locations were intended to create different contexts for playing the game: stand alone exhibit, exhibit with enrichments, and teen learning space. The stand alone context was a table in OMSI's Turbine Hall, near the Epicenter shakehouse and other earthquake related exhibits. In the Turbine Hall location, the game was placed with thematically similar exhibits. The Enrichments context included four tables near the Welcome Wall adjacent to OMSI's lobby. In addition to a table with two computers with Cascadia 9.0, there were two tables with earthquake preparedness enrichments including materials to build a two-bucket toilet system, a gas meter and wrenches to practice turning off the gas, an emergency Go Bag, and a variety of informational materials. Drs. Safran and Drake attended the enrichment tables and talked with visitors about earthquake preparedness. The third context was in the Teen Tech Center (TTC), a space available only to visitors aged 13 to 18. The TTC contains a variety of activities and resources such as sewing machines, photography equipment, drawing tablets, 3D printers, computers, a sound booth, musical instruments. Two of the computers in the TTC featured the Cascadia 9.0 game. While a lower traffic area than the Turbine Hall or Welcome Wall, visitors to the TTC often stay for extended periods of time.

It should be noted that visitor traffic on October 18 was much lower than expected which affected the numbers of groups observed.

Evaluation

A brief professional investigation was conducted during the October 18 event to explore how visitor engagement with the game varied in the different contexts and locations described above. Inquiry questions were focused on 1) how engagement with the game varied in the different contexts, and 2) how playing the game influenced users plans for preparation and intended action related to earthquake preparedness.

How does the game work in different contexts?

- How do people interact with the game in the different locations?
- Are they playing the game alone or in a group?
- How long are they staying?
- How far do they get in the game?
- When do they stop?

Methods and data analysis

Data were collected through observations and surveys. One data collector was present at each location and used convenience sampling to select groups to observe; that is, they observed the next group that fits the selection criteria. Groups at the Welcome Wall and Turbine Hall locations needed to include at least one adult; in the Teen Tech Center, groups needed to include at least one person over the age of 13. If there was a choice between two groups that arrived at the same time, priority was given to the group that included a young adult.

Signage informing visitors of OMSI staff observations was posted in each of the three locations as the method of obtaining implied consent (Gutwill, 2003). After visitors were finished with the game, data collectors approached them to ask if they would be willing to complete a short survey regarding their experience.

Observations

Data collectors used an observation form (Appendix A) for each group. On the form, they recorded the location, their best guess as to the age and genders of group members, and used stopwatches to determine the total time groups spent playing the game. In addition, they coded activity in three categories detailed below: Group Dynamic, Activity, and Exit Condition, as well as added notes about changes in group composition, interesting interactions or anything else that seemed relevant or interesting.

Group dynamic

This was intended to capture how groups were engaging with the game and the dynamic between group members. Observers placed a check on the line that best described how the group was using the game and made notes. More than one check mark could be placed if the dynamic changed and notes were made when and potentially why this happened.

Activity

This section captured the parts of the game the group was engaging in and in what order. Observers wrote a number on the 'start' line noting the order in which levels were played. A check mark was placed on the appropriate lines when a level was completed or repeated. A tally was kept of when players died by adding a mark to the line.

Exit Condition

Observers placed a check on the line that best described what was happening when the group stopped playing and left the game, and notes were made to provide any details.

Survey

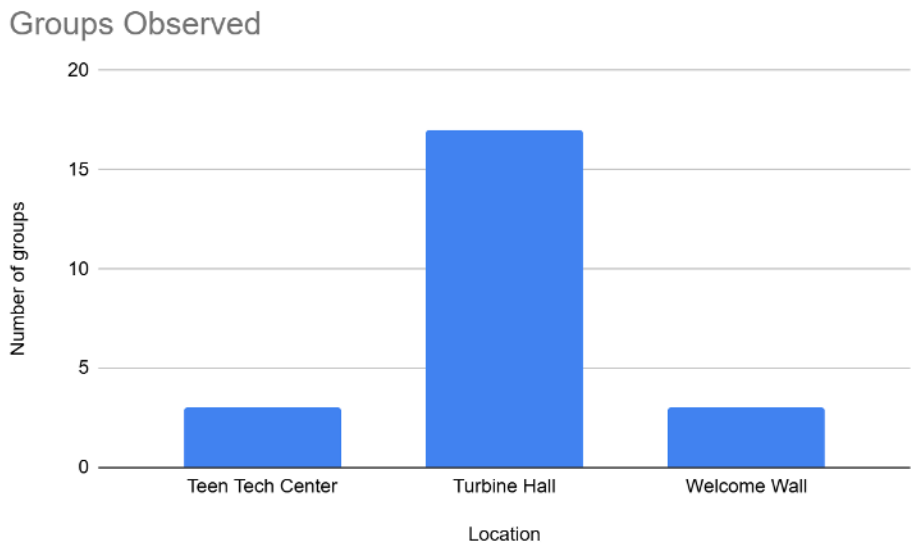
Groups that agreed to complete a survey were given a clipboard with a paper form with three questions (Appendix B):

- After playing the game, what actions will you take at home to prepare for an earthquake?
- What surprised you most about the challenges you will face after a quake?
- To what extent did the Cascadia 9.0 game help you know what to do during and after an earthquake?

In addition to the data collection on October 18, the evaluation team debriefed with Drs. Safran and Drake after the AOD event to document their reflections and anecdotal observations from the evening.

Findings

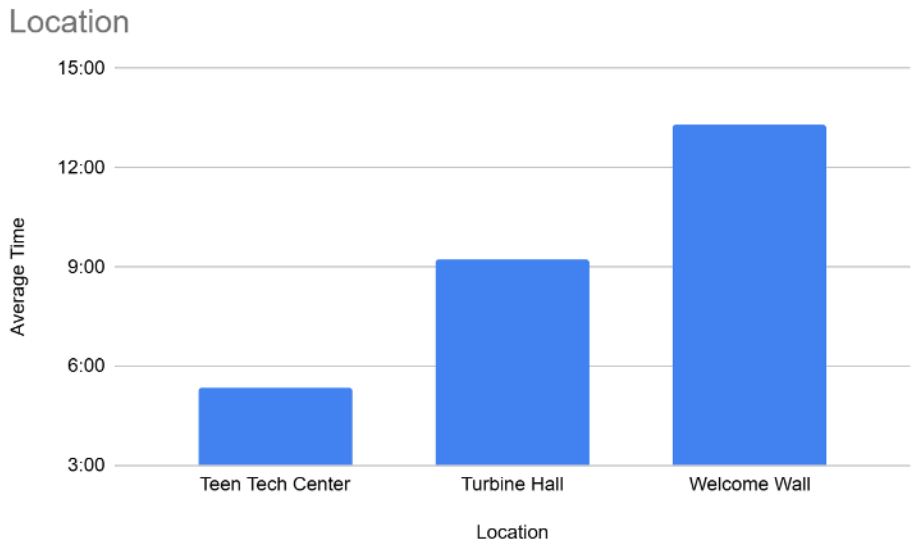
A total of 58 individuals in 23 groups were observed. Most of these (17) were at the Turbine Hall location. Seven groups completed surveys.



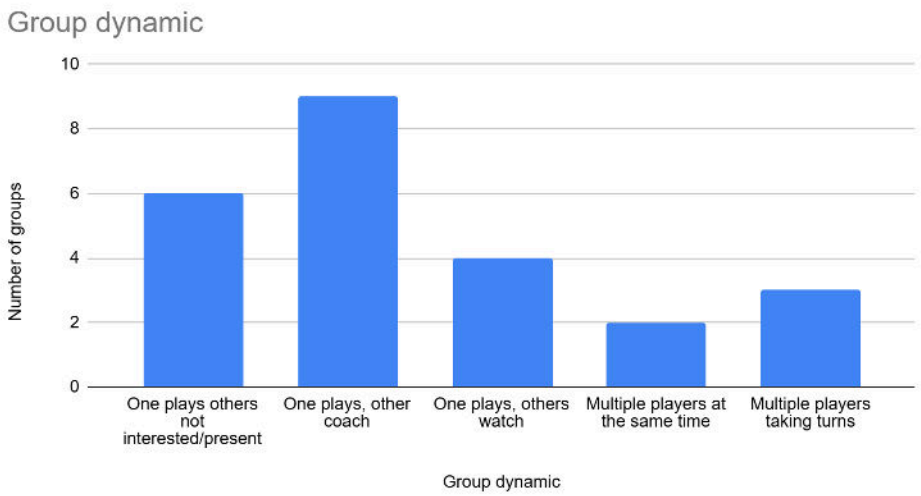
Groups observed ranged in size from one to four people; all but two were groups of two or three. Based on observer estimates, individuals in the groups ranged in age from 6 years old to over 50, and included 18 perceived as female and 40 perceived as male.

Time spent playing the game ranged from just under a minute and a half to over 33 minutes. The average time spent at the game was 9 minutes 26 seconds. Generally speaking, TTC groups spent the least time at the game and Welcome Wall groups the longest. This is consistent with the casual

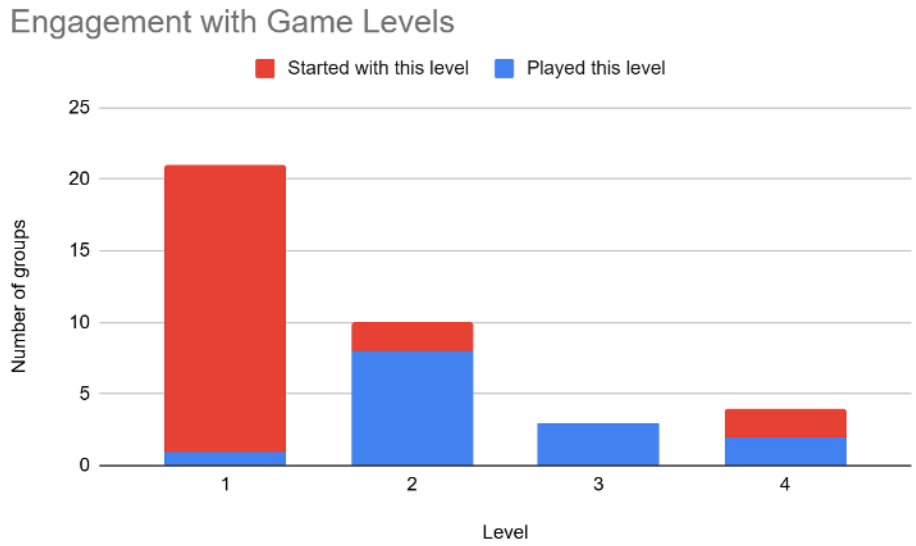
observations from OAD, where observers estimated that groups stayed between five and ten minutes.



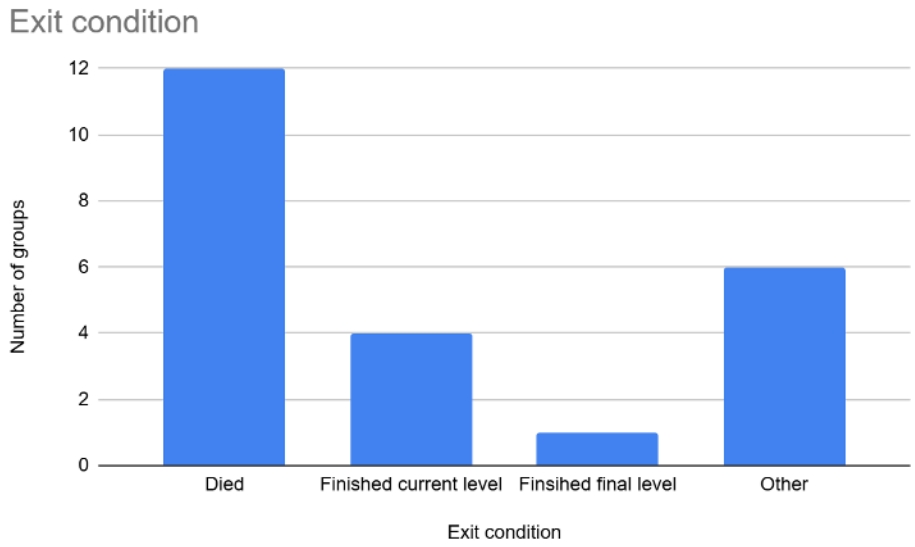
For most groups (17 of the 23), more than one person from the group was engaged with the game. This usually was in the form of one person playing while another was either watching (four groups) or coaching (nine groups). In some cases, people from the group were either playing at the same time at different computers (two groups) or taking turns (three groups). Observers at OAD also noted that there was one person in the pair who was more attentive, though people would often call others over for consultation.



Most groups started at Level 1 of the game though there were instances where people started with Level 2 (two groups) or Level 4 (two groups). Level 1 was also the most frequently played level with 21 groups attempting it. Over half of groups (61%) completed at least one level. Two groups played all four levels - both of these started with Level 1 and went through the levels sequentially.

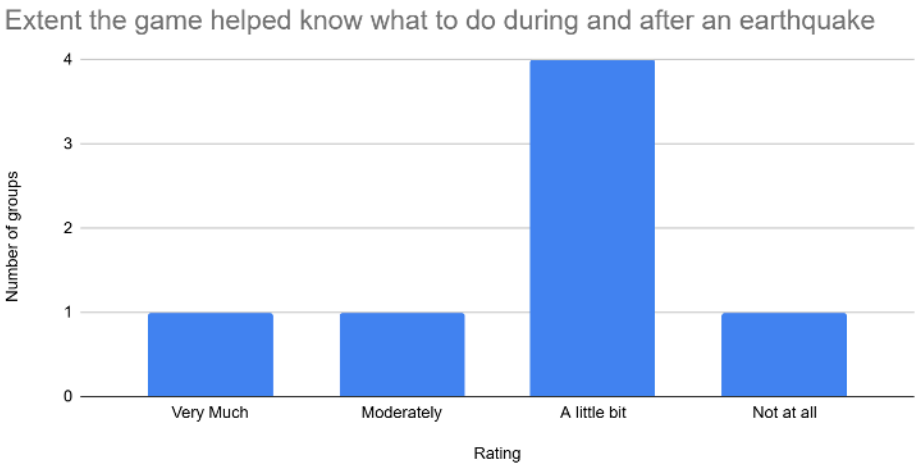


About half of the players (12 out of 23) left after dying in the game. Others stopped when they had completed a level (4) or for some other reason such as joining their group at another exhibit, being called away by their groups, or simply losing interest and leaving. One group completed all four levels.



When asked on the survey what actions they would now take at home to prepare for an earthquake, three mentioned taking cover when shaking starts, two stated that they would secure large or heavy objects, three also mentioned preparing supplies which included food and water. One group said that they would talk more with others. The risk of gas leaks (and the associated risk of fire and explosions) was mentioned most frequently (three of seven groups) as the thing that surprised players most about the challenges they would face after a quake. Also mentioned were the need to find clean water, and sanitation concerns.

Most groups (four of the seven) felt that playing the game would help them a little bit in knowing what to do during or after a quake. When asked to explain their rating, those who selected *A little bit* often said that they already knew much of the material. One group said that the game helped *Very much*, saying "*I didn't realize all of the after effects of an earthquake, good to know and be mindful of*."



Those who selected *Very much* and *Moderately* both engaged with the game in the Turbine Hall and played for over ten minutes.

Interpretation and Recommendations

The study captured only a small number of visitor groups on one day, at one museum, so it is impossible to make any general, conclusive statements about how the Cascadia game should be implemented on the museum floor at other institutions, or at OMSI in the future. The following section summarizes some of the conclusions that are suggested from the limited data available.

Groups were generally successful at playing the game, though very few played through multiple levels. The amount of time played and the location do not appear to affect the number of levels played.

Playing the game appears to reinforce earthquake preparedness knowledge more than introduce new information. While most of those surveyed reported that playing the game only helped them a little bit with regard to knowing what to do during and after an earthquake, all respondents were able to name actions they would take at home to prepare for an earthquake.

In most cases, more than one person from the group was engaged with the game. This usually was in the form of one person playing while another was either watching or coaching. In some cases, people from the group were either playing at the same time at different computers or taking turns.

Older youth (11 to 18) and younger adults (19–29) generally engaged with the game more quickly; that is, they appeared more comfortable with how the controls worked, and were able to navigate through the game right away. Playing the game, however, did not depend on the age of the player. Casual observations during the OAD event suggest that older adults appeared to get frustrated more quickly.

The Turbine Hall location, which represented the game as a stand alone experience set among thematically similar components seemed to attract the most groups.

There was very little traffic in the TTC the day of data collection with only seven people visiting. Most of the teens who came into the TTC (five of those seven), however, tried the game. TTC visitors played for less time than average suggesting that the relaxed pace of the teen-only space did not lead to longer play times.

Enrichments at the Welcome Wall did not appear to enhance the gaming experience. If a child was engaged with the game, adults would visit enrichments, though typically for only a minute or two.

Many adults stopped to talk about the enrichments, some for an extended length of time, and did not engage with the game. Based on reflections from the facilitators, people enjoyed having something to do, such as practicing turning off the gas and getting a free wrench. The position of the game behind the enrichment tables may have affected the number who approached it as they may have seen it not as something they could engage with. The average time at the game was highest at the Welcome Wall. While the somewhat secluded position of the computers may have led to fewer groups playing, the lack of distractions may have led to longer play times.

The interpretations above are certainly speculative, and more data would need to be collected before more definitive conclusions could be drawn. Based on the data gathered, however, there are several recommendations that can be made for those who may put the Cascadia 9.0 game on their exhibit floor.

Presenting the game in a way that makes it clear to visitors that it is an experience that they are invited to use is essential. Exhibiting the game as a stand alone experience among thematically related components will likely draw the most visitors. Currently, the game is browser-based. For this study, staff were present to ensure that visitors did not navigate away from the gamepage, and to reload the page when a group was finished, getting the game ready for the next group. It is recommended that a local, desktop version be utilized that has an automatic reset if the game has been inactive for more than a couple of minutes. Finally, providing controllers, as opposed to using a keyboard for play, would likely make gameplay easier and more intuitive for a museum experience.

This study suggests that there is great potential for using the Cascadia 9.0 game as a short-term visitor experience on a museum floor. While there are small modifications that would need to be made to ensure a positive and safe visitor experience, the game appears relatively intuitive and engaging and is a great way to remind people about what to expect and how to respond during and after an earthquake.

References

Nilsen, E., Safran, E., Drake, P., & Sebok, B. (2020). Playing a Serious Game for Earthquake Preparedness: Effects of Resource Richness and Avatar Choice. In *Extended Abstracts of the 2020 CHI Conference on Human Factors in Computing Systems*, pp. 1–7.

Safran, E. B., Erik Nilsen, Drake, P. and Sebok, B. (2024). Effects of video game play, avatar choice, and avatar power on motivation to prepare for earthquakes. *International Journal of Disaster Risk Reduction* v. 101: 104184.

Appendix A: Cascadia Observation Form

Cascadia 9.0_Observation form **Group #:** **Total time spent:**

Date:	Observer:	Notes about the group:

Group ages: 0-5____ 6-10____ 11-14____ 15-18____ 19-29____ 30-49____ 50+____

(↑ Write M for each male, F for each female, X when no guess is made) Location(Circle one): Welcome Wall Teen Tech Center Exhibit floor

How does the group engage with the activity?

	Description	**Notes** (Give examples of what they say or do)
Group dynamic How are people interacting with the game?	___ One plays others not interested/present ___ One plays, others watch ___ One plays, other coach ___ Multiple players taking turns ____ Multiple players at the same time	
Activity What are they doing? Write a number on the start line to note which order levels were played.	Level 1 ____ Start ____ Complete _____ Repeat ____Died Level 2 ____ Start ____ Complete _____ Repeat ____Died Level 3 ____ Start ____ Complete _____ Repeat ____Died Level 4 ____ Start ____ Complete _____ Repeat ____Died	Enrichments time start_____ time stop _____ ____ Go bag ____ Two-bucket toilet ____ Gas meter ___ Giveaways How much time did the group spend with the enrichments? _____
Exit condition	What was happening when the group stopped playing? ___Finished their current level ___Finished their final level ___ Died ___ Other	

Appendix B: Cascadia 9.0 User Survey

After playing the game, what actions will you take at home to prepare for an earthquake?

What surprised you most about the challenges you will face after a quake?

To what extent did the Cascadia 9.0 game help you know what to do during and after an earthquake?

Not at all	A little bit	Moderately	Very much
○	○	○	○

Please explain: