UNIVERSITY *of* WASHINGTON

COMMUNICATING JELLYFISH SCIENCE THROUGH GAMES

BRI GABEL [1], LYDDIE AUSTIN [2], & CHLOE RABINOWITZ [3]

[1] Museology Graduate Program | [2] Department of Engineering | [3] School of Environment & Forest Sciences

PROBLEM

Jellyfish are a largely misunderstood animal from the public's perspective. Displays of jellyfish in public aquariums are completely separated, disconnecting them from their place in the food web. By communicating their ecological impact, place and presence in the food web, the public can develop an appreciation for the species with help from aquariums.

The purpose of this project is to provide aquariums a variety of tools to communicate the role of jellyfish in food webs in order provide the public a more holistic understanding of Puget Sound ecology.

WHY GAMES?

1. The key to science communication is creating a "personal response" to science through formal or informal learning (Burns et al., 2003). This includes an awareness, enjoyment, interest, opinion forming experiences, and understanding.
2. Visualization also helps with contextual processing of situations that may have a variety of perspectives and outcomes. Recently interactive digital media has enhanced the way instructors illustrate and communicate scientific ideas such as food webs (Yoon et al., 2015).
3. Informal education opportunities can border entertainment, and are critical to facilitate fluency, expertise, and general understanding of scientific concepts (Bell et al., 2008).
4. Recently, there has been an increased interest in epistemic games: games that teach career skills (Shaffer, 2006). These games are framed around skills, knowledge, values and identity, and aim to allow the user to virtually experience the world through this framework. Through this, not only can science be communicated, it can be taught.

REFERENCES

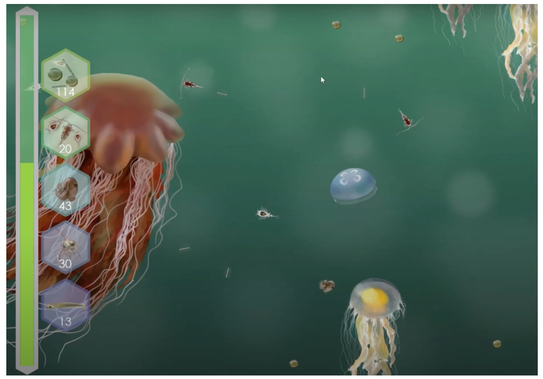
Bell, P., Lawenstein, B., Shouse, A., & Feder, M. (2008). Part 1: Learning Science in Informal Environments. Learning Science in Informal Environments: People, Places, and Pursuits (pp. 11–53).

Burns, T. W., O'Connor, D. J., and Stocklmayer, S. M. (2003). Science communication: a contemporary definition. Public Underst. Sci. 12, 183–202. doi: 10.1177/09636625030122004

Shaffer, D. W. (2006). How computer games help children learn (1st ed). Palgrave Macmillan.

Yoon, I., Williams, R., Levine, E., Yoon, S., Dunne, J., Martinez, J., (2015). Webs On The Web (Wow): 3D Visualization Of Ecological Networks On The WWW For Collaborative Research And Education, SPIE-IS&T, 5295:124-132.

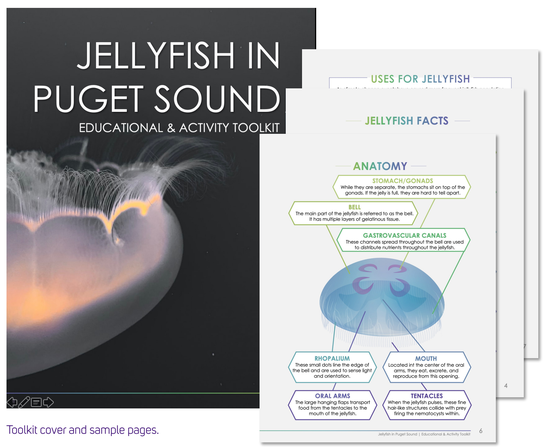
PRODUCTS



Screenshot of *Plankton Pursuit* gameplay.

BOARD GAME

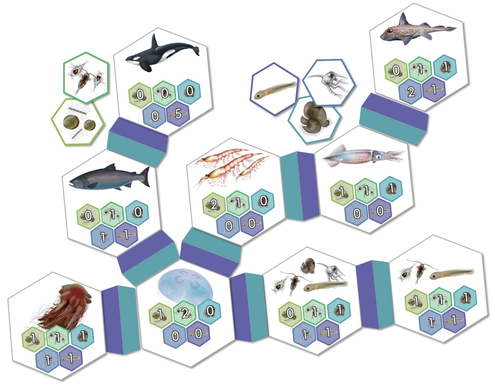
A printable, cooperative board game was also produced alongside the video game. Similar to *Plankton Pursuit*, *Food Web Frenzy* was designed to allow players to explore Puget Sound's food web centered around jellyfish and using plankton as currency. However, this game allows up to four players to build an infinite number of possible connections utilizing the unique attributes of local jellyfish species.



Toolkit cover and sample pages.

VIDEO GAME

A web browser-based video game titled *Plankton Pursuit* was developed, illustrated, and coded by the team to allow players to explore the waters of Puget Sound as a jellyfish. By swimming around, the player collects plankton while avoiding predators including larger, predatory jellyfish and salmon. Using the collected plankton, players can unlock 40 Puget Sound species on the food web to learn more about how they connect with one another.



Example food web built with the board game. Predators have purple edged tiles while prey have blue edges.

EDUCATIONAL & ACTIVITY TOOLKIT

The final product of this project an educational and activity toolkit designed to supplement information about jellyfish specifically within Puget Sound. The content of this toolkit was designed in response to local, public educators' requests, specifically those with little background in STEM, for information about jellyfish ecology, biology, and human influence. Activities aimed at children a variety of ages that would help develop scientific curiosity were also included.

PROCESS

The decision behind making a series of games to communicate the ongoing research in the Keister Lab in the School of Oceanography was twofold:

- Due to the COVID-19 pandemic, many marine educational facilities were closed, leaving an online approach as the best option.
- Food webs and ecology are abstract topics that are difficult to engage with to develop understanding.

The development of the board game was done in Winter 2021 with the help of the instructors of the SEFS 590: *Environmental Holistic Storytelling & Game*s course. Assets from the board game were used to build the video game in the spring.

These games were designed with the intent of not framing jellyfish as the "enemy". Since many people fear jellyfish, the choice to highlight their importance while still maintaining the suspense of "eat or be eaten".

NEXT STEPS

Fortunately, any product of this project can be used by aquarium educators when they can safely reopen or be accessed if they remain closed. These tools will be made available online through Washington Sea Grant. Over the next year, utilizing partnerships with local aquariums and community marine centers, elements will be integrated into existing programming and/or exhibits or into new curriculum as well as leveraging their social media to reach their audiences directly.

ACKNOWLEDGEMENTS

SPECIAL THANKS TO WASHINGTON SEA GRANT FOR FUNDING THIS RESEARCH & PROJECT DEVELOPMENT

COMMITTEE MEMBERS

Angie Ong, Julie Keister, Ph.D.,
Correigh Greene, Ph.D., & Kathryn Sobocinski, Ph.D.

VIDEO GAME DEVELOPMENT

Matt Wilson, Chance Martineau, Gunnar Martineau,
& Braylee Martineau