

## Undergraduate Research Symposium May 18, 2018 Mary Gates Hall

### Online Proceedings

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#### SESSION 1D

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##### MARINE ECOLOGY AND FOOD WEBS

*Session Moderator: Bonnie Becker, Environmental Science (Tacoma)*

**MGH 228**

*12:30 PM to 2:15 PM*

\* Note: Titles in order of presentation.

##### **Consumption across Temperature and Size in Dungeness and Graceful Crabs: Bioenergetic Implications for Ecology and Fisheries Management**

*Grace Rachele Workman, ,*

*Mentor: P. Sean McDonald, Program on the Environment*

Dungeness crabs (*Cancer [Metacarcinus] magister*) hold commercial and cultural value in Washington State, yet little is known about the effects of climate change on their population—even less is known about their competitor, the graceful crab (*C. [M.] gracilis*). To investigate the effects of temperature and size on feeding rate, we conducted consumption experiments in aquaria at multiple temperatures and across a variety of sizes (70-100mm carapace width) of Dungeness and graceful crabs. We investigated their weight-specific feeding rates, egestion, and excretion via a basic mass balance bioenergetic equation in which consumption must equal respiration, egestion, excretion, and growth. We measured the egestion and excretion components of consumption by collecting unconsumed food material and fecal material, respectively. This multi-species comparison evaluates size and temperature-dependent feeding patterns that have implications for future spatial distributions and energy requirements of Dungeness and graceful crabs across Puget Sound. Future management of the fishery and ecological impacts under changing conditions are discussed.

#### POSTER SESSION 2

**Commons West, Easel 13**

*1:00 PM to 2:30 PM*

##### **Water Remediation Challenges in China: Possible Solutions & Implications for Global Environmental Injustice**

*Peiling Li, ,*

*Mentor: Yen-Chu Weng, Program on the Environment*

*Mentor: P. Sean McDonald, Program on the Environment*

This abstract is no longer available.

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#### SESSION 2K

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##### ENGAGING OUR ENVIRONMENT

*Session Moderator: Kyle Armour, Oceanography and Atmospheric Sciences*

**MGH 284**

*3:30 PM to 5:15 PM*

\* Note: Titles in order of presentation.

##### **How "Pura Vida" Can Combat the Climate Crisis**

*Alexandra Lyn Johnson, ,*

*Mary Gates Scholar, UW Honors Program*

*Mentor: P. Sean McDonald, Program on the Environment*

*Mentor: Kristi Straus, Program on the Environment*

Climate change is an issue that affects every region of the world, but it has a disproportionate impact on coastal communities and developing countries. Fitting both of these criteria, Costa Rica is extremely vulnerable to the impacts of climate change. Currently, Costa Ricans are known for living "pura vida", or the pure life, and the country consistently ranks #1 on the Happy Planet Index, a global index of sustainable well-being. The main goal of my study was to assess how closely a relationship with the environment impacts one's perception of success. As an intern for Frontier Programs in Costa Rica, I engaged in conservation research in the Osa Peninsula, subsequently interviewing twenty locals to attempt to answer how environmental relationships and definitions of success are intertwined. Frontier Programs' goal is to seek out conservation hotspots and work with locals to empower them in future conservation action. My results support the argument that a connection to the environment affects factors people use to define success: happiness, health, and job security. Costa Rica is already feeling the effects of climate change and a loss of biodiversity, and further degradation of this unique natural area has the potential to lead to a decreased connection to nature. This creates a compelling argument for enhancing the climate

resiliency of Costa Rica. Closer to home, my work could be extended to make the case that Americans can increase their overall perceptions of success by developing closer relationships with the natural world.

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## SESSION 2K

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### ENGAGING OUR ENVIRONMENT

*Session Moderator: Kyle Armour, Oceanography and Atmospheric Sciences*

**MGH 284**

*3:30 PM to 5:15 PM*

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#### **Empower Communities, Inspire Change: How Environmental Education Grants Make a Difference**

*Anna Marie Johnson, ,*

*Mentor: P. Sean McDonald, Program on the Environment*

It is no secret environmental issues are increasing in quantity and severity with passing time. The U.S. Environmental Protection Agency (EPA) is tasked with addressing these issues through its programs and regulatory authority. With a large portion of the EPA's budget allotted to grants, it becomes increasingly important to measure the success of funded projects to ensure they are achieving their intended goals. Grants awarded for environmental education specifically bring awareness to environmental literature and curriculum. This in turn inspires critical thinking, problem solving, and action. Through my internship with the Office of Public Engagement and Environmental Education at the EPA, I aimed to discover what prescriptive criteria EPA should require from their grantees, in hopes of funding impactful projects and collecting data to leverage the program's legacy. I synthesized final reports of environmental education grants issued since 2012, interviewed EPA personnel, interviewed grantees, and conducted a thorough review of documents within the environmental education grant process. I discovered stark differences in the definitions of "success" between the grantees and their communities as compared to political and agency structures. Realigning these measurements of success allows EPA to allocate grants to promising projects and use the limited available funding to make a difference. Empowering communities through grants allows them to educate their communities in ways they know best, but also provides them with the encouragement to commit to action and use public involvement for solving environmental challenges.