Applied Fisheries Program Assessment Report

Academic Year 2020 - 2021

Program Director
Joel Markis
Associate Professor of Applied Fisheries
jamarkis@alaska.edu
https://uas.alaska.edu/career_ed/fisheries/index.html
1332 Seward Avenue Sitka, Alaska 99835
(907) 747-7700
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1. Program Overview

The Applied Fisheries Program (formerly Fisheries Technology / FT) is an industry driven program that focuses on career training to put students to work. The Applied Fisheries program is the only one and two-year, entry-level academic program in fisheries in the UA system. The mission of the program is to provide students with a broad educational and practical foundation in the field of fisheries, aquaculture, and mariculture. Students will be prepared for entry level employment in federal or state agencies, private-non-profit aquaculture and mariculture facilities (PNPs), and various private sector fisheries employers. Students will also be prepared to progress from the two-year degree to related four-year degrees should they choose to continue on academic pathways. The goal is for program graduates to fill high demand fisheries jobs in Alaska or pursue a Bachelor’s degree in fisheries or related fields.

This Program Level Student Learning Outcomes Assessment Report is for the Applied Fisheries AAS, the Certificate (Alaskan Aquaculture Emphasis and Fisheries Management Emphasis) and the three Occupational Endorsements (Alaskan Aquaculture, Fisheries Management, and Scientific Diving).

2. Program Student Learning Outcomes (SLOs)

Goal 1. Students will describe ecological attributes of fish and their habitats.
Outcome 1.1. Students will identify common commercial species of Alaska and understand their habitat needs.
Outcome 1.2. Students will describe water as an environment for life.
Outcome 1.3. Students will convey fishery information to faculty and classmates.

Goal 2. Students will demonstrate sound field sampling techniques.
Outcome 2.1. Students will collect, analyze, and present fisheries data utilizing standard methodologies.
Outcome 2.2. Students will describe the importance of following protocols and techniques; utilizing good field data collection techniques and data recording techniques.
Outcome 2.3. Students will describe methodologies and protocols; practice good data management skills; summarize and communicate findings.
Outcome 2.4. Students will discuss the importance of correct data collection and analysis.

Goal 3. Students will operate safely while participating in program activities and utilizing program equipment.
Outcome 3.1. Students will identify methods for reducing injury in the field and lab setting.
Outcome 3.2. Students will discuss safe operating procedures for equipment; assess field conditions to determine safety guidelines to follow.
Outcome 3.3. Students will discuss the importance of promoting safety for self and others and equipment.

Goal 4. Students will describe the basic principles of salmon enhancement techniques used in Alaskan hatcheries.
Outcome 4.1. Students will describe the basic process involved in fish rearing.
Outcome 4.2. Students will take part in “hands-on” procedures to ensure successful output of fish.
Outcome 4.3. Students will describe attributes of Salmon Culture facilities in Alaska.

Goal 5. Students will describe management and legal frameworks within which marine fisheries exist.
Outcome 5.1. Students will describe the legal and regulatory framework of marine fisheries in Alaska.
Outcome 5.2. Students will describe the current status of marine fisheries statewide.
Outcome 5.3. Students will describe the social and economic value of Alaska fisheries to the state and nation.

3. How data are collected on the Program SLOs
   The Applied Fisheries program has detailed Student Learning Outcomes (SLOs) that are hierarchically nested from the individual lesson, to the course, to the program level. As part of this program level student learning assessment, we collect data on program enrollment, student learning via exam scores, summary reports of exam effectiveness (Appdx A), comparison of pre and post course exams, student evaluations, and through surveys of program graduates (Appdx B).

4. The data collected on the Program SLOs during the previous academic year (AY 2020 - 2021)
   Student Enrollment Data - In Academic Year 2020 - 2021 the Applied Fisheries Program had a student headcount (SHC) of 271 students who took 807 student credit hours (SCH).

![Figure 1. Student Credit Hours (SCH) by Academic Year]
**Student exam scores** – Though exam scores show that students have a certain measure of knowledge at the time of taking each exam, it does not account for what students bring into the classroom.

- Fall 2020 – Mean grade percentage 83.68 ± 2.44 SE % (n=238)
- Spring 2021 – Mean grade percentage 85.57 ± 2.45 SE % (n=155)

**Summary reports of exam effectiveness** – During this academic year, most students took digital exams which allow us to examine student performance on individual learning outcomes, assessment reliability, as well as individual exam question performance (Appdx A). A summary report for each exam is printed and evaluated based on 1) assessment reliability (Kuder-Richardson Formula 20 where each exam is scored on the likelihood of a student repeating the same performance), 2) student performance on individual learning outcomes or content categories, and 3) individual exam question performance to ensure that students are comprehending the information associated with each learning outcome. An example summary report can be found in Appendix A.

**Table 1. Cumulative Assessment Reliability for exams during AY 2020 - 2021**

<table>
<thead>
<tr>
<th>Assessment Reliability</th>
<th>Exam 1</th>
<th>Exam 2</th>
<th>Exam 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>AY20-21</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FT 120</td>
<td>.66</td>
<td>.88</td>
<td>.83</td>
</tr>
<tr>
<td>FT 122</td>
<td>.77</td>
<td>.79</td>
<td>.73</td>
</tr>
<tr>
<td>FT 222</td>
<td>.75</td>
<td>.76</td>
<td>.92</td>
</tr>
<tr>
<td>FT 272</td>
<td>.89</td>
<td>.87</td>
<td>.94</td>
</tr>
<tr>
<td>FT 274</td>
<td>.38</td>
<td>.63</td>
<td>.54</td>
</tr>
<tr>
<td>OCN 101</td>
<td>.81</td>
<td>.84</td>
<td>.76</td>
</tr>
</tbody>
</table>

**Pre and Post exams scores** – To determine what students learned during their course, we conduct pre and post exams for all Fish Tech courses (n=119 students). Students are given a 30 question exam prior to receiving any content in each class, and at the end of the course, students are given the same exam.

- Mean scores for pre exams were 57.9 ± 3.4 SE %
- Mean scores for post-exams were 85.6 ± 1.8 SE %
- Mean improvement between pre and post exams was an increase of 27.7 ± 3.1 SE %

**Student Evaluations** – Though student evaluations do not explicitly relate to knowledge gained by students, they allow us to evaluate student perception of the content and curriculum, and infer how students learn so that we may improve our delivery and content for future courses. As part of our evaluations we ask students if they thought the courses were valuable, if they would take another course from us, and if they would recommend our classes to other students. In addition we ask students if there is anything they would change about the course.
In fall 2020 (n=20 surveys)
- 90% of students said they would recommend this course to a friend
- 93% of students said they found their course valuable
- 90% of students said they would take another course

In spring 2021 (n=12 surveys)
- 100% of students said they would recommend this course to a friend
- 92% of students said they found their course valuable
- 87% of students said they would take another course

Survey of Graduates – Summer 2018
During Summer 2018, UAS Fish Tech students were asked to fill out a short Google Form with respect to their completion status, connection with fisheries industries, employment organizations, perception of Fish Tech curricula helping with current employment and further education (N=30 students; Appdx B)

Writing Assignments and Creative Projects
Part of our assessment tools include weekly writing assignments and three larger creative projects in the majority of our distance courses. These assignments are “artifacts of learning,” where students are asked to in essence, teach content, one the highest levels of learning according to Bloom’s Taxonomy. In addition to being another assessment tool for our faculty to assess student learning, the introduction of writing assignments and creative projects also allows students to have a diverse set of learning opportunities available, reducing the pressure on students that do not score well on exams.

Certifications for semester intensives
Student learning is additionally assessed via demonstration of “skills practicals,” which when complete, allows for national and international certification. These assessments were initially utilized in our O.E. in Scientific Diving and the success of this model has allowed the creation of two additional Occupational Endorsements (Alaskan Aquaculture and Alaskan Mariculture) where students success and learning are assessed through traditional exams, pre and posttests, and hands on skills practicals resulting in certifications. The first of these additional OE’s was offered in the Fall of 2021 and the other will be offered in Fall 2022.

5. Evaluation of Student Learning Data from the previous academic year
In AY 2020-2021, the Applied Fisheries program increased enrollment from the previous year with respect to Student Headcount (n=274) and Student Credit Hours (n=807). These increases in student enrollment were despite the aftermath of devastating university budget declines and during an ongoing global pandemic. These increases not only show the resilience of the program and faculty, but the demand for the courses and degrees offered which is not a direct measure of student success, but could be considered a relative proxy.
Exams scores for this academic year averaged in the B range and through evaluations of testing effectiveness, an average of 82% of students would likely repeat the same performance on their exams.

Pre and post exams allow us to not only determine improvement in learning, but also the level where students are coming into classes. Mean pre-test scores were approximately 58% and post-test scores around 86%. When examined individually these data suggest student knowledge improved by approximately 28% by the end of their courses.

Almost all of the students that completed end of course surveys (approximately 1/3) said that they found the courses informative, would take another course, and would recommend an Applied Fisheries course to a friend.

In Summer 2018, Fish Tech faculty surveyed recent graduates and asked them if they thought their courses have prepared them for the workplace. Of 30 student surveys, 77% said that they were working in the fisheries industry, 100% said that they felt that their Fish Tech education helped prepare them for their current job and at least 24% said that they have continued on to a higher level of university education.

Introducing Writing Assignments and Creative Projects has allowed faculty other tools to assess student learning and students to enhance their education using different types of tools. These additional tools were widely popular with students because they felt they learned materials in a more in-depth manner and it allowed them to apply theoretical information to their personal life and experiences.

Finally, the development of a semester intensive course sequence has allowed students from all over the country to visit Alaska, take University of Alaska courses, and complete a number of credentials over a short period of time. This new direction in teaching has allowed Fish Tech faculty to assess student learning “face to face,” while offering students career skills with University credentials that lead to jobs.

6. Future Plans to Improve Student Learning
Applied Fisheries faculty will continue to evolve the engagement and evaluation of distance programs while continuing to develop semester intensive and lab based programing that prepares students for career opportunities over a short time period.

In the near future, the Fish Tech program will:

- Continue to offer high-impact learning opportunities to diversify student learning opportunities including Semester Intensives (second Alaskan Aquaculture Semester Fall 2022 and fourth Alaska Dive Semester Spring 2023) and field lab practicums (FT 125, 150, 188, 189, 194, 212, 223, MTR 119, MTR 120)
- Continue to Enhance Dual Enrollment engagement of fisheries curriculum to High School students across Alaska including additional collaboration with Secondary School teachers and counselors to better ensure student success and assessment of learning.
- Further utilize existing tools (Linked Dual Enrollment Student Success Report SP 2020) and additionally evaluate student learning with respect to Dual Enrollment Students and Applied Fisheries offerings.
- Develop tools to assess student success in traditional online courses that do not utilize external testing software and packages.
- Promote professional development opportunities to Applied Fisheries faculty that enhance and focus on pedagogy and pedagogy development.
- Pursue hiring an additional faculty member given continued program growth and success of semester intensive offerings in order to free up existing faculty time to further refine pedagogy, course content, and assessment of learning.
Appendix A. Example Assessment Reliability Report

ASSESSMENT PERFORMANCE

77% 55% 95%

Average Score (49.9/65) Low Score (36/65) High Score (62/65)

Assessment Score Reliability (KR-20)

Likelihood of students repeating the same performance.

LEARNING OUTCOMES (Category Performance)

FT 120 - Exam 1

- Dive fisheries in Alaska
- Biology
- Fisheries
- Management
- Research

Course: FT 120 Fisheries of Alaska • Instructor: Lauren Wild • Questions: 65 • Exam Takers: 22
## Appendix B. Summer 2018 Graduate Student Survey

When did you graduate?

<table>
<thead>
<tr>
<th>Year</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014-2015</td>
<td>1</td>
</tr>
<tr>
<td>2015-2016</td>
<td>2</td>
</tr>
<tr>
<td>2016-2017</td>
<td>5</td>
</tr>
<tr>
<td>2017-2018</td>
<td>6</td>
</tr>
<tr>
<td>I was just taking classes</td>
<td>7</td>
</tr>
<tr>
<td>I am still working on it</td>
<td>9</td>
</tr>
</tbody>
</table>

Are you working in the fisheries industry?

<table>
<thead>
<tr>
<th>Answer</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>23</td>
<td>77%</td>
</tr>
<tr>
<td>No</td>
<td>7</td>
<td>23%</td>
</tr>
</tbody>
</table>

What organization do you work for and what is your job title?

- AAE Tech Services. Fisheries Technician
- ADF&G, Fishery Biologist I
- Downeast Institute-Hatchery Tech
- USGS research wildlife biologist
- Chilkat Indian Association / Fish tech
- US Coast Guard
- Simon Fraser University, Research Assistant
- Fish Tech II at the Hernandez Sport Fish Hatchery
- Kodiak Regional Aquaculture Association, Fish Culturist
- Fish and game, title- fish technician II
- Valdez Fisheries Development Association (Solomon Gulch Hatchery)
- Icicle Seafoods-Quality Assurance Manager
- National Park Service, Regional Chief of Contracting
- Coastal Villages Region Fund, Corporate Counsel
- Anchorage Museum
- Allen Marine whale tours: guest services
- Prince of Whales Eagle Lodge - Charter Captain
- SSRAA lead fish culturist
- Kansas State University - Graduate Research Assistant
- ODFW/Fish Tech
- SSRAA - Lead Research Technician
- NSRAA, Administration
- Hotel. Desk receptionist
- Saltwater INC - observer
- US Fish and Wildlife Service
- Kodiak Regional Aquaculture Association as a Logistics Tech
- Port Armstrong hatchery-fish culturist
Do you feel like your Fish Tech education helped you prepare for your current career?

<table>
<thead>
<tr>
<th>Yes</th>
<th>30 (100%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>0 (0%)</td>
</tr>
</tbody>
</table>

Have you taken any further education in fisheries/marine sciences?

<table>
<thead>
<tr>
<th>Yes</th>
<th>7 (24%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>10 (33%)</td>
</tr>
<tr>
<td>Not answered</td>
<td>13 (43%)</td>
</tr>
</tbody>
</table>