<table>
<thead>
<tr>
<th>Program Information</th>
<th>University: Graduate Learning Outcomes (GLOs) for Masters students (approved by Faculty Senate on January 13, 2011)</th>
<th>Program Level Student Learning Outcomes (add additional columns if needed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program:</td>
<td>MS Water Resources Engineering</td>
<td></td>
</tr>
<tr>
<td>Reporting Time Period:</td>
<td>AY 2019-2020</td>
<td></td>
</tr>
<tr>
<td>College or Administrative Division:</td>
<td>The Graduate School</td>
<td></td>
</tr>
<tr>
<td>Subunit(s)</td>
<td>Water Resources Graduate Program</td>
<td></td>
</tr>
<tr>
<td>Report Submitted By:</td>
<td>Mary Santelmann, Professor and Director</td>
<td></td>
</tr>
<tr>
<td>Email address:</td>
<td><a href="mailto:Mary.Santelmann@oregonstate.edu">Mary.Santelmann@oregonstate.edu</a></td>
<td></td>
</tr>
<tr>
<td>Date Submitted:</td>
<td>June 15, 2020</td>
<td></td>
</tr>
<tr>
<td>Due Date:</td>
<td>June 1, 2020</td>
<td></td>
</tr>
<tr>
<td>URL to Program GLOs:</td>
<td>Each program must have their GLOs listed on their website; URL here. <a href="https://gradwater.oregonstate.edu/student-resources">https://gradwater.oregonstate.edu/student-resources</a></td>
<td></td>
</tr>
<tr>
<td><strong>Outcomes</strong>: University and program level student learning outcome (GLO)</td>
<td>Conduct research or produce some other form of creative work</td>
<td>Conduct original research extend knowledge in water resources engineering</td>
</tr>
<tr>
<td></td>
<td>Demonstrate mastery of subject material</td>
<td>Demonstrate in-the ability to carry out original and useful research in some area of water resource engineering.</td>
</tr>
<tr>
<td></td>
<td>Conduct scholarly or professional activities in an ethical manner</td>
<td>Communicate professionally about water resources and water resources research in engineering.</td>
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<tr>
<td></td>
<td></td>
<td>Demonstrate a commitment to diversity and high ethical standards in scholarship, teaching, and service.</td>
</tr>
<tr>
<td><strong>Outcomes</strong>: What year was this program level learning outcome developed or most recently changed?</td>
<td>NA</td>
<td>2004</td>
</tr>
<tr>
<td></td>
<td>NA</td>
<td>2004</td>
</tr>
<tr>
<td></td>
<td>NA</td>
<td>2004</td>
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<td>2004</td>
<td>2004</td>
</tr>
<tr>
<td></td>
<td>2004</td>
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<tr>
<td>Assessment Method</td>
<td>Completion and successful defense of thesis.</td>
<td>Completion of coursework required for the degree.</td>
</tr>
<tr>
<td>-------------------</td>
<td>-------------------------------------------------</td>
<td>------------------------------------------------</td>
</tr>
<tr>
<td>Assessment Method: List the measures or instruments used to assess each outcome. [How do students demonstrate their attainment of the learning outcome? How is their learning evaluated?] At least one of these must be a direct measure. For additional guidance see: <a href="http://oregonstate.edu/admin/aa/apaa/assessment-resources">http://oregonstate.edu/admin/aa/apaa/assessment-resources</a></td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>Assessment Method: Has this assessment method changed since the last reporting cycle? Yes or No. Explain any changes.</td>
<td>NO</td>
<td>NO</td>
</tr>
</tbody>
</table>

1In order to explore trends in the data, we advise that assessment method remain consistent from year-to-year.
### Benchmark

What benchmark or milestone - related to the specific measure or instrument - is used to determine whether the outcome has been satisfactorily met by the students?

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>Successful thesis defense</th>
<th>Passing courses required for the degree with grade of B or better</th>
<th>Completion of CITI modules on research ethics</th>
<th>Successful thesis defense or passing final project defense and examination</th>
<th>Passing courses required for the degree with grade of B or better</th>
<th>Presentation of research to committee at initial proposal defense and final defense</th>
<th>Completion of CITI modules on research ethics</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

### 2

In order to explore trends in the data, we advise that benchmarks remain consistent from year-to-year.

### Process used for gathering assessment data

Process: Describe the data collection process (e.g., Who is involved? How is the data collected?)

See Appendix A and Appendix B.

See Appendix A and Appendix B.

See Appendix A and Appendix B.

See Appendix A and Appendix B.

### What do the data show about student learning?
**Results:** What do the data show about student learning relative to the specific learning outcome? Describe any result, pattern, or trends that you identify as meaningful or that highlights an area(s) of concern or success. You must provide data to substantiate your claims.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th>See Appendix A and Appendix B.</th>
<th>See Appendix A and Appendix B.</th>
<th>See Appendix A and Appendix B.</th>
<th>See Appendix A and Appendix B.</th>
</tr>
</thead>
</table>

**Actions:**

**Actions:** Describe any course-level (content, pedagogical, structural, etc.) changes that are an outgrowth of the current year’s assessment of this outcome. Include timelines.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th>None</th>
<th>None</th>
<th>None</th>
<th>None</th>
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</thead>
</table>

**Actions:** Describe any program or degree-level changes that are an outgrowth of the current year’s assessment of this outcome. Include timeline.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th>We will be communicating expectations about the proposal defense to incoming students and their advisors to reinforce understanding of expectations.</th>
<th>None</th>
<th>None</th>
<th>None</th>
</tr>
</thead>
</table>
## Full-Cycle Impact

**Full-Cycle impact:** If this learning outcome has been assessed previously and is being reported on again this year, what impact have the changes had (if any) on student learning? If you have not previously assessed this learning outcome, please indicate the year you will revisit this outcome.

<table>
<thead>
<tr>
<th>Year</th>
<th>We are satisfied with the student achievement of learning outcomes and do not plan any changes in the foreseeable future.</th>
<th>We are satisfied with the student achievement of learning outcomes and do not plan any changes in the foreseeable future.</th>
<th>We are satisfied with the student achievement of learning outcomes and do not plan any changes in the foreseeable future.</th>
<th>We are satisfied with the student achievement of learning outcomes and do not plan any changes in the foreseeable future.</th>
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</table>

## Process, Reflection and Planning

Describe the process the program used to reflect on the outcome data.

Preparation of this annual assessment

<table>
<thead>
<tr>
<th>Year</th>
<th>No</th>
<th>No</th>
<th>No</th>
<th>No</th>
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</tbody>
</table>

Were there any challenges or concerns?

<table>
<thead>
<tr>
<th>Year</th>
<th>No</th>
<th>No</th>
<th>No</th>
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<th>No</th>
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<tbody>
<tr>
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</tbody>
</table>

How are the results of your assessment effort related to strategic planning and overall program review?

Assessments inform the program annual assessments and biannual report

<table>
<thead>
<tr>
<th>Year</th>
<th>Assessments inform the program annual assessments and biannual report</th>
<th>Assessments inform the program annual assessments and biannual report</th>
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<th>Assessments inform the program annual assessments and biannual report</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<tr>
<td>2</td>
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<td>3</td>
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</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are there specific data archiving notes for the outcome(s) you are reporting on in this report?</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Plans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Describe the unit’s (or sub-units) assessment plans for the upcoming year.</td>
</tr>
<tr>
<td>We will continue to assess performance in coursework and at defenses</td>
</tr>
<tr>
<td>We will continue to assess performance in coursework and at defenses</td>
</tr>
<tr>
<td>We will continue to assess performance in coursework and at defenses</td>
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<tr>
<td>We will continue to assess performance in coursework and at defenses</td>
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<tr>
<td>We will continue to assess performance in coursework and at defenses</td>
</tr>
<tr>
<td>We will continue to assess performance in coursework and at defenses</td>
</tr>
</tbody>
</table>
Table 1. WRE GLO Assessment for PhD graduates for AY 2020; n = 9 graduates, 4 forms returned

<table>
<thead>
<tr>
<th></th>
<th>(a) Does not meet Expectations</th>
<th>(b) Meets Expectations</th>
<th>(c) Exemplary Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Problem Definition: Has stated the research/project problem clearly, providing motivation for undertaking the research</td>
<td>0</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>2. Literature and Previous Work: Demonstrated sound knowledge of literature in the area, and of prior work on the specific research/project problem</td>
<td>0</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>3. Impact of Research/Project: Demonstrated the potential value of solution to the research/project problem in advancing knowledge within the area of study</td>
<td>0</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>4. Solution Approach: Has applied sound state-of-the-art research/project methods/tools to solve the defined problem and has described the methods/tools effectively</td>
<td>0</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>5. Results: Analyzed and interpreted research/project results/data effectively</td>
<td>0</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>6. Quality of Written Communication: Communicates research/project results clearly and professionally in written form</td>
<td>0</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>7. Quality of Oral Communication: Communicates research/project results clearly and professionally in oral form</td>
<td>0</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>8. Thinking: Has demonstrated capability for independent research/project in the area of study and expertise in the area</td>
<td>0</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>9. Broader Impact: Demonstrated awareness of broader implications of the concluded research/project. Broader implications may include social, economic, technical, ethical, business, etc. aspects.</td>
<td>0</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>10. Publications: Journal, conference, or some other scholarly publications have resulted (or are anticipated) from this research/project</td>
<td>0</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>11. OVERALL, My rating of the Thesis indicates that it:</td>
<td>0</td>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>
Appendix B. WRE Graduate Assessment Summary for AY 2020

MS degree

Overview

The sections that follow summarize the learning outcomes achieved by graduates of the WRE degree program in AY 2020 in the areas of scholarship, knowledge, communication and service, ethics and diversity.

Results of final examination

Graduate assessment checklists were provided to advisors of graduates in the WRE degree program in the 2018 academic year. Four checklists were returned to the program office with outcome-specific and overall assessment of the students’ performance at the defense. Results indicated that students met or exceeded expectations in all categories (See Appendix A). With respect to Overall rating of the thesis (outcome 11), all students either met or exceeded expectations.

Graduate Assessment of Learning Outcomes

The Water Resources Engineering Program Assessment Plan describes the following overarching learning outcomes for students in the graduate program:

“…students will gain an advanced understanding of water resources engineering. Students will be sufficiently trained through disciplinary coursework and research experience to bring hydrologic engineering expertise to a team, and will have the breadth in water resources and environmental issues to be able to communicate with professionals from the broad range of specialties involved in water resources management and research."

SCHOLARSHIP

Program graduates demonstrated mastery and application of critical thinking that extends knowledge in water resources engineering by designing and conducting their thesis or project research and presenting results of this research at their final examination.

KNOWLEDGE

By successfully completing the coursework required for the degree program, designing, conducting and presenting the results of a research project, and completing their thesis or project paper, program graduates demonstrated in-depth disciplinary knowledge and the capacity to apply that knowledge to a water resource issue. Graduates of the WRE program met the coursework requirements to gain Professional Hydrologist certification through the American Institute of Hydrology (AIH). With respect to knowledge benchmarks, all graduates passed their preliminary qualifying exam. All students enrolled in the WRE degree program maintained a graduate GPA of over 3.0.

COMMUNICATION & SERVICE

Program graduates have all demonstrated the ability to present the results of their research by completion of assignments in the core course WRP 524; or by presenting at the Water Resources Research Symposium held at OSU in May, and by presenting their work at professional meetings.

ETHICS AND DIVERSITY

Graduates of the WRE degree program receive training in ethics through research methods courses, the core course WRP 524, online training in ethics through OSU Office of Research Integrity. Students are also encouraged to participate in activities honoring diversity and multiculturalism such as the annual MLK Birthday Celebration.