FNR 5072: Environmental Education Program Development
University of Florida

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Class meets synchronously Wednesday 6:15 – 8:10 pm EST as often as we choose
and asynchronously on Canvas
Fall 2021

Good environmental education (EE) programs are designed to meet environmental and educational goals for specific audiences. They use appropriate teaching strategies to engage learners and build capacity to resolve environmental issues. The development of a good program includes: a comprehensive needs assessment to understand the audience and available resources; a pretest of the materials prior to full-scale implementation; a training program for staff or volunteers; and an evaluation procedure to continue improving the program. This course will introduce students to these techniques of program development for adult and youth-based environmental education activities in the non-formal arena (such as nature centers, extension, residential facilities, environmental organizations, and resource agencies). Students will be able to select assignments to help them develop the skills and information they wish to explore: program design, program evaluation, evaluation tool development, or literature review of a current issue. Depending on your interests, it may be possible to work in pairs on some assignments.

Course Description:
A comprehensive approach to program development, from needs assessment to evaluation, will be applied to non-formal environmental education.

Materials:

- Readings on Canvas and UF Library reserve –*https://ares.uflib.ufl.edu/*– and Perusall
- *Evaluating Your Environmental Education Programs* – Order from *naaee.net/publications*.
- *Guidelines for Excellence in EE: Materials (171B04003) and Nonformal Programs* (171B04001) – Order from USEPA *http://www.epa.gov/nscep/index.html or https://www.epa.gov/nscep* if you want a paper copy.

Course Policies:
Students are expected to complete readings, engage in discussion, and submit assignments on time. Given the potential conflicts between distance courses and full-time employment, travel for conferences, and other challenges, I anticipate you will be able to predict when you have scheduled trips and complete coursework in advance. When conflicts arise, please communicate as soon as possible to discuss how you will complete assignments. The most critical component will be online discussions and any group exercises. It will be important to keep up to date. Assignments are to be turned in each Sunday evening. Discussion of readings will occur in-person or online; we can decide what works for everyone. Comments are due in Perusall for all readings by Monday at 8:00 AM EST.

Grading Scale:

A	93 – 100%	C	73 – 76%
A-	90 – 92%	C-	70 – 72%
B+	87 – 89%	D+	67 – 69%
B	83 – 86%	D	63 – 66%
B-	80 – 82%	D-	60 – 62%
C+	77 – 79%	E	below 59%

Grades will be determined from these assignments for a total of 100 points:

1. Participation	25	
2. Midterm	15	
3. EE Proposal	20	
4. Select from below for 40 points:		
a. Program Evaluation Option		40
b. Program Development Option		40
c. Assisting Program Eval/Develop	20	
d. Issue Paper		20
e. Literature Review/Analysis		40
f. Other options are negotiable		

University of Florida Policies

Grades and Grade Points
For information on current UF policies for assigning grade points, see https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Absences and Make-Up Work
Requirements for class attendance and make-up exams, assignments and other work are consistent with university policies that can be found at: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx.

Academic Honesty
As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: *"We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity."* You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied: *"On my honor, I have neither given nor received unauthorized aid in doing this assignment*."
The Conduct Code specifies a number of behaviors that are in violation of this code and the possible sanctions. Click here to read the Conduct Code. If you have any questions or concerns, please consult with the instructor or TAs in this class.

It is assumed that you will complete all work independently unless I have asked you to collaborate on course tasks (e.g., project). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel.

Canvas Technology Requirements (Fall 2021)
Computers, Internet, and Web browsers: Canvas runs on Windows, Mac, Linux, iOS, Android, or any other device with a modern web browser. It is recommended to use a computer less than five years old with at least 1GB of RAM. It is recommended to have a minimum Internet speed of 512kbps. It is strongly recommended to not use a wireless connection, phone, tablet, or notepad for critical course tasks such as exams and discussions.

Canvas currently supports the following browsers: Chrome, Safari, Firefox, Edge. Canvas supports the last two versions of most browsers. It is highly recommend updating to the **newest version** of whatever browser you are using. Note that your computer's operating system may affect browser function. Failure to use one of these browsers will cause problems.

For more information on approved computers and browsers please visit: https://community.canvaslms.com/t5/Canvas-Basics-Guide/What-are-the-browser-and-computer-requirements-for-Canvas/ta-p/66 On this web page there is an area titled "Is My Browser up to Date?" Use it to check each computer and browser you may use in this course. There is another important area on "Browser Privacy Settings." Read the section(s) for any browser intended for use. For example, **Note that**: In browsers such as Safari, insecure content will never be displayed in the browser. Return to the page to check for updates on technology issues in Canvas.
If you encounter technical difficulties in this course, **contact the UF Computing Help Desk** right away to troubleshoot. https://helpdesk.ufl.edu/ or (352) 392-HELP. If the problem cannot be fixed immediately, **notify your instructor, and provide them with the Help Desk ticket number.**

Plagiarism
Plagiarism is using other's words without appropriate citation in your writing. It is perfectly and importantly appropriate to reference other's ideas, but you must do so with citations (to credit their ideas in your words) or quotations (to use their words). In this class, an author-date citation is fine, with a Literature Cited section listed alphabetically with enough information to find the source: author, date, title of paper or book, title of journal or website, publisher, page or website. You can find more information about plagiarism here: http://www.uflib.ufl.edu/msl/07b/studentplagiarism.html. We will be using TurnItIn software to check for plagiarism. You can use their site to check your own work before you submit it.

References to periodical articles must include the following elements: author(s), date of publication, article title, journal title, volume number, issue number (if applicable), and page numbers.
More information about APA Citation style can be found here:

- Purdue Owl Writing lab https://owl.purdue.edu/owl/research_and_citation/apa_style/apa_formatting_and_style_guide/in_text_citations_the_basics.html

Examples of how to cite various sources:

Newspaper article, online
Hu, W. (2021, June 4). Whose Streets? The Next New York Mayor Will Have to Decide. *The New York Times*. https://www.nytimes.com/2021/06/04/nyregion/nyc-mayor-election-streets.html?action=click&module=Top%20Stories&pgtype=Homepage

Journal Article
Monroe, M. C., Plate, R. R., Oxarart, A., Bowers, A., & Chaves, W. A. (2019). Identifying effective climate change education strategies: a systematic review of the research. *Environmental Education Research*, *25*(6), 791-812.

Software Use:
All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

Campus Helping Resources
Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

Health and Wellness

- *U Matter, We Care*: If you or someone you know is in distress, please contact umatter@ufl.edu, 352-392-1575, or visit U Matter, We Care website to refer or report a concern and a team member will reach out to the student in distress.
- *Counseling and Wellness Center*: Visit the Counseling and Wellness Center website or call 352-392-1575 for information on crisis services as well as non-crisis services.
- *Student Health Care Center*: Call 352-392-1161 for 24/7 information to help you find the care you need, or visit the Student Health Care Center website.
- *University Police Department*: Visit UF Police Department website or call 352-392-1111 (or 9-1-1 for emergencies).
- *UF Health Shands Emergency Room / Trauma Center:* For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road,
- Gainesville, FL 32608; Visit the UF Health Emergency Room and Trauma Center website.

Academic Resources

- *E-learning technical support*: Contact the UF Computing Help Desk at 352-392-4357 or via e-mail at helpdesk@ufl.edu.

- *Career Connections Center*: Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.
- *Library Support*: Various ways to receive assistance with respect to using the libraries or finding resources.
- *Teaching Center*: Broward Hall, 352-392-2010 or to make an appointment 352- 392-6420. General study skills and tutoring.
- *Writing Studio:* 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.
- *Student Complaints On-Campus*: Visit the Student Honor Code and Student Conduct Code webpage for more information.
- *On-Line Students Complaints*: View the Distance Learning Student Complaint Process.

Services for Students with Disabilities
The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues. Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center. Click here to get started with the Disability Resource Center. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

Technical Assistance:
Please contact sfrc-online@ifas.ufl.edu if you have difficulty reaching the Canvas site, readings, or discussions. The best way to reach them, however, is through the Technical Help site on Canvas. For evening and weekend assistance, please visit the helpdesk website or call 352-392-4357.

Course Evaluation Process
Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

Free Speech Rights and Responsibilities
Although students have free speech rights under the United States Constitution, in academic and other workplaces those rights are limited when they infringe upon another person's right to work in an environment free of harassment. In this class it is my intent to establish an environment that supports all students and their opinions and perspectives, allows for the scholarly exchange of ideas, and creates a sense of respect for all.

In-Class Recording
Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A "class lecture" is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To "publish" means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

Course Objectives

By the end of the relevant class, students will be able to:

Describe the roots of environmental education in the U.S.
Explain how social and political influences continue to shape EE in the U.S.

Describe the strategies and guidelines for EE materials and program development that should lead to excellence in EE.

Explain how people learn information, concepts, and skills.

Explain current challenges and opportunities in education and the impacts they are/may have on EE.
Understand the role of state standards and testing in education reform.

Explain the component of a logic model.
Develop a logic model that describes an EE program.
Develop program and behavioral objectives.

Describe the advantages, disadvantages, and purposes of five evaluation tools.
Create items for evaluation tools for different types of evaluation.
Explain the qualities of a good survey or interview question.

Explore the appropriate role of behavior change goals in educational programs.

Create a program proposal that meets a need and the funding guidelines described in a proposal request.
Develop logic model, objectives, program description, evaluation plan, letters of support, budget for your program.

Describe bias and explain why environmental and industry groups may be accused of it in educational programs.

Explore current issues in environmental education and explain what the value of various perspectives.
Explain the role of citizen science and social learning in adult education and conservation programs.
Explain opportunities for civic education, systems thinking, and action competence in developing 21st century skills.
Explore opportunities in EE to enhance diversity, equity, inclusion and justice.

Enhance environmental education skills by conducting an evaluation or completing portions of an evaluation for practice.

Schedule

Each week begins on Monday. If we meet concurrently, we will decide when and how, though Wednesdays are indicated on this chart to match our assigned date. Please comment on readings in Perusall by Sunday evening so I can prepare discussions for Wednesday evenings. All assignments are due Sunday before midnight, your time.

Wk	Class	Themes	Engage Online	In-person Discussion
1	8/25	Intro, History	Review Syllabus	Orientation to the course and background for EE
2	9/1	What EE is and isn't Guidelines for Excellence EE vs Science Ed EE vs ESD	Comparing EE to science ed, nature study, ESD Using Guidelines in program development	
3	9/8	How people learn How we should teach Schools & Standards Project-based Learning	Schools and Standards exercise	Discuss readings wks 1-3
4	9/15	Logic Model Program Development SMART Objectives	Develop logic model and objectives for a program, post and critique	
5	9/22	Eval Plans and Tools (embedded, survey, interview, focus group, observation)		Discuss readings wks 4-5 Critique tools in Guide to Assessing Connection to Nature
6	9/29	Critiquing tools	Develop, post and critique draft evaluation tools	
7	10/6	Changing Behavior		Discuss readings wks 6-7 Explore strategies for changing behavior
8	10/13	Midterm Due Oct 17	Submit take home midterm	
9	10/20	Writing Proposals		Discuss reading and explore options for your proposals
10	10/27	EE Issues	TBD And answer project questions	
11	11/3	EE Issues		TBD And answer proposal questions
12	11/10	EE Issues Proposal due Nov 14	TBD And answer questions	
13	11/17	EE Issues		TBD And answer questions
14	11/24	Thanksgiving – no class	---	---
15	12/1	EE Issues	TBD	
16	12/8	Share reports and projects		Everyone present on their project or proposal

Assignments

1. Participation	25 (5 - leading discussion; 11 - Perusall comments; 9 - general)	
2. Midterm	15	Due Oct 17
3. EE Proposal	20	Due Nov 14
4. Select from below for 40 points:		
a. Program Evaluation Option	40	Due Dec 8
b. Program Development Option	40	Due Dec 8
c. Assisting Program Eval/Develop	20	Due Dec 8
d. Issue Paper	20	Due Nov 24
e. Literature Review/Analysis	40	Due Dec 8
f. Other options are negotiable		

Graduate students come to this course with varying amounts of experience in environmental education. Some are employed as environmental educators and want to advance their existing knowledge and skills, while others are new to environmental education. We also have students who are interested in environmental education research and completing a thesis or dissertation on related education and communication topics. To help everyone achieve their goals, this course has a core of common readings, a take-home midterm, and one assignment, and a suite of options that can be used for the remaining points. If this collection doesn't meet your needs, please set up a time to talk to me about what would be more ideal. It may be possible to "mix and match" options.

1. Participation – All students are expected to engage in discussions of the readings. These discussions are planned for the biweekly in-person classes, but this could change if you wish. Timely and thoughtful contributions in these discussions and with the online posts and exercises will earn you points toward participation. You will earn a portion of these points by making at least 1 comment and raising at least 1 question per reading by Sunday night in Perusall. Discussion leaders and I will use your questions and comments to frame our interaction and discussion. Five points will be earned by facilitating discussion around one of the current issue topics on weeks 10-13 and 15. You are welcome to choose the topic and choose the date; we'll adjust the due dates of the readings to match. 25 points.

    Discussion Topics represent current issues in EE: Citizen Science, Social Learning, Systems Thinking, Diversity/Equity/Inclusion, and Action Competence/Civic Education. Other topics are possible. You may team up and do this as a group assignment as there are 5 open dates for these discussions.

2. Midterm – A take-home midterm will be assigned during week 8, due October 17. It will be available October 10. 15 points

3. EE Proposal -- Writing project proposals is essential to obtain funding to support EE programs. The act of writing a proposal is also a wonderful review of program development and evaluation concepts, which makes it an ideal substitute for a midterm. Develop an idea for a project that meets the priorities of an agency that funds EE programs. The workbook Writing an Environmental Education Proposal provides descriptions of agency priorities, along with several exercises and examples to help

you develop a successful proposal. This exercise will incorporate much of what we have discussed about program development, logic models, objectives, evaluation, training, learning, etc. You can dream up the organization or use a real one. You will write the budget, letters of support, and justification for the program. You will have a chance to discuss your proposal ideas on the discussion board to get class feedback. Submit your final proposal on Nov 14 and post the summary page for everyone to read. 20 points

4. Select from below for 40 points:

a. Program Evaluation Option – 40 points. Practitioners may wish to evaluate an existing program. You will describe the program, create a logic model and evaluation plan to guide your work, develop and pilot test evaluation tools and use them to collect data from a target population. You will also analyze that data and create a report. Those who select this option will meet together to share experiences, ask questions, and get assistance. Use weeks 4, 5, and 6 to work on your evaluation and get help from everyone. You will need to collect data between Oct 15 and Nov 15 to have time to finish your analysis by the end of the term. Final report is due Dec 8.

b. Program Development Option – 40 points. This is very similar to the Evaluation Option, but the program doesn't exist yet. You will conduct a needs assessment and resource analysis to determine what type of program may be most useful. You will also meet with others to get advice and ask questions. Use weeks 4, 5, and 6 to work on your needs assessment and get help from everyone. You will need to collect data between Oct 15 and Nov 15 to have time to finish your analysis by the end of the term. Final report is due Dec 8.

c. Assisting Program Eval/Develop – 20 points. You don't have a program to develop or evaluate, but you want to develop these skills. Through the magic of zoom and a willing partner, you'll be able to assist someone who is evaluating or developing a program. You will help pilot test a tool, conduct interviews, and analyze data. Depending on who you help, you may be able to do quite a bit of work, so the point value may be negotiable. A final joint report is due Dec 8.

d. Issue Paper – 20 points. To help round out the workload, those who are assisting with an evaluation project will also write a 4-6 page literature review using at least 4 current (post 2000) research papers. You may write the paper as if you are communicating with EE practitioners, summarizing what they need to know about this topic (see Across the Spectrum (naaee.net/publications/acrossthespectrum) for models). Or you may use this opportunity to write a fact sheet for EDIS (see McIntosh and Gommerman). You should review, explain, and critique a current issue in environmental education. Due whenever it is convenient, given your workload, but at least by Thanksgiving.

e. Literature Review/Analysis – 40 points. Those who are preparing to do research may appreciate an opportunity to dive into a current issue in EE that is of interest to you and make a significant and scholarly contribution to the field. This could take the form of writing an article (perhaps following the model of Duvall and Zint) or the lit review section of your thesis or dissertation. Please meet with me to review options of interest. See Duvall, J. and M. Zint. 2007. A review of research on the effectiveness of environmental education in promoting intergenerational learning. *Journal of Environmental Education* 38(4): 14-24. Due Dec 8.

Assigned Readings

Readings marked with * are in Perusall and your additional comments count toward participation.

Week 1 Introducing EE: History and Goals

*Biedenweg K., Monroe, M.C. and Wojcik, D.J. 2016. Foundations of Environmental Education, pp 9-28, in Monroe, M.C. and M. E. Krasny (eds), *Across the Spectrum: Resources for Environmental Educators.* Washington DC: NAAEE. http://naaee.net/publications/acrossthespectrum

Week 2 What is EE?

*Ginger Potter (2009) Environmental Education for the 21st Century: Where Do We Go Now?, The *Journal of Environmental Education*, 41:1, 22-33, DOI: 10.1080/00958960903209975

*Monroe, M.C. 2012. The co-evolution of ESD and EE. *Journal of Education for Sustainable Development.* 6(1): 43-47.

*NAAEE, Guidelines for Excellence: EE Materials and NonFormal Programs. Comment on the versions in Perusall; you can also order your own from the National Service Center for Environmental Publications (NSCEP) at http://www.epa.gov/nscep/
171B04001 - Nonformal Environmental Education Programs: Guidelines For Excellence
171B04003 - Environmental Education Materials Guidelines For Excellence

For Background

Hungerford, Harold R., R. Ben Peyton, Richard J. Wilke. 1980. Goals for Curriculum Development in Environmental Education, *Journal of Environmental Education*. 11:3, 42-47.

Stapp, W. B. et al. 1969. The concept of environmental education. Journal of Environmental Education, 1:1, 30-31. 10.1080/00139254.1969.10801479

Jickling, B. 1992. Why I don't want my children to be educated for sustainable development, *Journal of Environmental Education*, 23(4): 5-8.

Simmons, B., Y. Bhagwanji, and R. Ribe. 2016. Promoting excellence in environmental education, pp. 85-112. In Monroe, M.C. and M. E. Krasny (eds), *Across the Spectrum: Resources for Environmental Educators.* Washington DC: NAAEE. http://naaee.net/publications/acrossthespectrum

Week 3 Learning and Teaching

*Jacobson, S., M. McDuff, and M. C. Monroe. 2015. Chapter 2 Learning and Teaching with Adults and Youth. *Conservation Education and Outreach Techniques*. Oxford University Press. pp 35-62.

*Stern, Marc. J., Robert B. Powell & Dawn Hill (2014) Environmental education program evaluation in the new millennium: what do we measure and what have we learned?, Environmental Education Research, 20:5, 581-611, DOI: 10.1080/13504622.2013.838749

*Kuo, Ming, M. Barnes, and C. Jordan. 2019. Do experiences with nature promote learning? *Frontiers in Psychology*, 10: 1-9.

Week 4 Logic Model and Program Development

Ernst, J. A., M. C. Monroe, and B. Simmons. 2012. *Evaluating Your Environmental Education Program: A Workbook for Practitioners*. North American Association for Environmental Education. Chapters 1 and 2, and Appendix A.

Israel, G. 2001. Using Logic Models for Program Development. IFAS Fact Sheet. University of Florida. AEC 360. http://edis.ifas.ufl.edu/wc041

Diehl, D. C. and Galindo-Gonzalez, S. 2015. SMART Objectives. IFAS Fact Sheet. University of Florida. FCS6018. FY132700.pdf (ufl.edu)

For More Information

Logic Model Development Guide: W.K. Kellogg Foundation 2004. Battle Creek MI: Kellogg Foundation. Item #1209 when ordered from 1-800-819-9997. Or download from https://www.aacu.org/sites/default/files/LogicModel.pdf

Website from Univ of Wisconsin, Program Development and Evaluation program

Developing a logic model: https://fyi.extension.wisc.edu/programdevelopment/files/2016/03/lmguidecomplete.pdf

Week 5 Evaluation Plans and Tools

Ernst, J. A., M. C. Monroe, and B. Simmons. 2012. *Evaluating Your Environmental Education Program: A Workbook for Practitioners*. North American Association for Environmental Education. Chapters 3 and 4.

Salazar, Kunkle and Monroe. 2020. *Guide to Assessing Connection to Nature*. Washington DC: NAAEE.

*National Research Council. 2009. *Learning Science in Informal Environments: People, Places, and Pursuits*. Chapter 3, Assessment. National Academies Press, Pages 54-89. https://doi.org/10.17226/12190.

Week 6 Critique Tools

*Monroe, M. C. and A. Oxarart. 2019. Integrating Research and Education: Developing Instructional Materials to Convey Research Concepts. *BioScience*, 69(4): 282-291.

*Ardoin, N.M., M. DiGiano, J. Bundy, S. Chang, N. Holthuis, K. O'Connor. 2013. Using digital photography and journaling in evaluation of field-based environmental education programs. Studies in Educational Evaluation 41: 68-76.

Week 7 Addressing Issues, Changing Behavior

*Monroe, M.C., E. Andrews, K. Biedenweg. 2007. A Framework for Environmental Education Strategies. *Applied Environmental Education and Communication*. 6(3): 205-216

*Schusler, T. M. 2016. Environmental action and positive youth development, chapter 8, pp 141-163. In Monroe, M. C. and M. E. Krasny (eds.) *Across the spectrum*. Washington DC: NAAEE.

*Monroe, M.C., Richard R. Plate, Annie Oxarart, Alison Bowers & Willandia A. Chaves (2017) Identifying effective climate change education strategies: a systematic review of the research, *Environmental Education Research*, DOI: 10.1080/13504622.2017.1360842

*Chawla, L. and D. Cushing. 2007. Education for strategic environmental behavior. *Environmental Education Research* 13(4): 437-452

Week 8 Take-home Midterm – online, Due Sunday October 17

Week 9 Writing Proposals

*Monroe, Li and Oxarart. Writing an Environmental Education Proposal – On Canvas

Weeks 10, 11, 12, 13, 15 will include these readings on EE Issues; order to be determined

Citizen Science

*Jordan, R. C., H. L. Ballard, T. B Phillips. 2012. Key issues and new approaches for evaluating citizen-science learning outcomes. *Frontiers in ecology*, 10(6): 307-309.

*Dickinson, J. L, J. Shirk, D Bonter, R. Bonney, R. L. Crain, J. Martin, T. Phillips, K. Purcell. 2012. The current state of citizen science as a tool for ecological research and public engagement. *Frontiers in Ecology and the Environment*, 10 (6): 291-297

Systems Thinking

*Sweeney, L. B. (2010). Systems thinking: A means to understanding our complex world. *Pegasus Communications*. Available online at https://www.leveragenetworks.com/

*Powell, R. B., Stern, M. J., Frensley, B. T., & Moore, D. (2019). Identifying and developing crosscutting environmental education outcomes for adolescents in the twenty-first century (EE21). *Environmental Education Research*, *25*(9), 1281-1299.

Social Learning

*Wals, A.E.J., N. van der Hoeven, H. Blanken. 2009. *The acoustics of social learning*. Wageningen: Wageningen Academic Publishers. Pages 5-28. http://www.ecs.wur.nl/NR/rdonlyres/E635711D-7B4D-43B6-8FE2-249B95D2349E/92733/acousticsdigital.pdf

*Schusler, T. M., D. J. Decker, & M. J. Pfeffer. 2003. Social learning for collaborative natural resource management. *Society and natural resources*. 16:4, 309-326.

Diversity/Equity/Inclusion

*Agyeman, J. 2005. Where justice and sustainability meet. *Environment*, 47(6): 10-23.

*Dawson, E. (2014). "Not designed for us": How science museums and science centers socially exclude low-income, minority ethnic groups. *Science education*, *98*(6), 981-1008.

Action Competence/Civic Education

*Jensen, B.B. and K. Schnack. 1997. The action competence approach in environmental education. *Environmental Education Research,* 3(2): 163-178.

*Simmons and Monroe – discussion paper on Civic / Environmental Education

*Hartley, J. M., K. T. Stevenson, M. N. Peterson, K. C. Busch, S. J. Carrier, E. A. DeMattia, J. R. Jambeck, D. F. Lawson, R. L Strnad. 2021. Intergenerational learning: A recommendation for engaging youth to address marine debris challenges. Marine Pollution Bulletin, 170: 112648.

Week 16 Presentations

Suggested Research Readings:

Ardoin, N. M., A. W. Bowers, N. Wyman-Roth & N. Holthuis. 2018. Environmental education and K-12 student outcomes: A review and analysis of research. *The Journal of Environmental Education,* 49:1, 1-17, DOI: 10.1080/00958964.2017.1366155

Davis E.A., Krajcik J.S. 2005. Designing educative curriculum materials to promote teacher learning. *Educational Researcher* 34: 3–14.

Heimlich, J.E. 2010. Environmental education evaluation: Reinterpreting education as a strategy for meeting mission. *Evaluation and Program Planning*, 33: 180-185.

Ernst, J. A. and M. C. Monroe. 2004. The effects of environment-based education on students' critical thinking skills and disposition toward critical thinking. *Environmental Education Research* 10:4, 507-522.

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Additional Resources **(see also Optional readings on course reserve)**

An excellent resource:

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