

<b>Fiscal Unit/Academic Org</b>	School of Earth Sciences - D0656
<b>Administering College/Academic Group</b>	Arts and Sciences
<b>Co-administering College/Academic Group</b>	
<b>Semester Conversion Designation</b>	New Program/Plan
<b>Proposed Program/Plan Name</b>	Climate Change Fundamentals
<b>Type of Program/Plan</b>	Undergraduate certificate program
<b>Program/Plan Code Abbreviation</b>	CLIMATE
<b>Proposed Degree Title</b>	Certificate in Climate Change Fundamentals

**Credit Hour Explanation**

Program credit hour requirements		A) Number of credit hours in current program (Quarter credit hours)	B) Calculated result for 2/3rds of current (Semester credit hours)	C) Number of credit hours required for proposed program (Semester credit hours)	D) Change in credit hours
Total minimum credit hours required for completion of program				12	
Required credit hours offered by the unit	Minimum			0	
	Maximum			14	
Required credit hours offered outside of the unit	Minimum			0	
	Maximum			10	
Required prerequisite credit hours not included above	Minimum			3	
	Maximum			4	

**Program Learning Goals**

Note: these are required for all undergraduate degree programs and majors now, and will be required for all graduate and professional degree programs in 2012. Nonetheless, all programs are encouraged to complete these now.

**Program Learning Goals**

- The Climate Change Fundamentals (CCF) certificate is an interdisciplinary certificate to provide a comprehensive understanding of the physical and social science of climate change for 21st century citizens.
- Upon completion of the academic certificate in Climate Change Fundamentals, learners will be better prepared to explain the causes and consequences of climate change to diverse audiences.
- Students will be better prepared to demonstrate knowledge that:
  - 1. Climate change results from both human and natural causes over different time scales, but human activity centered upon a carbon-based energy economy has been the cause of the recent warming trend over the last century.
  - 2. Climate change is having widespread, diverse impacts on ecosystems and humans that are not the same everywhere and often adversely affect the most vulnerable populations who have done the least to cause climate change.
  - 3. Sustainable adaptations and solutions to climate change require applying fact-based knowledge to decision making processes at multiple levels in their lives (individual, community, and polity).

## Assessment

Assessment plan includes student learning goals, how those goals are evaluated, and how the information collected is used to improve student learning. An assessment plan is required for undergraduate majors and degrees. Graduate and professional degree programs are encouraged to complete this now, but will not be required to do so until 2012.

Is this a degree program (undergraduate, graduate, or professional) or major proposal? No

## Program Specializations/Sub-Plans

If you do not specify a program specialization/sub-plan it will be assumed you are submitting this program for all program specializations/sub-plans.

## Pre-Major

Does this Program have a Pre-Major? No

## Attachments

- Climate Change Fundamentals support letter signed.pdf: Letter from Geography and Earth Sciences  
*(Letter from Program-offering Unit. Owner: Griffith,Elizabeth M)*
- Climate Change Fundamentals certificate - cover letter Dec 9 2022.docx: Cover Letter addressing revisions  
*(Other Supporting Documentation. Owner: Griffith,Elizabeth M)*
- Climate Change Fundamentals Certificate\_Dec 12 2022\_track\_changes.docx: Tracked Changes Proposal  
*(Other Supporting Documentation. Owner: Griffith,Elizabeth M)*
- Climate Change Fundamentals Certificate\_Dec 12 2022\_without\_track\_changes.docx: Revised Program Proposal  
*(Program Proposal. Owner: Griffith,Elizabeth M)*
- Climate Change Fundamentals Certificate\_Dec 12 2022\_without\_track\_changes with bv changes.docx: Revised Program Proposal--USE THIS ONE  
*(Program Proposal. Owner: Vankeerbergen,Bernadette Chantal)*

## Comments

- This certificate is proposed by Dept of Geography and School of Earth Sciences.  
  
Revisions are outlined in cover letter and tracked changes proposal. Revised Program Proposal is now attached. *(by Griffith,Elizabeth M on 12/12/2022 02:14 PM)*
- Please see email with NMS and SBS panels' feedback sent today by Rachel Steele. *(by Vankeerbergen,Bernadette Chantal on 10/11/2022 12:36 PM)*

**Workflow Information**

Status	User(s)	Date/Time	Step
Submitted	Griffith, Elizabeth M	07/16/2022 02:20 PM	Submitted for Approval
Approved	Griffith, Elizabeth M	07/16/2022 02:20 PM	Unit Approval
Revision Requested	Vankeerbergen, Bernadette Chantal	10/11/2022 12:36 PM	College Approval
Submitted	Griffith, Elizabeth M	12/12/2022 02:14 PM	Submitted for Approval
Approved	Griffith, Elizabeth M	12/12/2022 02:15 PM	Unit Approval
Approved	Vankeerbergen, Bernadette Chantal	12/19/2022 10:48 AM	College Approval
Pending Approval	Cody, Emily Kathryn Jenkins, Mary Ellen Bigler Hanlin, Deborah Kay Hilty, Michael Vankeerbergen, Bernadette Chantal Steele, Rachel Lea	12/19/2022 10:48 AM	ASCCAO Approval

Dear SBS and NMS Panels,

We thank you for your constructive reviews of our Climate Change Fundamentals Certificate. The primary concerns you have raised related to aspects of assessment, the capstone course requirements, and the long-term maintenance of the curriculum by the Steering Committee represent critical issues that will play key roles in how successful this new Certificate may ultimately become. We have addressed the contingencies and recommendations below and attach the revised Certificate proposal with track changes.

Please let us know if you have any further questions or concerns, and we look forward to hearing back from you.

Matt and Bryan



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**From:** Steele, Rachel <[steele.682@osu.edu](mailto:steele.682@osu.edu)>

**Sent:** Tuesday, October 11, 2022 12:19 PM

**To:** Griffith, Elizabeth M. <[griffith.906@osu.edu](mailto:griffith.906@osu.edu)>; Lower, Steven <[lower.9@osu.edu](mailto:lower.9@osu.edu)>; Saltzman, Matthew <[saltzman.11@osu.edu](mailto:saltzman.11@osu.edu)>; Coleman, Mathew <[coleman.373@osu.edu](mailto:coleman.373@osu.edu)>

**Cc:** Roup, Christina <[roup.2@osu.edu](mailto:roup.2@osu.edu)>; Ottesen, Jennifer <[ottesen.1@osu.edu](mailto:ottesen.1@osu.edu)>; Vankeerbergen, Bernadette <[vankeerbergen.1@osu.edu](mailto:vankeerbergen.1@osu.edu)>; Steele, Rachel <[steele.682@osu.edu](mailto:steele.682@osu.edu)>; Cody, Emily <[cody.50@osu.edu](mailto:cody.50@osu.edu)>; Hilty, Michael <[hilty.70@osu.edu](mailto:hilty.70@osu.edu)>

**Subject:** Climate Change Fundamentals Certificate

Good afternoon,

On September 15<sup>th</sup> and Sept. 22<sup>nd</sup>, the Social and Behavioral Sciences and Natural and Mathematical Sciences Panels of the ASC Curriculum Committee reviewed a proposal to create a certificate in Climate Change Fundamentals.

I am happy to report that proposal was unanimously approved by both Panels.

1. The SBS Panel approved the certificate with **2 contingencies** and *3 recommendations*:

1. **Contingency:** The Panel asks that the units provide more information about how students will complete the poster project requirement. Specifically, they are interested in whether this is an element that is included in all capstone courses, or if students must complete this requirement outside of class in some or all cases. They also ask that the units include information about this requirement on the Certificate Advising Sheet (Appendix A, pg. 15).

**In our assessment plan, we have removed reference to a poster requirement. We are not requiring a separate element in addition to the Capstone project, but we are requiring students to submit their Capstone projects to a repository that can be reviewed asynchronously by the Steering Committee and utilized for our assessment as well as made available to future students as examples. At the start of the Capstone course the students enrolled in the Certificate will be reminded that their final capstone project will fulfill the expectations of the Certificate. This reminder will prompt them to consider the Certificate's third learning outcome: "Sustainable adaptations and solutions to climate change require applying fact-based knowledge to decision making processes at multiple levels in their lives (individual, community, and polity)."**

**Upon successful completion of the Capstone class we are also requiring students to fill out an online evaluation form that asks them to: 1) describe how their project met the third learning outcome (see above) and; 2) reflect on their overall experience in the Certificate program. This will give us feedback to capture recommendations that will help us to assess and improve the Certificate.**

2. **Contingency:** The Panel asks that the units denote on the Advising Sheet the courses in the Human Dimensions and Climate System Science categories which require pre-requisites outside of the certificate.

**We have added these prerequisites for courses which require pre-requisites outside of the certificate.**

3. *Recommendation:* The Panel recommends that the units consider whether the poster presentation requirement is sustainable. Given that this certificate will likely be very popular, they recommend that the units evaluate whether the Steering Committee will have the capacity to review all projects each semester.

**We agree and have removed the poster requirement. As described above, we are requiring students to submit their Capstone projects to a repository that can be reviewed asynchronously by the Steering Committee and utilized for our assessment as well as made available to future students as examples.**

4. *Recommendation:* The Panel recommends that the units add a space on the Certificate Completion Sheet (Appendix B, pg. 16) for students to denote which course they took to complete the requirement.

**We have added this space.**

5. *Recommendation:* The Panel recommends that the units adjust their materials to include Earth Science/EEOB/History 1911 as a possible Core Course in the certificate. While the Panel understands that a course change request to re-number 1911 to 2911 is currently making its way through the approval process, they note the

possibility that the certificate will be approved prior to the course change being approved and recommend that the units take this into consideration.

**We have changed 2911 to 1911 because of the uncertainty in timing of this requested course numbering change and approval.**

2. The NMS Panel approved the certificate with *3 recommendations* and 1 comment:
  1. Comment: The Panel concurs with the feedback provided by the ASCC Social and Behavioral Sciences Panel on 9-15-22.
  2. *Recommendation:* In lieu of student poster presentations serving as the primary means of collecting student feedback on the program, the Panel suggests putting together an alternative forum so that comments about the certificate do not have to circulate in such a hyper-public arena.

**We agree and have removed the poster requirement, as described above in response to the SBS Panel. The feedback on the certificate will take place with only the student and Steering Committee members via an online form, as explained above.**

3. *Recommendation:* The Panel recommends that the proposal materials explicitly state whether or not the alternative “capstone event” has to be a credit-bearing experience. If the capstone event does not have to be credit-bearing, how will the students make up/account for the remaining 3 credit hours of coursework out of the total 12 required for this certificate?

**We have clarified that the students are required to take one of the 3-4 credit hour capstone courses.**

4. *Recommendation:* The Panel kindly recommends thinking ahead to the ongoing composition, continuity, and governance structure that this undergraduate certificate will require. For instance, there is mention of a steering committee in the proposal materials, but there is no indication re: how any future members might be appointed or cycled on/off the committee in the future. How will the departments ensure that there are ready and able people actively serving on the committee?

**We thank the Committee for this recommendation. We have clarified in the proposal that the terms of Steering Committee members are 3 years with potential for renewal. Department Chairs/Directors will be asked to recommend faculty members 6 months prior to the end of a Steering Committee members term.**

I will return the certificate proposal via curriculum.osu.edu to enable the department to address the points above. Should you have any questions about the feedback above, do not hesitate to contact Christina Roup or Jennifer Ottesen (cc'd here), faculty Chairs of the SBS and NMS Panels (respectively), or me.

My best,  
Rachel



**Rachel Steele, MA**

(Pronouns: she/her/hers / Honorific: Ms.)

Program Manager, Office of Curriculum and Assessment

**College of Arts and Sciences**

306 Dulles Hall 230 Annie and John Glenn Ave. Columbus, OH 43210

# **Climate Change Fundamentals (CCF): Interdisciplinary Undergraduate Certificate Program**

**December 9, 2022**

## **Faculty Leads:**

Matthew Saltzman, School of Earth Sciences (saltzman.11@osu.edu)

Bryan Mark, Department of Geography (mark.9@osu.edu)

## **Steering Committee:**

Ellen Mosley-Thompson, Dept Geography

Gil Bohrer, Dept Civil, Environmental, and Geodetic Engineering

Maria Conroy, Knowlton School, City and Regional Planning

Kathi Kemper, College of Medicine

Jim Hood, Dept Evolution, Ecology and Organismal Biology

Matt Hamilton, School of Environment and Natural Resources

Robyn Wilson, School of Environment and Natural Resources



## ASC RULES GOVERNING CERTIFICATES

1. A certificate consists of a minimum of 12 semester credit hours. Certificates requiring 21 or more credit hours must be approved by the Ohio Department of Higher Education (ODHE). *[May be revised.]*
2. Embedded certificates are awarded by the college. Stand-alone certificates are awarded by the university.
3. Prerequisites should be none or few. Any necessary prerequisites should be clearly spelled out in the curricular proposal and on the advising sheets.
4. “Arranged” courses and individual study courses cannot be applied to a certificate.
5. Course grades below a C- will not be included among courses applied toward the certificate. The minimum overall cumulative point-hour ratio of the certificate courses must be 2.00 for undergraduate certificates, 3.00 for graduate certificates.
6. A maximum of 50% overlap between a certificate and a degree program is permitted.
7. All courses applied toward the certificate must have been taken at Ohio State.
8. Embedded certificates must be declared at least one term prior to a student’s intended graduation term, and students are encouraged to file the certificate program earlier whenever possible.

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## PROPOSAL GUIDELINES

1. Introductory Certificate Information
  - Name of proposed certificate. **Climate Change Fundamentals**
  - Identify certificate type from certificate grid (e.g., Type 2, stand-alone post-bachelor undergraduate certificate). **Type 1a, 1b (undergraduate embedded and stand-alone), and 2 (undergraduate post-bachelor standalone).**
  - **Type 1a** is a stand-alone post-secondary undergraduate academic certificate that students currently enrolled at another university would be able to take.
  - We will offer the new program as a **Type 1b** certificate as well. We expect the majority of students who complete the certificate to do so during their OSU baccalaureate experience.
  - We also request that this be a **Type 2** certificate since we expect that some individuals who already hold a baccalaureate degree could wish to enroll in order to enhance their professional development and credentials.
  - Indicate whether the certificate will be delivered wholly on-line, wholly in-person, a combination, or with all hybrid courses. **Wholly in-person**
  - Proposed implementation date. **Fall 2022**
  - Academic units (e.g., department, college) responsible for administering the certificate program. **Earth Sciences and Geography, Arts and Sciences**
    - If the certificate is co-administered, provide information about the steering committee and its functions, including meeting frequency.

- **Steering Committee will have 1-2 meeting per semester to address maintenance of the curriculum (i.e., courses to add or remove), external factors (e.g., the new GE transition or changes in Certificate types), help advocate for faculty, staff and students involved in the curriculum (e.g., team teaching across Colleges, advising, community building); and innovate for the future. The members of the Steering Committee will represent units across the University who are involved in the course offerings. Currently this includes Ellen Mosley-Thompson, Dept Geography, Gil Bohrer, Dept Civil, Environmental, and Geodetic Engineering, Maria Conroy, Knowlton School, City and Regional Planning, Kathi Kemper, College of Medicine, Jim Hood, Dept Evolution, Ecology and Organismal Biology, Matt Hamilton, School of Environment and Natural Resources, Robyn Wilson, School of Environment and Natural Resources. Terms of members are 3 years with potential for renewal. Department Chairs/Directors will be asked to recommend faculty members 6 months prior to the end of a Steering Committee members term.**
- **Indicate how the steering committee chair is chosen. Through discussion and vote if necessary.**

## 2. Rationale

- Describe the rationale/purpose of the certificate.

**Climate change is a defining issue of our time, and there is an increased need for understanding and evaluating information on local to global scales that motivates us as educators. This is a direct result of climate change becoming an operational factor in agriculture, municipal planning, defense, insurance, and other industries. The development of renewable energies and carbon management are growing in importance to the global economy. As the impacts of climate change increase in visibility and significance, this demand will continue to grow.**

**Ohio State has a significant strength in climate change, but no exclusive departmental or degree home. This certificate will guide students through a coherent set of undergraduate coursework that prepares them to pursue careers that address climate change and will demonstrate this qualification to prospective employers**

**The purpose of this certificate is to educate our 21<sup>st</sup> century citizens in climate literacy. We aim to guide students from all majors through a rigorous series of courses and experiential learning opportunities that give a foundation for understanding and engaging with the science of climate change and the human natural system. Because citizenship implies responsibility, the certificate will emphasize learning outcomes that will equip students to work towards designing sustainable solutions and informing societal adaptations.**

- Identify a likely source of student demand for the proposed certificate and provide one or two examples.

**There will be demand from a wide range of students who will have interests in the topic based on their majors situated in both physical and social sciences, as well as engineering, communication, business, public policy, and law.**

**Those students majoring in programs that offer classes in the topics of the curriculum will be motivated to complete such a certificate with a minimum of extra courses.**

For example, a student majoring in any of the following will be able to complete the certificate with 2 additional courses with strategic choices within the major:

- School of Earth Sciences
  - Department of Geography
  - Department of Civil, Environmental and Geodetic Engineering (CEGE)
  - School of the Environment and Natural Resources (SENR): Environment, Economy, Development, and Sustainability major (interdisciplinary between SENR and Agricultural, Environmental, and Development Economics (AEDE))
- Provide the following statement: **Upon completion of the academic certificate in Climate Change Fundamentals, learners will be better prepared to explain the causes and consequences of climate change to diverse audiences.** <list a maximum of 3 outcomes (goals)>.

**Students will be better prepared to demonstrate knowledge that:**

1. **Climate change results from both human and natural causes over different time scales, but human activity centered upon a carbon-based energy economy has been the cause of the recent warming trend over the last century.**
  2. **Climate change is having widespread, diverse impacts on ecosystems and humans that are not the same everywhere and often adversely affect the most vulnerable populations who have done the least to cause climate change.**
  3. **Sustainable adaptations and solutions to climate change require applying fact-based knowledge to decision making processes at multiple levels in their lives (individual, community, and polity).**
- Provide an assessment plan.
    1. If not the chair of the steering committee, who will be responsible for annual assessment of the certificate?

**Assessment results will be examined biannually by the Steering Committee. Success in the learning outcomes identified above, especially ELO's #1 and 2, will be measured with anonymous and ungraded pre-test and post-test surveys in our introductory courses (EARTHSC/HIST/EEOB 1911, GEOG 3900, GEOG 3901H).**

**These questionnaires are based upon nationally recognized science standards of climate literacy as compiled in surveys by the Yale Program on Climate Change Communication, and we will compare the outcomes from pre-tests and post-tests to demonstrate levels of learning (using rubric in Appendix E).**

**Since all certificate students will complete a capstone experience (either as a course selected from list provided, or by Steering Committee approval) that involve a project addressing some adaptation or solution requiring applying fact-based knowledge to advise decision making at some level (i.e., ELO #3), their respective capstone project final presentations will provide a moment to assess outcomes of the certificate program. If students are enrolled in an approved capstone course, their final class project can be used as the final certificate project. We are requiring students to submit their Capstone projects to a repository that can be reviewed asynchronously by the Steering Committee and utilized for our assessment as well as made available to future students as examples.**

At the start of the Capstone course the students enrolled in the Certificate will be reminded that their final capstone project will fulfill the expectations of the Certificate and prompts them to consider the Certificate's third learning outcome: "Sustainable adaptations and solutions to climate change require applying fact-based knowledge to decision making processes at multiple levels in their lives (individual, community, and polity)."

Upon successful completion of the Capstone class we are also requiring students to fill out an online evaluation form that asks them to: 1) describe how their project met the third learning outcome (see above) and; 2) reflect on their overall experience in the Certificate program. This will give us feedback to capture recommendations that will help us to assess and improve the Certificate.

### 3. Relationship to Other Programs / Benchmarking

- Identify any overlaps with other programs or departments within the university. Append letters of concurrence or objection from related units.

**While there are many courses and experiences available to Ohio State students that relate to climate change, there is not a specific credentialed pathway to guide students. Therefore, we propose a new climate change certificate that will integrate course options from multiple disciplines into a cohesive interdisciplinary certificate. This will require collaborating with relevant discipline-specific faculty to coordinate the development of a program that can be accessed by all OSU students to enhance their existing degree program.**

Several units have specializations within their degree programs which cover one or more elements of climate change, but these are not inherently cross-disciplinary by virtue of the fact that they reside in units. The certificate therefore blends interdisciplinary courses that for most part already exist in other undergraduate programs at Ohio State. For example, the BS in Earth Sciences has a Subprogram in Climate, Water and Environment (CWE) that includes a requirement for two climate classes, several of which are also on our list of foundational or advanced courses. However, the CWE Subprogram is distinct in requiring a foundation course (EARTHSC 4450) that examines Water, Ice and Energy in the Earth System. The CWE does not require any courses in Human-Natural Systems (it does require a single 'Sustainability' course), which students would be required to take in our Certificate.

Similarly, there are minimal course overlaps with the BA/BS in Geography, and the BS in Atmospheric Sciences. The School of the Environment and Natural Resources (SENR) and Agricultural, Environmental, and Development Economics (AEDE) have a shared interdisciplinary program called EEDS – Environment, Economy, Development and Sustainability, which has minimal course overlap in the area of Climate Science. Likewise SENR offers a degree called EPDM – Environmental Policy and Decision Making, which does not require Climate Science. The SENR Environmental Science degree shares some courses in both Human-Natural Systems and Climate Science, but the foundational courses in Climate Change required in our Certificate are not required by SENR. The School of Communications offers a Certificate in Science and Environmental Communications, and Anthropology plans to offer a new SARSES (Sustainable and Resilient Social and Ecological Systems) Certificate; however, neither requires a foundational course in Climate Change.

In summary, our Certificate would complement all of the existing programs at Ohio State mentioned above in that there is growing demand for an integrated curriculum (i.e., science and human-natural systems) in climate change. We understand that the Sustainability Institute is building on our planned Climate Change Fundamentals Certificate to serve this growing demand as well with a variety of more specialized Climate Change Certificate flavors.

Appendix F includes concurrence sought from Arts & Sciences, College of Food, Agriculture, and Environmental Sciences (CFAES), College of Engineering, College of Business, College of Law, and College of Public Health.

- Indicate whether this certificate or a similar certificate was submitted for approval previously. Explain at what stage and why that proposal was not approved or was withdrawn. **This is a new proposal, no such certificate proposal has been submitted for approval previously.**

- Identify similar programs at other institutions of higher education in Ohio as well as in the United States, and their levels of success. (**NOTE:** The list of similar programs throughout the United States is not required to be comprehensive. Identify aspirational peers and/or benchmark institutions where possible.)

**There are no similar Climate Change curricular programs in Ohio that we are aware of, but there are programs in sustainability. We have examined a few certificate programs/minors addressing climate change across the country (see bulleted list below), but ours appears to be a unique, multidisciplinary approach to the field. Based on our view of other programs, we believe it is imperative that Ohio State launch a Climate Change Certificate program to allow us to compete with our peer institutions and ultimately lead in these efforts.**

- **Stanford University is launching a new School of Climate and Sustainability in Fall 2022 with new degree programs to be announced <https://sustainabilityinitiative.stanford.edu/>**
- George Mason University interdisciplinary program. <https://green.gmu.edu/academics/mason-core-engagement-series-encore/>
- Yale certificate program in climate and health: <https://ysph.yale.edu/cchcert/>
- Univ of Washington: <https://pcc.uw.edu/education/graduate-certificate/>
- Columbia University climate and health certificate: <https://www.publichealth.columbia.edu/academics/degrees/master-public-health/certificates/climate-and-health>
- Penn climate certificate: <https://catalog.upenn.edu/undergraduate/programs/climate-change-certificate/>
- Northwestern certificate program in sustainable energy: <https://catalogs.northwestern.edu/undergraduate/additional-baccalaureate-options/certificates/programs-centers-certificates/sustainability-energy/>
- Rutgers program in coastal climate risk and resilience: <https://c2r2.rutgers.edu/>
- Cornell University Climate Change minor <https://www.eas.cornell.edu/eas/programs/undergraduate-programs/undergraduate-minors/climate-change-minor>
- U Iowa certificate program: <https://catalog.registrar.uiowa.edu/university-college/sustainability/certificate/>
- University of Maryland program in Global Environmental Change <https://ensp.umd.edu/concentrations/global-environmental-change>

- University of Maryland EXTENSION: <https://extension.umd.edu/programs/environment-natural-resources/program-areas/coastal-climate-program/climate-change-maryland>
- UMN climate-HEALTH action: <https://med.umn.edu/dom/research/programs-centers/climate-health-action-program>
- University of Nebraska Minor in Applied Climate Science: <https://catalog.unl.edu/undergraduate/agricultural-sciences-natural-resources/applied-climate-science/>
- Univ Wisconsin undergrad certificate program in sustainability management: <https://sustain.wisconsin.edu/sustainability-programs/curriculum-and-courses/certificates/>
- Georgia Institute of Technology climate change minor <https://eas.gatech.edu/undergrad/climate-change-minor>

**Because these programs are new and cutting edge, little information exists on their level of success. A comprehensive review of programs was completed by Sustainability Institute and includes contact information for each program. Given the current popularity of climate change in academic and workforce discourses, we have every reason to believe that this certificate will be highly successful.**

#### 4. Student Enrollment

- Indicate the number of students you anticipate will choose to pursue this certificate. **We anticipate initial enrollment to be modest, about 25 per year across the certificate. Growth will be facilitated with outreach to the relevant populations in both Earth Sciences and Geography, as well as students in related disciplines, including EEOB, Zoology, Environmental Engineering, Environmental Science, EPDM, and EEDS. The Undergraduate Studies Committees in both Earth Sciences and Geography will advertise the certificate during student visit days, communicate the opportunity to advisors and the career center. As the design of the certificate is to take advantage of new “Theme” course threads, we anticipate that this program can be quite popular. We have the capacity for as many as 100 students a year before needing to open new sections.**

#### 5. Curricular Requirements

- Indicate the minimum number of credits required for completion of the certificate. **12**
- Indicate the number of semesters expected to complete the certificate. Confirm that courses are offered frequently enough and have the capacity to meet this expectation. **4 semesters**
- If applicable, describe existing facilities, equipment, and off-campus field experience and clinical sites to be used. Indicate how the use of these facilities, equipment, etc., will impact other existing programs. **We do not anticipate additional facility usage beyond what is accounted for in existing classes. Depending on the implementation of the capstone course, we may seek off-campus engagement with government (city, town, county, region) and non-profit decision-making entities/planners.**
- For interdisciplinary certificates, describe the way in which advising and other student support will be provided. **We anticipate Earth Sciences and Geography advising will be sufficient; however, with sustained growth in enrollments, this will be revisited annually.**
- If applicable, describe additional university resources (including advisors and libraries) that will be required for the new certificate. **A dedicated advisor who has experience with interdisciplinary curricular offerings and programs may be needed. The State Climate Office of Ohio (SCOO), with personnel in Extension, could potentially help**

**facilitate and/or administer the capstone course, which will require relationship building with government (city, town, county, region) and non-profit decision making entities/planners.**

- Provide the following in appendices.
  - ASC advising sheet for proposed certificate.
  - ASC completion sheet for certificates.
  - Semester-by-semester sample program.
  - A list of the courses (department, title, credit hours, description) which constitute the requirements and other components of the certificate. Identify prerequisite courses where relevant. Indicate which courses are currently offered and which will be new. When the new course requests are submitted through curriculum.osu.edu, indicate that those course requests are being submitted as part of a new certificate proposal. As much as possible, the curriculum committees will review the course requests in conjunction with the certificate proposal.

**Take one of the following introductory courses (3 or 4 credits)**

- EARTHSC/EEOB/HIST 2911\*: **Climate Change: Mechanisms, Impacts, and Mitigation**
- GEOG 3900: **Global Climate Change: Causes and Consequences**
- GEOG 3901H: Global Climate and Environmental Change

\*pending approval to change course number from 1911 to 2911

**Students will take one course in Human Natural Systems from the following list:**

- A 3000+ level course addresses dimensions of human behavior and decision making as it relates to natural systems and climate change. 3 credits. Select **one** of the following courses:
  - ENR 4450: **Climate Change Policy**
  - ENR 3400: Psychology of Environmental Problems
  - GEOG 3597.03: Environmental Citizenship (or English 3597.03)
  - AEDE 4320: Energy, the Environment, and the Economy
  - CRPLAN 3550: Environmental Planning and Policy for a Sustainable Future

**Students will take one course in Climate System Science from the following list:**

- A 3000+ level course that explores dimensions of Earth's climate system and human impacts, and/or methods of climate science (measurement, data analysis). 3 credits. Select **one** of the following courses:
  - ENVENG 4218: Measurement and **Modeling of Climate Change**
  - ATMOSOC 5901: **Climate System Modeling: Basics and Applications**
  - GEOG 5900: Weather, **Climate and Global Warming**
  - EARTHSC/GEOG 4911: Earth's **Climate: Past and Future**
  - ENR/EARTHSC 5268: Soils and **Climate Change**
  - PUBHEHS 4325: **Climate Change** and Human Health (online)

**Students will successfully complete a 3-4 credit Capstone experience involving group problem solving and communication of results to diverse audiences related to climate change topics as approved by the Steering Committee. This can be completed within an existing Capstone course from the following list (or Group Studies in Earth Sciences and Geography): (3 or 4 credits)**

- ENR 4900.01 Environment and Natural Resources Management Capstone
- ENR/AEDECON 4567: Assessing Sustainability: Project Experience
- PUBAFR 5620: Rapid Innovation for Public Impact (4)
- ENVENG 4090: Environmental Engineering Capstone Design
- EARTHSC/GEOG 5194: Group Studies\*

\*We are in the process of creating a new EARTHSC/GEOG Climate Change Capstone course (TBD)

## **6. Appendices**

**Appendix A: ASC Advising Sheet**

**Appendix B: ASC Completion Sheet**

**Appendix C: Semester-by-semester sample program**

**Appendix D: Course List**

**Appendix E: Assessment**

**Appendix F: Concurrence**



## Appendix A – Advising Sheet

### The Ohio State University College of Arts and Sciences

#### Climate Change Fundamentals Certificate, Type 1a, 1b; Type 2

**Advising Contact:**

Ali Grandey, Undergraduate Advisor for Geography, [grandey.4@osu.edu](mailto:grandey.4@osu.edu), (614)688-4078 and Karen Royce, Undergraduate Advisor for Earth Sciences, [royce.6@osu.edu](mailto:royce.6@osu.edu), (614)292-6961

**Faculty Contact:**

Bryan Mark, Dept of Geography; [mark.9@osu.edu](mailto:mark.9@osu.edu); and Matthew Saltzman, Sch of Earth Sciences; [saltzman.11@osu.edu](mailto:saltzman.11@osu.edu)

The Climate Change Fundamentals (CCF) certificate is an interdisciplinary certificate to provide a comprehensive understanding of the physical and social science of climate change for 21st century citizens. Upon completion of the academic certificate in Climate Change Fundamentals, learners will be better prepared to explain the causes and consequences of climate change to diverse audiences.

The CCF certificate requires a minimum of 12 credits drawn from diverse departments and distributed as follows (\*indicates that a course is listed as offered on regional campuses):

**Take one of the following introductory courses:**

EARTHSC/EEOB/HIST 1911: Climate Change: Mechanisms, Impacts, and Mitigation (4)

GEOG 3900: Global Climate Change: Causes and Consequences (3)

GEOG 3901H: Global Climate and Environmental Change (3)

**Students will take one course in Human Dimensions from the following list:**

ENR 4450: Climate Change Policy (3)  
ENR 3400: Psychology of Environmental Problems (3) Prereq: ENR 2300 or PSYCH 1100.  
GEOG or ENGLISH 3597.03: Environmental Citizenship (3)

AEDE 4320: Energy, the Environment, and the Economy (3) Prereq: AEDECON 4310  
CRPLAN 3550 Prereq: CRPLAN 2110

**Students will take one course in Climate System Science from the following list:**

ENVENG 4218: Measurement and Modeling of Climate Change (3) Prereq: CIVILEN 2060, or permission of instructor  
ATMOSSC 5901: Climate System Modeling: Basics and Applications (3) Prereq: A grade of C- or above in ATMOSSC 2940 or GEOG 5900, or permission of instructor  
GEOG 5900: Weather, Climate and Global Warming (3)  
EARTHSC/GEOG 4911: Earth's Climate: Past and Future (3)  
ENR/EARTHSC 5268: Soils and Climate Change (3)  
PUBHEHS 4325: Climate Change and Human Health (online) (3)

**Students will successfully complete a Capstone experience and present it to the Steering Committee for approval and assessment. This can be completed within an existing Capstone course from the following list:**

ENR 4900.01 Environment and Natural Resources Management (3)  
ENR/AEDECON 4567: Assessing Sustainability: Project Experience (3)  
PUBAFRS 5620 Rapid Innovation for Public Impact (4)  
ENVENG 4090  
EARTHSC/GEOG 5194: Group Studies\*\* (3)

\*\*Renumbered cross-listed Climate Change Capstone in development

**CCF Certificate Program Guidelines**

Credit hours required: A minimum of 12.

Overlap with degree program: A student is permitted to overlap up to 50% of credit hours between other degree program (major, minor,

other certificate, or general education) and the certificate program.

Grades required

- Minimum C- for a course to be counted on the certificate
- Minimum 2.00 cumulative GPA for all certificate course work.

Certificate approval: The certificate may be approved by the student's assigned academic advisor via the Degree Audit Report (DAR). If the certificate is not complete on the DAR, the student must consult with a College of Arts and Sciences advisor.

Consult with advisor for filing deadlines.

## Appendix B: Certificate Completion Sheet

### College of Arts and Sciences Climate Change Fundamentals (CCF) Certificate Program

Student Name: \_\_\_\_\_

Student OSU Email: \_\_\_\_\_

Certificate Advisor Name: \_\_\_\_\_

**Required Core Courses** (3 or 4 credits):

Course (Hours)	Course Grade	Term Completed
Pick one of the following: EARTHSC/EEOB/HIST 1911: Climate Change: Mechanisms, Impacts, and Mitigation (4) GEOG 3900: Global Climate Change: Causes and Consequences (3) GEOG 3901H: Global Climate and Environmental Change (3)		

**One course from 3 of the following categories, selected from the Climate Change Fundamentals (CCF) Certificate Advising Sheet (9-10 credits).** Fill in the name of the course selected in the table provided below:

Course (Hours)	Course Grade	Term Completed
Climate System Science course (3 credits): _____		
Human Natural Systems course (3 credits): _____		
Capstone Experience (3-4 credits): _____		

Total credits (12-14): \_\_\_\_\_

Certificate Advisor Signature: \_\_\_\_\_

Date: \_\_\_\_\_

---

## Appendix C: Semester-by-semester sample program

Plan to complete in two years

### Year 1:

**Autumn:** Either EARTHSC/EEOB/HIST 1911: Climate Change: Mechanisms, Impacts, and Mitigation (Autumn, offered annually) or GEOG 3900: Global Climate Change: Causes and Consequences (Autumn or Spring, offered every semester) or GEOG 3901H: Global Climate and Environmental Change

**Spring:** Elective – Human Dimensions or Climate System Science

### Year 2:

**Autumn** Elective – Human Dimensions or Climate System Science

**Spring:** Capstone Experience

## Appendix D: Course List

This alphabetized list indicates the many options students have for completing the CCF certificate. Listings for each course include (1) department, (2) course title, (3) credit hours, (4) brief description, (5) prerequisites, (6) whether the course is new, (7) which part of the certificate requirements the course satisfies, and (8) whether the course is offered on regional campuses.

~

AEDECON 4320: Energy, the Environment, and the Economy (3 credits). Introduces students to core economic concepts related to energy and the environment. Prereq: AEDECON 4310. New: no. Satisfies: human dimensions class. RC: no.

ATMOSSC 5901: Climate System Modeling: Basics and Applications (3 credits). An examination of climate system modeling, including their component atmospheric, oceanic, sea ice and land surface models, and their coupling, and their applications. Prereq: A grade of C- or above in ATMOSSC 2940 or GEOG 5900, or permission of instructor. New: no. Satisfies: climate system science class. RC: no.

---

CRPLAN 3550: Environmental Planning and Policy for a Sustainable Future (3 credits). This course has been designed to incorporate environmental considerations into land use planning and policy making. Upon completion of this course students should be able to analyze environmentally related planning problems not requiring in-depth environmental expertise and recognize when such expertise is necessary. Prereq: 2110. New: no. Satisfies: human dimensions class. RC: no.

EARTHSC/EEOB/HIST 1911: Climate Change: Mechanisms, Impacts, and Mitigation (4 credits). Examination of the basic science of climate change, of the ability to make accurate predictions of future climate, and of the implications for global sustainability by combining perspectives from the physical sciences, the biological sciences, and historical study. Team-taught with faculty members in EEOB and History. Prereq: none. New: no. Satisfies: introductory class. RC: no.

EARTHSC/GEOG 4911: Earth's Climate: Past and Future (3 credits). Examination of Earth's climate and its natural development as understood from the geologic record spanning the full history of the planet, as well as how the future climate is likely to evolve under ongoing human modifications. Prereq: Either EARTHSCI/EEOB/HIST 1911 or GEOG 3900. New: yes. Satisfies: climate system science class. RC: no.

EARTHSC/GEOG 5194: Group Studies (3 credits). Capstone projects involving group problem solving and communication of results to diverse audiences related to climate change topics. Prereq: permission of instructors. New: no. Satisfies: capstone experience with approved project. RC: yes.

ENVENG 4090 Environmental Engineering Capstone Design (3 credits). Culminating design course for the Environmental Engineering program. Must be taken as close to graduation as possible. Prereq: Sr standing. Not open to students with credit for 619. New: no. Satisfies capstone experience with approved project. RC: no.

ENVENG 4218: Measurement and Modeling of Climate Change (3 credits). A study of the atmospheric boundary layer, its interaction with the land surface and vegetation in particular, and hand-on experience with micrometeorological and eddy-covariance instrumentation and data analysis. Prereq: CIVILENG 2060, or permission of instructor. New: no. Satisfies: climate system science class. RC: no.

---

ENR/EARTHSC 5268 Soils and Climate Change (3 credits). Soil processes, abrupt climate change, trace gases and their properties, global C cycle, gaseous emissions, C-neutral fuels, carbon sequestration, Kyoto Treaty, trading of C credits. Prereq: none. New: no. Satisfies: climate system science class. RC: no.

ENR 3400: Psychology of Environmental Problems (3 credits). The theory and psychology behind individual and group behavior as it relates to environmental problems. Prereq: ENR 2300 or PSYCH 1100. New: no. Satisfies: human dimensions class. RC: no.

ENR 4450: Climate Change Policy (3 credits). Climate change adaptation and mitigation policy instruments and governance processes; theoretical frameworks for analysis of climate change governance. Prereq: none. New: no. Satisfies: human dimensions class. RC: no.

ENR/AEDECON 4567: Assessing Sustainability: Project Experience (3 credits). Students gain experience in sustainability assessment by applying concepts and quantitative methods to evaluate environmental, economic, social, & technical sustainability of specific projects. Prereq: ENR 2500 or AEDECON 2500, and Sr standing; or permission of instructor. Not open to students with credit for AEDEcon 4567. New: no. Satisfies: capstone experience with approved project. RC: no.

ENR 4900.01 Environment and Natural Resources Management (3 credits). Integration of technical knowledge with social and institutional constraints as they relate to professions in ENR management. Prereq: Sr standing in ENR. New: no. Satisfies: capstone experience with approved project. RC: no.

GEOG 3900: Global Climate Change: Causes and Consequences (3 credits). Examines the natural and human factors that force changes in our climate and environment and explores strategies for a sustainable environment in the future. Prereq: none. New: no. Satisfies: climate system science class. RC: no.

GEOG 3901H: Global Climate and Environmental Change (3 credits). Examines both natural and social factors that force changes in our climate and environment and explores strategies for a sustainable environment in the future. Prereq: Honors standing, or permission of instructor. Not open to students with credit for 3900. New: no. Satisfies: climate system science class. RC: no.

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GEOG/ENGLISH 3597.03: Environmental Citizenship Change (3 credits). Provides tools for environmental citizenship by teaching interdisciplinary perspectives on biophysical and sociocultural forces that shape environments. Addresses general processes through local case studies. Prereq: none. New: no. Satisfies: human dimensions class. RC: no.

GEOG 5900: Weather, Climate and Global Warming (3 credits). An introduction to the fundamental physical and mathematical principles governing both day-to-day weather and the average of weather, or climate. Objectives are to understand the physical processes of the earth-atmosphere system, describe its weather features and climate characteristics today, and outline how they might change in the future as a result of global warming. Prereq: Not open to students with credit for ATMOSSC 2940. New: no. Satisfies: climate system science class. RC: no.

PUBAFRS 5620 Rapid Innovation for Public Impact (4 credits). The Rapid Innovation for Public Impact course is like a multi-disciplinary capstone or hands-on applications course in which student teams tackle real, contemporary, complex problems sponsored by government or non-profit agencies. Following Lean Innovation methodology, student teams develop minimum viable products (MVP) or prototype-solutions through intensive customer discovery and agile design. Prereq: none. New: no. Satisfies: capstone experience with approved project. RC: no.

PUBHEHS 4325: Climate Change and Human Health (3 credits). Recognize current controversies about climate change, summarize the evidence about climate change on human health, and identify major human diseases associated with climate change. Prereq: none. New: no. Satisfies: climate system science class. RC: no.

## Appendix E: Assessment Rubric

	baseline	advanced	mastery
<b>ELO 1</b> Climate change results from both human and natural causes over different time scales, but human activity centered upon a carbon-based energy economy has been the cause of the recent warming trend over the last century.	Fails to grasp concepts of human input and natural variability	Can explain concepts of human input and natural variability	Offers detailed analysis of concepts of human input and natural variability

---

<b>ELO 2</b> Climate change is having widespread, diverse impacts on ecosystems and humans that are not the same everywhere and often adversely affect the most vulnerable populations who have done the least to cause climate change.	Fails to grasp concepts of impact of climate change	Can explain concepts of impacts of climate change	Offers detailed analysis of concepts of impact of climate change
---	---	---	--

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## Appendix F: Concurrence

### Compiled Concurrence Data for Climate Change Fundamentals (CCF) Certificate Program

The following concurrences are included below from

1. **Arts and Sciences (NMS and SBS)**
2. **College of Food, Agriculture, and Environmental Sciences (CFAES)**
3. **College of Engineering**
4. College of Business\*
5. **College of Law**
6. College of Public Health\*

\*Concurrence based on non-response

#### 1. Arts and Sciences (NMS and SBS)

##### a. School of Communications

**From:** Garrett, Kelly <[garrett.258@osu.edu](mailto:garrett.258@osu.edu)>

**Sent:** Wednesday, April 27, 2022 1:44 PM

**To:** Saltzman, Matthew <[saltzman.11@osu.edu](mailto:saltzman.11@osu.edu)>

**Subject:** RE: Concurrence Request for Climate Change Fundamentals undergraduate certificate

Prof. Saltzman,

The School of Communication provides concurrence for the Climate Change Fundamentals certificate.

Kelly

=====

R. Kelly Garrett, Ph.D.

Professor & Director | School of Communication | Ohio State University

614-292-0451 | <http://rkellygarrett.com/>

**From:** Vankeerbergen, Bernadette <[vankeerbergen.1@osu.edu](mailto:vankeerbergen.1@osu.edu)>

**Sent:** Monday, April 18, 2022 11:40 AM

**To:** \_ASC NMS Chairs Directors <[ASC-nms-chairs-directors@osu.edu](mailto:ASC-nms-chairs-directors@osu.edu)>; \_ASC SBS-Chairs <[ASC-SBS-Chairs@osu.edu](mailto:ASC-SBS-Chairs@osu.edu)>

**Cc:** Saltzman, Matthew <[saltzman.11@osu.edu](mailto:saltzman.11@osu.edu)>

**Subject:** Concurrence Request for Climate Change Fundamentals undergraduate certificate

Dear SBS and NMS Chairs and Directors,

Please find attached a proposal for a new interdisciplinary undergraduate certificate from the Department of Geography and the School of Earth Sciences: "Climate Change Fundamentals."

Both academic units are seeking concurrence for the new certificate. Please email your responses/concurrences to Professor Matt Saltzman ([saltzman.11@osu.edu](mailto:saltzman.11@osu.edu)) in the School of

---

Earth Sciences. **Responses are due within two weeks.** Concurrence will be assumed if no response is received within two weeks (May 3, 2022).

Many thanks,  
Bernadette



**Bernadette Vankeerbergen, Ph.D.**

Assistant Dean, Curriculum  
College of Arts and Sciences  
306B Dulles Hall, 230 Annie & John Glenn Ave.

## **2. College of Food, Agriculture, and Environmental Sciences (CFAES)**

### **a. School of Environment and Natural Resources (SENR)**

#### **b. CFAES – all units**

**a. SENR From:** Brooks, Jeremy S. <brooks.719@osu.edu>

**Sent:** Monday, April 18, 2022 9:14 PM

**To:** Osborne, Jeanne <osborne.2@osu.edu>; Sharp, Jeff <sharp.123@osu.edu>

**Cc:** Saltzman, Matthew <saltzman.11@osu.edu>; Vankeerbergen, Bernadette <vankeerbergen.1@osu.edu>; Martin, Andrew <martin.1026@osu.edu>

**Subject:** Re: Concurrence Request for Climate Change Fundamentals undergraduate certificate

Hi Jeanne,

SENR is supportive of this certificate and looks forward to seeing it on the books.

Best

Jeremy



**Jeremy Brooks**

#### **The Ohio State University**

College of Food, Agricultural and Environmental Sciences  
School of Environment and Natural Resources  
469D Kottman Hall  
2021 Coffey Rd, Columbus, OH 43210  
614-292-9787 Office  
[brooks.719@osu.edu](mailto:brooks.719@osu.edu) / <https://u.osu.edu/brooks.719/>

**b. CFAES – all units From:** Osborne, Jeanne <osborne.2@osu.edu>

**Sent:** Tuesday, May 3, 2022 10:39 AM

**To:** Saltzman, Matthew <saltzman.11@osu.edu>

**Cc:** Vankeerbergen, Bernadette <vankeerbergen.1@osu.edu>; Martin, Andrew <martin.1026@osu.edu>

**Subject:** RE: Concurrence Request for Climate Change Fundamentals undergraduate certificate

Dear Dr. Saltzman,

On behalf of the College of Food, Agricultural, and Environmental Sciences, please accept concurrence for the proposal for a new interdisciplinary undergraduate certificate from the Department of Geography and the School of Earth Sciences: "Climate Change Fundamentals.". This proposal has been reviewed by academic units within the CFAES, and the School of Environment and Natural Resources and Departments of Agricultural Communication, Education, and Leadership and Horticulture and Crop Science responded with concurrence.

The CFAES supports this proposal; this new certificate program may be of interest to some students within the CFAES and SENR.

Please let me know if you need any additional information.

Take care,

Jeanne



THE OHIO STATE UNIVERSITY

*Jeanne M. Osborne* | Pronouns: She, Her, Hers

Assistant Dean for Academic Affairs

College of Food, Agricultural, and Environmental Sciences

100E Agricultural Administration, 2120 Fyffe Rd.

Columbus, OH 43210

Tel: 614-292-1734

Fax: 614-292-1218

e-mail: [Osborne.2@osu.edu](mailto:Osborne.2@osu.edu)

**From:** Osborne, Jeanne <[osborne.2@osu.edu](mailto:osborne.2@osu.edu)>

**Date:** Monday, April 18, 2022 at 4:14 PM

**To:** Brooks, Jeremy S. <[brooks.719@osu.edu](mailto:brooks.719@osu.edu)>, Sharp, Jeff <[sharp.123@osu.edu](mailto:sharp.123@osu.edu)>, Gardner, David <[gardner.254@osu.edu](mailto:gardner.254@osu.edu)>, Karcher, Doug <[karcher.3@osu.edu](mailto:karcher.3@osu.edu)>, Shearer, Scott A. <[shearer.95@osu.edu](mailto:shearer.95@osu.edu)>, Chen, Qian <[chen.1399@osu.edu](mailto:chen.1399@osu.edu)>, Haab, Timothy <[haab.1@osu.edu](mailto:haab.1@osu.edu)>, Roe, Brian <[roe.30@osu.edu](mailto:roe.30@osu.edu)>, Parkman, Anna <[parkman.6@osu.edu](mailto:parkman.6@osu.edu)>

**Cc:** Saltzman, Matthew <[saltzman.11@osu.edu](mailto:saltzman.11@osu.edu)>, Vankeerbergen, Bernadette <[vankeerbergen.1@osu.edu](mailto:vankeerbergen.1@osu.edu)>, Martin, Andrew <[martin.1026@osu.edu](mailto:martin.1026@osu.edu)>

**Subject:** FW: Concurrence Request for Climate Change Fundamentals undergraduate certificate

Dear All,

---

The Department of Geography and the School of Earth Sciences is requesting concurrence for a new interdisciplinary certificate, 'Climate Change Fundamentals'. Please see the attached and the information below. Faculty members in the School of Environment and Natural Resources and the Department of Agricultural, Environmental and Development Economics have been involved in the development of this certificate proposal.

I would appreciate your response to this concurrence request by **Monday, May 2, 2022** so that I can send the response from the CFAES by the deadline requested, May 3, 2022.

Let me know if you have any questions or need additional information.

Take care,

Jeanne



*Jeanne M. Osborne* | Pronouns: She, Her, Hers

Assistant Dean for Academic Affairs

College of Food, Agricultural, and Environmental Sciences

100E Agricultural Administration, 2120 Fyffe Rd.

Columbus, OH 43210

**From:** Saltzman, Matthew <[saltzman.11@osu.edu](mailto:saltzman.11@osu.edu)>

**Sent:** Monday, April 18, 2022 12:44 PM

**To:** Osborne, Jeanne <[osborne.2@osu.edu](mailto:osborne.2@osu.edu)>

**Cc:** Vankeerbergen, Bernadette <[vankeerbergen.1@osu.edu](mailto:vankeerbergen.1@osu.edu)>; Martin, Andrew <[mar-tin.1026@osu.edu](mailto:mar-tin.1026@osu.edu)>

**Subject:** Concurrence Request for Climate Change Fundamentals undergraduate certificate

Dear Jeanne,

Please find attached a proposal for a new interdisciplinary undergraduate certificate from the Department of Geography and the School of Earth Sciences: "Climate Change Fundamentals."

Both academic units are seeking concurrence for the new certificate. Please email your responses/concurrences to me, Professor Matt Saltzman ([saltzman.11@osu.edu](mailto:saltzman.11@osu.edu)), in the School of Earth Sciences. **Responses are due within two weeks.** Per the guidelines I have been given, concurrence will be assumed if no response is received within two weeks (May 3, 2022). During the multi-year process of putting this Certificate together, we engaged with more than 40 faculty and staff across the University including many in your College (Robyn Wilson and Matt Hamilton in SENR, who are also members of our Steering Committee, and Brent Sohngen in AEDE among others). This effort was also supported by the Sustainability Education Grant Program administered by the Sustainability Institute, and we engaged with Elena Irwin throughout the process.

Please let me know if you have any questions or concerns, and I'm happy to provide any additional information.

Best, Matt



**Matthew R. Saltzman**

---

Professor  
School of Earth Sciences  
275 Mendenhall Lab, 125 South Oval Mall, Columbus, OH 43210-1398  
office 6142920481  
[saltzman.11@osu.edu](mailto:saltzman.11@osu.edu)

### 3. College of Engineering

#### a. Knowlton School of Architecture City and Regional Planning Section

#### b. Civil, Environmental and Geodetic Engineering (CEGE)

**a. From:** Quinzon-Bonello, Rosario <[quinzon-bonello.1@osu.edu](mailto:quinzon-bonello.1@osu.edu)>

**Sent:** Monday, April 25, 2022 10:50 AM

**To:** Saltzman, Matthew <[saltzman.11@osu.edu](mailto:saltzman.11@osu.edu)>

**Cc:** Tomasko, David <[tomasko.1@osu.edu](mailto:tomasko.1@osu.edu)>; Dunham-Borst, Judith <[dunham-borst.1@osu.edu](mailto:dunham-borst.1@osu.edu)>

**Subject:** FW: Concurrence Request for Climate Change Fundamentals undergraduate certificate

Hello Mathew,

Knowlton School of Architecture City and Regional Planning Section is in support of undergraduate certificate "Climate Change Fundamentals."

Thank you,

Rosie



Rosario (Rosie) Quinzon-Bonello, M.Ed.

Assistant Dean for Curriculum and Assessment

College of Engineering

122 Hitchcock Hall, 2070 Neil Ave.

Columbus, OH 43210

**From:** Dunham-Borst, Judith <[dunham-borst.1@osu.edu](mailto:dunham-borst.1@osu.edu)>

**Sent:** Friday, April 22, 2022 10:57 AM

**To:** Tomasko, David <[tomasko.1@osu.edu](mailto:tomasko.1@osu.edu)>; Quinzon-Bonello, Rosario <[quinzon-bonello.1@osu.edu](mailto:quinzon-bonello.1@osu.edu)>

**Cc:** Imbert, Dorothee <[imbert.4@osu.edu](mailto:imbert.4@osu.edu)>

**Subject:** FW: Concurrence Request for Climate Change Fundamentals undergraduate certificate

Hello David and Rosie,

CRP is in support of this certificate,

Best,

Judith

**Judith Dunham Borst**

Section Program Coordinator

Knowlton School

---

Architecture | City and Regional Planning | Landscape Architecture  
200K Knowlton Hall, 275 West Woodruff Avenue, Columbus, OH 43210  
614-292-8133 Office  
[Dunham-Borst.1@osu.edu](mailto:Dunham-Borst.1@osu.edu) / [knowlton.osu.edu](http://knowlton.osu.edu)  
[she/her/Judith]

## **Knowlton**

**From:** Conroy, Maria <[conroy.36@osu.edu](mailto:conroy.36@osu.edu)>  
**Sent:** Tuesday, April 19, 2022 12:32 PM  
**To:** Dunham-Borst, Judith <[dunham-borst.1@osu.edu](mailto:dunham-borst.1@osu.edu)>  
**Cc:** Hanlon, Bernadette <[hanlon.42@osu.edu](mailto:hanlon.42@osu.edu)>  
**Subject:** RE: Concurrence Request for Climate Change Fundamentals undergraduate certificate  
Judith

I'm in support of the certificate! Sorry if that wasn't clear on the earlier go round 😊

Best  
maria

**From:** Dunham-Borst, Judith <[dunham-borst.1@osu.edu](mailto:dunham-borst.1@osu.edu)>  
**Sent:** Tuesday, April 19, 2022 11:00 AM  
**To:** Conroy, Maria <[conroy.36@osu.edu](mailto:conroy.36@osu.edu)>  
**Cc:** Hanlon, Bernadette <[hanlon.42@osu.edu](mailto:hanlon.42@osu.edu)>  
**Subject:** RE: Concurrence Request for Climate Change Fundamentals undergraduate certificate  
Hi Maria, again!  
Could you tell me -even though our courses are not involved in this- if you would approve this certificate proposal, or if you see red flags?  
Thank you!

**From:** Conroy, Maria <[conroy.36@osu.edu](mailto:conroy.36@osu.edu)>  
**Sent:** Tuesday, April 19, 2022 8:56 AM  
**To:** Clark, Jennifer J. <[clark.3550@osu.edu](mailto:clark.3550@osu.edu)>; Dunham-Borst, Judith <[dunham-borst.1@osu.edu](mailto:dunham-borst.1@osu.edu)>  
**Cc:** Hanlon, Bernadette <[hanlon.42@osu.edu](mailto:hanlon.42@osu.edu)>  
**Subject:** RE: Concurrence Request for Climate Change Fundamentals undergraduate certificate  
Jennifer

I'm not clear what coordination you are requesting. I am a member of the steering committee for the certificate and had reached out about inclusion of CRP courses early on in the certificate design process. I believe Kim spoke with Bryan Mark about potential course inclusion but as I understand it, because our climate considerations in the undergraduate curriculum are often a module or two of a course rather than the majority of a course, it did not go further. The certificate is set up to recognize both the physical and social sciences as foundational considerations for climate change fundamentals and as such I believe we have a role to play which is partly why I was asked and agreed to the committee position.

---

Moving forward, the steering committee will continue to evaluate course inclusion options. I am happy to bring forth CRP courses that could meet the intentions of the certificate.

Best

Maria

**From:** Clark, Jennifer J. <[clark.3550@osu.edu](mailto:clark.3550@osu.edu)>

**Sent:** Tuesday, April 19, 2022 8:19 AM

**To:** Dunham-Borst, Judith <[dunham-borst.1@osu.edu](mailto:dunham-borst.1@osu.edu)>; Conroy, Maria <[conroy.36@osu.edu](mailto:conroy.36@osu.edu)>

**Cc:** Hanlon, Bernadette <[hanlon.42@osu.edu](mailto:hanlon.42@osu.edu)>

**Subject:** FW: Concurrence Request for Climate Change Fundamentals undergraduate certificate

Judith, Maria,

This is the other GE curriculum conversation that needs coordination.

Please make sure that Bernadette is in the loop here as well.

Best,

Jennifer



**Jennifer Clark, PhD**

Professor and Head

City and Regional Planning Section

The Knowlton School College of Engineering

200F Knowlton Hall, 275 West Woodruff Avenue, Columbus, OH 43210-1138

614.292.1790 Office

Pronouns: she/her/hers. Honorific: Dr.

[Clark.3550@osu.edu](mailto:Clark.3550@osu.edu) / [Knowlton.osu.edu](http://Knowlton.osu.edu)

**From:** Flowers, Benjamin S. <[flowers.387@osu.edu](mailto:flowers.387@osu.edu)>

**Date:** Tuesday, April 19, 2022 at 8:11 AM

**To:** Clark, Jennifer J. <[clark.3550@osu.edu](mailto:clark.3550@osu.edu)>

**Subject:** FW: Concurrence Request for Climate Change Fundamentals undergraduate certificate

**From:** "Tomasko, David" <[tomasko.1@osu.edu](mailto:tomasko.1@osu.edu)>

**Date:** Monday, April 18, 2022 at 5:01 PM

**To:** "Flowers, Benjamin S." <[flowers.387@osu.edu](mailto:flowers.387@osu.edu)>, "Dunham-Borst, Judith" <[dunham-borst.1@osu.edu](mailto:dunham-borst.1@osu.edu)>, "Lenhart, John" <[lenhart.49@osu.edu](mailto:lenhart.49@osu.edu)>, "Bohrer, Gil" <[bohrer.17@osu.edu](mailto:bohrer.17@osu.edu)>

**Cc:** "Quinzon-Bonello, Rosario" <[quinzon-bonello.1@osu.edu](mailto:quinzon-bonello.1@osu.edu)>

**Subject:** Fw: Concurrence Request for Climate Change Fundamentals undergraduate certificate

Colleagues,

It looks like CRP and CEGE were involved in the development of this so I just want to

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confirm that it ended up being something you still support. Please let me and Rosie know of any comments we should forward with a note of concurrence.

David

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David L. Tomasko  
Associate Dean for Academic Programs & Student Services  
Professor of Chemical & Biomolecular Engineering  
The Ohio State University

**b.** Department of Civil, Environmental and Geodetic Engineering

**From:** Quinzon-Bonello, Rosario <[quinzon-bonello.1@osu.edu](mailto:quinzon-bonello.1@osu.edu)>

**Sent:** Monday, April 25, 2022 11:08 AM

**To:** Saltzman, Matthew <[saltzman.11@osu.edu](mailto:saltzman.11@osu.edu)>

**Cc:** Tomasko, David <[tomasko.1@osu.edu](mailto:tomasko.1@osu.edu)>

**Subject:** Concurrence Request for Climate Change Fundamentals undergraduate certificate  
Hello Mathew,

The Department of Civil, Environmental and Geodetic Engineering is in support of undergraduate certificate "Climate Change Fundamentals."

Thank you,

Rosie



**Rosario (Rosie) Quinzon-Bonello, M.Ed.**

Assistant Dean for Curriculum and Assessment

**College of Engineering**

122 Hitchcock Hall, 2070 Neil Ave.

Columbus, OH 43210

**From:** Bohrer, Gil <[bohrer.17@osu.edu](mailto:bohrer.17@osu.edu)>

**Sent:** Monday, April 18, 2022 5:09 PM

**To:** Tomasko, David <[tomasko.1@osu.edu](mailto:tomasko.1@osu.edu)>; Flowers, Benjamin S. <[flowers.387@osu.edu](mailto:flowers.387@osu.edu)>;

Dunham-Borst, Judith <[dunham-borst.1@osu.edu](mailto:dunham-borst.1@osu.edu)>; Lenhart, John <[lenhart.49@osu.edu](mailto:lenhart.49@osu.edu)>

**Cc:** Quinzon-Bonello, Rosario <[quinzon-bonello.1@osu.edu](mailto:quinzon-bonello.1@osu.edu)>

**Subject:** RE: Concurrence Request for Climate Change Fundamentals undergraduate certificate

**Yes. We still support it.**

I have been involved (as CEGE representative) with this initiative from the beginning.

ENVENG 4218 is part of the select list of "physical science" courses required this certificate

The certificate also requires a climate change related capstone and lists EnvEng capstone as a possible venue to achieve it.

These give our students enough classes that they can overlap, and will hopefully draw participation among engineers that want to take the certificate.

Gil Bohrer

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#### 4. College of Law

**From:** Ralph, Anne E. <ralph.52@osu.edu>

**Sent:** Saturday, April 23, 2022 10:22 AM

**To:** Saltzman, Matthew <saltzman.11@osu.edu>

**Cc:** Vankeerbergen, Bernadette <vankeerbergen.1@osu.edu>; Martin, Andrew <martin.1026@osu.edu>

**Subject:** Re: Concurrence Request for Climate Change Fundamentals undergraduate certificate

Dear Matthew—

Thanks for your email. The College of Law is pleased to grant concurrence. Please let me know if the College of Law can help in any other way.

Very best,

Anne



**Anne E. Ralph**

Associate Dean for Academic Affairs & Clinical Professor of Law

Michael E. Moritz College of Law

55 West 12th Avenue | Columbus, OH 43210

614-247-4797 Office | [ralph.52@osu.edu](mailto:ralph.52@osu.edu)

Pronouns: she/her/hers

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THE OHIO STATE UNIVERSITY

College of Arts and Sciences

School of Earth Sciences

275 Mendenhall Laboratory  
125 South Oval Mall  
Columbus, OH 43210-1398

614-292-2721 Phone  
614-292-7688 Fax

earthsciences@osu.edu  
www.earthsciences.osu.edu

July 13, 2022

To: Arts and Sciences Curriculum Committee  
Re: Climate Change Fundamentals Certificate  
From: Chair and Director of Geography and Earth Sciences

Dear ASC Curriculum Committee members,

As Chair and Director for the two academic units central to this proposal, we wholeheartedly support the proposal for a new Climate Change Fundamentals Certificate at Ohio State. Both our academic units, including the Department of Geography and the School of Earth Sciences, are committed to supporting new curriculum. We believe this will be a successful undertaking and eventually a very popular academic degree enhancement at Ohio State University.

We feel this new Climate Change Fundamentals Certificate would serve the students at Ohio State well, and provide access to integrated faculty expertise across Colleges, as well as excellent career opportunities. We will engage with alumni and professionals in industries and agencies that hire students with backgrounds in climate change, from both the perspective of climate science/engineering and climate policy/social justice, to enhance these career opportunities. The Sustainability Education Learning Committee (SELCO) reported high student interest in climate change and interdisciplinary training, thus addressing a critical gap in educational opportunities.

We have reviewed the full proposal and support the plans. We are committed to connecting with other units involved (including those included with members on the Steering Committee), and we are prepared to support our faculty as they move forward with this effort.

Sincerely,

Steven Lower  
Director, School of Earth Sciences

DocuSigned by:  
*Steven Lower*  
0B50EABB52894BA...

Darla Munroe  
Chair, Department of Geography

DocuSigned by:  
*Darla Karin Munroe*  
A4AE2227AC4D4AA...

**Certificate Of Completion**

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Subject: Please DocuSign: Climate Change Fundamentals support letter.docx	
Source Envelope:	
Document Pages: 1	Signatures: 2
Certificate Pages: 2	Initials: 0
AutoNav: Enabled	Envelope Originator:
Enveloped Stamping: Enabled	Kimberly Sue Miller
Time Zone: (UTC-05:00) Eastern Time (US & Canada)	1050 Carmack Rd
	Columbus, OH 43210
	miller.10449@osu.edu
	IP Address: 65.24.112.126

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**Signer Events**

Darla Karin Munroe  
munroe.9@osu.edu  
Chair  
The Ohio State University  
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Steven Lower  
lower.9@osu.edu  
Prof  
The Ohio State University  
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Envelope Sent	Hashed/Encrypted	7/13/2022 9:52:05 AM
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