Environment, Society, and Sustainability Institute (ESSI)
A Virtual Institute and Bold Plan for Today's Challenges

Report to Deans Mooney, Van Kooten, and Allison

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Indiana University Bloomington has substantial expertise connecting environment and sustainability issues to physical and health sciences, social sciences, humanities, and the arts. The College of Arts and Sciences, O'Neill School of Public and Environmental Affairs, and School of Public Health are collaborating with shared undergraduate programs (and more), through their joint Integrated Program in Environment (IPE). IPE has been a successful start and forms a foundation for activities that can further catalyze, develop, and highlight IUB's strengths across many dimensions of environment and sustainability. The sustainability and health of natural resources, environment, and human population have captured large investments from several funders in recent years.

We propose a virtual entity– the **Environment, Society, and Sustainability Institute (ESSI)** – with a purpose to further harness the creativity and effort of *all* disciplines to shape environmental solutions. ESSI will build on the original concept of IPE, creating a distinct gateway to environmental research, teaching, and service across IUB. The aim will be to house and channel interdisciplinary activities at IUB to raise the profile of the phenomenal environmental work undertaken by current and future faculty, staff, and students at IUB.

Key recommendations are:

- Research: Build a vibrant interdisciplinary research community at IUB
  - Build community via workshops, seminars, and social events
  - Create more opportunities for graduate and undergraduate research
  - Increase support for proposal development and communications
  - Create nimble research clusters to catalyze interdisciplinary collaboration that can evolve based on interests

- Teaching and education: Strengthen, streamline, and promote existing undergrad degrees; develop graduate programming
  - Review and revise undergraduate curriculum (already underway: awaiting market information from Eduventures)
  - Create accelerated master's programs
  - Support skills training program for graduate and postdoctoral fellows
  - Apply for training grants for undergraduate and graduate students (REU, etc.)
  - Internships and research engagement

- Service: Maintain and expand public engagement and service to the state, nation, and world
  - Develop outreach and service efforts at local, national, and global scale
  - Partner with IUB entities to build a healthier and more sustainable future for all (such as Center for Rural Engagement, Environmental Resilience Institute)
  - Expand outreach to a broader range of environmental issues

- Outstanding questions:
  - Leadership structure: ESSI needs strong intellectual, strategic, and managerial leadership for each of the three pillars of research, education, and service. Who should lead and how should that be organized?
  - Administrative home: The existing elements of the research and teaching pillars are created through multilateral agreements between schools. How do we create a vibrant, viable, coherent institute with these different structures in place?
  - Funding: How can IUB attract funds to build ESSI? Given the current structure and the growing interest and importance of environment and sustainability on campus, how can other responsibility centers join ESSI easily?

- Immediate next steps:
  (1) Create branding/marketing and web presence
  Create an implementation committee to develop a structure and identify budget needs
  (2) Identify a leader
  Faculty 100 hire?
  Senior researcher, possibly with promise of a couple of junior hires?)
  (3) Find donors to help fund ESSI – this will need to be a campus-level priority for the IU Foundation

Environment Society and Sustainability Institute (ESSI)
(A campus-wide virtual institute)

Harnessing the creativity and effort of *all* disciplines to shape environmental solutions

Research

Build a vibrant interdisciplinary research community at IUB

- Create research clusters to catalyze interdisciplinary collaboration
- Build community via workshops, seminars and social events
- Create a postdoctoral fellows program
- Provide support for proposal development, communications, and engage in fundraising

Education

Strengthen, streamline, and promote existing undergrad and grad. degrees; increase support for student programs

- Revise existing undergraduate curriculum
- Create accelerated master's programs
- Support skills training program for undergraduate, graduate and postdoctoral fellows
- Apply for training grants
- Support internships & research engagement

Service & Outreach

Public engagement and service to the state, nation, and world

- Partner with IUB entities (examples below) to build a healthier and more sustainable future for all
- Expand outreach to a broader range of environmental issues

← Research and Teaching Preserve →

Environment Research clusters

- Biodiversity
- Climate solutions
- Pollutants & health
- Water, food, energy
- Energy transition
- Adaptation and resilience
- Climate justice & ethics

Cross-campus organizations

- Midwest Climate Adaptation Science Center
- Sustain IU
- Environmental Resilience Institute
- Center for Rural Engagement
- ...and others

Charge to Environment and Sustainability Committee 09/21/23
Developed by Deans Mooney and VanKooten

Committee: Shahzeen Attari, Phil Stevens, Richard Phillips, Rebecca Lave, Sarah Commodore, Richard Hardy, Suzanna Sumkhuu.

Develop a report with recommendations for a "virtual" institute that showcases to external audiences IU's significant strengths in the environment and sustainability space. The report should include shorter term, implementable ideas (items that could be accomplished in 1-3 years) as well as "*blue sky*" thinking for longer term planning.

The IPE is a collaboration between COAS, O'Neill and SPH – in the short-term focus on these schools, in the longer term there are options to add more dimensions e.g. Luddy, Eskenazi etc. The institute would not be a new RC, it would not grant degrees. Consider how existing resources could be recombined in the short term.

Questions to address (not exhaustive):

1. What existing programs/elements from IPE and RTP should be included in the new entity? How best can these be leveraged?
2. Are there specific areas/issues related to environment, society and sustainability that could be the focus?
3. What undergraduate and graduate programs would best fit under this new initiative – most support the focus?
4. What grant and funding opportunities could be pursued to support student programming and curriculum development?
5. Are there 3-4 research foci that can be identified that would tie together existing research strengths and/or provide opportunities for new areas of strength?
    a. What grant and funding opportunities are available to bolster these strengths?
    b. How could new structure enhance collaborative research?
6. What role could ERI play within this larger entity (still retaining its name)?
7. What other opportunities should be considered in developing the Institute?

Committee for this report: Shahzeen Attari (Professor O'Neill), Rebecca Lave (Associate Dean for Social and Historical Sciences - Professor Geography), Sarah Commodore (Assistant Professor Environmental and Occupational Health), Phil Stevens (Associate Dean for Faculty Affairs - Professor O'Neill), Richard Phillips (Science Director of Research and Teaching Preserve; Chair of IPE Executive Committee; Professor Biology), and Richard Hardy (Associate Dean for Undergraduate Education - Professor Biology).

1. Introduction

In September 2023, our committee was created and tasked with developing recommendations for a virtual institute that showcased IUB's strengths in environment and sustainability. We were asked to include both short term ideas that could be accomplished with existing resources and bigger "blue sky" ideas for longer term planning.

The plan below proposes the creation of the Environment, Society, and Sustainability Institute (ESSI) at IUB. ESSI builds upon the existing framework provided by the Integrated Program on the Environment (IPE), rebranding it and further developing its reach and impact. Below, we address needs for virtual and physical infrastructure, leadership, research, education, and outreach for ESSI, with recommendations divided into **immediate** (Spring 2024), **short-term** (1-2 years), and **longer-term** (2-5 years).

These recommendations have been informed by in-depth conversations with nearly two dozen people across campus, as well as directors of other successful environmental institutes at peer institutions (all listed in the acknowledgements). Due to time limitations, we were unable to meet with some relevant people and organizations; we hope future committees will engage with them and expand the scope of our work.

Our charge was to focus on IUB rather than develop a system-wide initiative. The potential advantages of a system-wide environmental institute should be considered by a future task force. While we do not address specific funding mechanisms here, we note that strong internal support and external funding will be crucial for the Environment, Society, and Sustainability Institute to live up to its full potential.

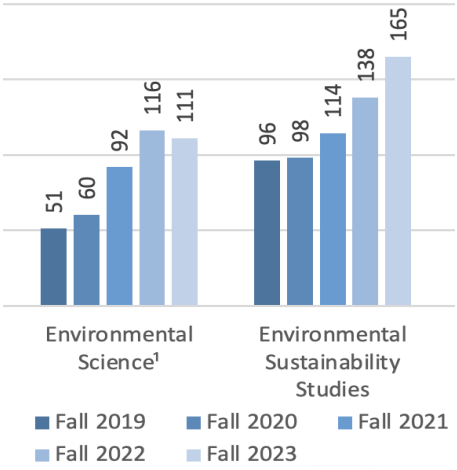
2. Existing environment and sustainability initiatives at IUB

IUB has substantial interdisciplinary expertise connecting environment and sustainability issues to physical sciences, social sciences, humanities, and the arts. As the history of these initiatives has been covered in other reports[1], we focus here on the current state of interdisciplinary research, teaching, and service at IUB.

A series of independent initiatives culminated in the **Integrated Program in the Environment** (IPE). Created in 2012 and funded primarily by the College of Arts and Sciences and O'Neill School, (with contributions from the School of Public Health and Provost); IPE has been most successful at supporting undergraduate programs. There are opportunities to expand on this success and build stronger research connections among environmental researchers at IUB.

[1] "Proposal to create Integrated Program in the Environment" (2012) and "Creation of an IU Institute on the Environment to Integrate Research, Education, and Community Engagement" (2022).

These efforts are already underway through the IU Research and Teaching Preserve (RTP) that provides a vital platform for long-running field research campaigns and outdoor education.



IPE has been successful on the undergraduate teaching front, creating the B.A. in Environmental & Sustainability Studies (BAESS), growing the B.S. in Environmental Science (BSES), and hosting a minor in Water Resources. Through collaboration with Sustain IU, IPE created the Sustainability Scholars program, which pairs undergraduates with faculty mentors to conduct hands-on research. Majors in the BAESS and BSES have grown over the last five years[2], however the total number of majors is lower than would be expected given numbers at peer institutions based on a recent EduVentures report commissioned by the Provost.

Interdisciplinary environmental outreach and service at IUB is on strong footing via the **Environmental Resilience Institute** (ERI; created in 2017; funded initially at the Campus level and now by Campus, external grants, and philanthropy). ERI provides a home for very successful faculty-led initiatives to strengthen K-12 environmental education in Indiana (the "Educating for Environmental Change" program) as well as outreach programs to high school students (the Environmental Leadership Summit and the E&S summer camp). More recently, major donations from the McKinney family have funded the McKinney Climate Fellowships (along with funding from O'Neill and others), which enable IUB students to work directly with Indiana cities and towns to develop climate action plans.

The **Research and Teaching Preserve** (RTP; created 2001) was created by the IU Trustees with the mission "to provide natural field settings for research and teaching that complement existing facilities and infrastructure". The RTP consists of eight land holdings totaling 1,600 acres (forests, fields and farms), 6,000 sq. ft. of lab space (at Griffy Woods) and a lake (University Lake). On the education front, the RTP facilitates numerous courses for IU students, community workshops, high school camps, and K-12 class visits. Additionally, the RTP supports outreach initiatives, including programming for IPE and ERI, ERI's Educating for Environmental Change summer workshops for secondary education teachers, IPE's Summer Experience in Sustainability and the Environment camp, and community education programs. The RTP is an excellent example of how investments in environmental research, teaching and outreach can pay dividends (generating ~$11 million over the past five years).

Other existing units focused on the environment and/or sustainability at IUB include (and are not limited to) the Ostrom Workshop, Sustain IU, and the new Midwest Center for Biodiversity.

Sustain IU has provided crucial support for IPE's mission by providing:

[2] Indiana University Bloomington. Integrated Program in the Environment. (2023). Annual Report 2022-2023.

- Sustainability Course Development grants for TT and NTT faculty, which enabled expansion of relevant course offerings;
- Sustainability Research Development grants, which provided summer funding for undergraduate and graduate students to conduct independent environmentally focused research; and the
- Sustainability Scholars Program, which provided both funding and mentoring for undergraduates to work with IUB faculty on environmentally related research.

Sustain IU is transitioning to a new focus on campus "operational sustainability". This transition offers opportunity to work with personnel from Sustain IU and integrate activities such as student internships, research, and co-curricular experiences into ESSI.

3. Structure and leadership

IUB is not effectively communicating its environmental strengths to an external audience, including prospective students and large funders. There are many environmental and/or sustainability related institutes, centers, and organizations at IUB, and the relations among them and whether they offer degrees is difficult to discern by an external audience, particularly online. This lack of coordination and clarity can thwart prospective students, donors, and deeper engagement. The Environment, Society, and Sustainability Institute (ESSI) will build on the foundation of IPE, to be the one-stop shop for external and internal audiences to find out about environmental projects and work happening at IUB.

There are a variety of funding sources that could be used to support ESSI. A major source is existing commitments to IPE that support a director, co-directors, the RTP, student services and physical infrastructure. In addition, there are opportunities to pursue external funding from grants and contracts from faculty affiliated with the institute, and corporate and private philanthropy.

Additional investment over and above that available for IPE will be necessary to launch and grow successful long-term initiatives.

Recommendations for structure and leadership

1. **Create visibility for the new institute in *one* place**
    a. *Immediate:* Create a website for the virtual "Environment, Society, and Sustainability Institute" where research, education, and outreach are all under one umbrella. This website would serve as a "front door," introducing all the elements of the ESSI, with links to curriculum and undergraduate programs.
    b. *Short-term:* Invite all entities supporting the environment on campus to connect to this one stop shop – everything from undergrad to PhD offerings, research news, etc.
    c. *Longer*-term: Consider finding a neutral physical home for ESSI to foster deep IU community engagement and collaboration

2. **Establish leadership of the institute**
    a. *Immediate:*
        i. Identify intellectual leadership, trusted by all three schools
        ii. Establish leadership for research, teaching, and outreach pillars for ESSI
    b. *Short-term:* Recruit a superstar external director via an international search. We recommend someone who deeply cares about interdisciplinary research, who has a leadership style that prioritizes the growth, well-being, and empowerment of staff, and who can facilitate active involvement from RCs across campus.

3. **Establish governance structure of the institute**
    a. *Short-term:*
        i. Create an internal board of advisors made up of faculty across campus to help advise programmatic development
        ii. Create a student board to advise on programming and community building
    b. *Longer-term:* Create an external board of advisors with at least two of the following three attributes: topical expertise, important connections, and/or ability to contribute substantially to funding the institute.

4. **Develop a stable, cross-Campus funding base for ESSI**
    a. *Immediate:* Develop a short-term budget for ESSI building on funding for IPE
    b. Short and Long-term:
        i. Develop longer term funding model for buildout of ESSI
        ii. Work with development/advancement officers of relevant units, and IU Foundation to identify potential funders for ESSI.
        iii. Work with Associate Vice-President for Research Development to apply for major center grants, including initiatives developed by Research Communities of Practice (see Section 5 below).
        iv. Incentivize interdisciplinary faculty teams to apply for major external funding.

4. Education and teaching

The undergraduate degrees under IPE are growing, but there is still strong potential for growth (as compared to peer institutions and identified by EduVentures). Based on our interviews with IUB faculty and staff, the current degrees lack visibility and community cohesion in the eyes of students and faculty. To address this, we recommend curricular and staffing changes to increase faculty buy-in and improve both student perceptions of and experiences in programs related to environment and sustainability at the undergraduate and graduate levels.

On the curricular front, we recommend a “from scratch” review with the goal of simplifying and streamlining the curriculum for each of the undergraduate majors while providing a sense of identity and community for students pursuing them. We suggest that this review be conducted

by an *ad hoc* committee that includes at least one member of this task force, faculty leads for each degree, and members with little/no historical connection to the curriculum and courses. We also suggest including an introductory course and capstone to help build community among BAESS, BSES and other undergraduate degrees in environment and sustainability majors.

Similarly, a greater sense of community could be achieved for students within graduate programs related to environment and sustainability.

Co-curricular and extra-curricular opportunities such as living learning communities, internships (environmental justice fellows, sustainability scholars (currently through Sustain IU)) and research experiences would be more broadly available to students and housed in one easy to find location under ESSI.

Recommendations for education and teaching

1. **Simplify and strengthen the BAESS, BSES degrees, and other environmental and sustainability degrees, while also building stronger ties and identity among students in those majors**
    a. *Immediate:* Convene an ad hoc curriculum committee to review and revise the BAESS and BSES curricula that at minimum addresses the following:
        i. In line with IUB2030, create or designate from existing course options a lower-level seminar and an upper-level capstone specifically for students pursuing these degrees.
        ii. Consider an experiential learning requirement (internship, on-campus work, study away, research) related to the major.
        iii. Simplify the major requirements to provide greater coherence and identity. Currently there are huge lists of courses that can satisfy requirements. Utilize student enrollments to help determine which courses make the most sense to keep and those that should be removed.
        iv. As part of curricula update, reflect the current state of the disciplinary field, student interest, and recommendations from EduVentures.
        v. Consider a rebranding of transcriptable concentrations to better reflect areas of strength.
        vi. Interview and survey students in the programs to identify what works well and what changes need to be made.
        vii. Identify funding sources to support course development
        viii. Identify funding sources to support UG research in environment and sustainability
    b. Short-term:
        i. Review recommendations of the *ad hoc* curriculum committee with relevant units
        ii. Implement recommendations of the *ad hoc* curriculum committee

iii. Evaluate the success of the changes implemented via enrollment data; surveys of students and those who have left the majors; and interviews with relevant faculty
iv. Identify and/or develop a stable funding source for the Sustainability Scholars program, Sustainability Research grants for undergraduates and graduates, and Sustainability Course Development grants.

c. *Longer-term:* Conduct periodic evaluations of the state of the degree programs and update as needed.

2. Create and promote clear program visibility

a. *Immediate:* Create a "one-stop shop" for undergraduate and graduate environmental degrees across campus through a website that clearly articulates and differentiates between programs, certificates, and minors
b. Short-term:
i. Create regular events such as seminars or journal clubs and promote them for students pursuing degrees within ESSI.
ii. Work closely with recruiting and admissions for each unit (College, O'Neill, and SPH) to ensure ESSI involvement in recruiting and outreach events.
iii. Work across campus to show the relevance of environment and sustainability to many majors. For example: work with Kelley Pathways program to outline the business relevance of degree programs within ESSI and promote them to pre-business students as viable alternative pathways to business related careers.

3. Develop Accelerated Master's Programs

a. *Short-term:* Develop paths from undergraduate programs to multiple extant master's degrees through the Accelerated Master's Program (AMP). Linking undergraduate degrees to programs such as the MS in Environmental Science and Master of Environmental Sustainability in O'Neill and Masters in GIS in the College would provide attractive paths to a graduate degree for undergraduate students.

4. Develop shared program and training in effective science communication

a. *Immediate:* Reach out to practitioners in news and communications as well as the Media School to create a pilot training program for graduate students and faculty
b. *Short-term:* Create a student and faculty "communications cohort" to enhance our research outreach. Example activities could include the op-ed project and media training.

5. Develop training grants Training grants provide funding to support undergraduate and graduate training and are often catalysts for the development of large collaborative projects and

proposals. Faculty are well-positioned to develop these proposals, but need incentives (e.g., teaching releases, administrative supplements) given that these proposals are time-consuming and challenging to develop. At present, there are few mechanisms in place to spur the development of large cross-unit training proposals. ESSI could change this landscape by providing a platform for collaborations and proposals.

a. *Immediate:* Develop a working group to determine what incentives are available and appropriate to encourage proposals for training grants and to identify potential leaders for them (e.g., teaching releases). Discuss mechanisms to incentivize submission with Deans and heads of Units.
b. *Short-term:* Once a leader has been identified, bring together faculty to discuss themes of training grants such as those at NSF (REU for undergrads; NRT for grads) and NIH (T32s, F series and/or K99 and Mosaic fellowships).
c. *Longer-term:* Submit one or more interdisciplinary training grants to NSF and NIH, e.g. the NIH-funded T32 grant “Common Themes in Reproductive Diversity” (CTRD) at IU, which provides a blueprint for how to develop a long-running training grant.

Education challenges to avoid

- Avoid creating new minors or certificate programs that overlap with current programs. There is space at the graduate level to offer a 9-15 credit certificate in identified fields related to the EduVentures undergraduate recommendations. We could create new programs at the undergraduate level but should be cautious about curricular overlap with other credentials.

5. Research

There is extraordinary breadth in environmentally focused research at IUB, but few mechanisms to support interdisciplinary collaborations within and across units. Because the growing environmental challenges we face are biophysical and social, cutting across numerous disciplines, transformative and translational environmental research is inherently interdisciplinary. Calls from major funders (e.g., NSF, Sloan Foundation) are themselves increasingly interdisciplinary. Thus, there is a critical need to strengthen linkages across Schools and departments on topical areas.

We suggest a menu of options that include short-term opportunities that are free or low cost, such as an internal speakers series and Research Communities of Practice, and longer-term suggestions that would require more substantial investment, such as developing a Postdoctoral Fellowship program. While most of these options are self-evident, we explain our thinking on the Research Communities of Practice and Postdoctoral Fellows programs below.

The proposed Research Communities of Practice (RCoP) program could develop a thriving, highly visible interdisciplinary environmental research community at IU. The RCoP would consist of a small competitive grant program (e.g., $10k) to support groups of faculty across Schools in exploring a particular topic (e.g., climate justice, AI and environmental health) via monthly seminars, workshops with outside experts, etc. The goal of RCoP would be to catalyze

interdisciplinary collaboration that would lead to the submission of new collaborative grants and could evolve into more established externally-funded centers under the umbrella of the ESSI (see for example the four research centers within the Nelson Institute at the University of Wisconsin, several of which started through a RCoP style program).

The goal of a highly competitive Postdoctoral Fellows program would be to catalyze research that accelerates possibilities of new techniques, skills, and interdisciplinary connections. In collaboration with IUB faculty, Postdoctoral fellows will enhance our capacity to develop and carry out transformative and translational environmental research and raise IUB's profile in the international environmental research community. Such a model has been employed successfully at other universities such as the Earth Institute at Columbia University; Ciriacy-Wantrup Fellows at UC Berkeley; and Global Change Biology Fellows at University of Michigan). These programs provide a blueprint for success.

Recommendations for research

1. **Encourage existing IU faculty to build a vibrant interdisciplinary environmental research community** By bringing together environmental researchers on campus face to face, people can become familiar with one another's work and explore/pursue collaborations.
    a. *Immediate:* Create a *monthly* mixer/social hour on campus and *monthly* seminar series. Speakers would be IU faculty members and could speak at existing seminar series on campus (e.g., Geography's colloquium, EEB's seminar series, O'Neill's Environmental Science seminar series). The primary target would be speakers with interdisciplinary environmental research programs. One way to ease into these seminars would be to invite current and new units to showcase their strengths (e.g., ongoing research projects, faculty and infrastructure) via lightning talks or more informal gatherings before developing a full-blown seminar with a research talk.
    b. *Short-term:* Initiate an *annual* retreat around an environmental theme that brings faculty, postdoctoral fellows, and students to share ideas and findings, and to promote an atmosphere conducive to collaboration. Retreats could be held at the field lab at Griffy Woods or the camp at Bradford Woods (both part of the RTP, so no rental space costs would be incurred).
    c. *Long-term:* Create a named Lecture (seminar speaker) *once a year* to support an on-campus visit by an internationally acclaimed environmental researcher. The visitor could give a talk in an existing seminar series or be part of a newly formed "ESSI Lecture". This would provide opportunities for faculty, staff and students to interact over meals and receptions (e.g., a low-key version of Patten Lectures)

2. **Facilitate new collaborative research** Develop a small grants program to develop Research Communities of Practice (RCoP): cross-School groups of faculty who wish to pursue a new interdisciplinary environmental topic (e.g., climate justice, energy

transition, etc.) via reading groups, invited talks, leading to the submissions of new collaborative grants.

a. *Immediate:* Create a RFP to elicit ideas from the community by talking with environmentally related faculty across IUB
b. *Short-term:* Fund an initial cohort of 2-3 RCoP
c. *Longer-term:* Support most vital RCoP's in winning external funding to develop into stable research Centers.

3. **Accelerate research capacity by creating a competitive Postdoctoral Fellows program** A Postdoctoral Fellows program would catalyze collaboration between faculty members from different research areas and push IUB into new areas of cutting-edge environmental research.
    a. *Immediate:*
        i. Develop a budget to support a Postdoctoral Fellows program.
        ii. Determine what the different units (O'Neill, COAS, SPH, and others) are doing to support postdoctoral researchers and work together to share the workload and streamline efforts for ESSI associated postdocs. For example, SPH Associate Dean for Research is developing a template for a within unit postdoctoral office with staff.

    b. *Short-term:* Work with IU Foundation to identify donor(s) for a small cohort of postdoctoral fellows (2-3 per year for 2 years), with the goal of increasing the number of fellows over time as funding becomes available. Each postdoctoral fellow would be mentored by two ESSI faculty members. Postdoctoral fellows would be selected based on merit (publications and grants) and their vision and ability for supporting impactful, collaborative research at the ESSI.

    c. *Longer-term:* Create an interdisciplinary postdoctoral fellows program. The program would support (5-6 postdocs per year for 2 years) to work on interdisciplinary research questions, while also enabling trainees to develop mentoring and management skills. For the latter, a combination of seminars, courses, workshops, and mini conferences would be focused on topics such as scientific writing, statistical literacy, DEI, mentoring and career development. Additionally, bi-weekly or monthly journal club meetings would allow postdocs to present novel papers in their respective disciplines, solicit feedback from their colleagues on conference presentations and network with one another.

4. **Expand the base of participants** The proposed institute could bring together not just students and faculty in COAS, O'Neill and SPH, but across IUB.
    a. *Short-term:*
        i. Identify and invite faculty from other Schools to present lightning talks at ESSI.

    b. *Longer-term:*

i. Consider adding an urban site to RTP that would broaden the range of researchers benefiting from its successful model of interdisciplinary environmental research and teaching.
ii. Consider allowing experimentation at RTP sites (treatment and control sites), which could expand its potential for biophysical environmental research.
iii. Reach out to deans and faculty in other Schools to start building connections (e.g., Kelley, Media, Eskenazi, Luddy).
iv. Identify potential courses that could be included in BSES and BAESS degrees through the ad hoc curriculum committee.

5. **Diversify participation in environmental research** While there have been no studies about the demographics of environmental researchers on campus to our knowledge, national trends in the US suggest that many racial and ethnic groups are underrepresented in environmental research.
    a. *Immediate:* Partner with existing IU initiatives on campus. Two suggestions (1) The Louis Stokes Alliances for Minority Participation (LSAMP). LSAMP seeks to increase diversity in STEM and is aligned with the goals of the Federal Government's five-year strategic plan for STEM education. Martha Oakley is the contact person for this program, and they are looking for mentors to host diverse scholars in our laboratories and research field endeavors for 8 weeks each summer. (2) IU STEM Summer Scholars Institute (STEM SSI). This is an 8-week undergraduate research program designed to give motivated undergraduate students hands-on experience in graduate-level research and to encourage them to apply to graduate school at IU or elsewhere (although IU is typically their first choice after the summer experience). Howard Sims (Assistant Dean for Diversity and Inclusion) oversees this program.

    b. *Short-term:* For PIs with ongoing grants, many funding agencies offer supplements to bring in underrepresented scientists and we can harness these resources and write short grants to bring in scientists and emerging scientists across the US for summer research programs (high school, undergraduate, graduate and postdoctoral level).

    c. Long-term:
        i. Write NSF, NIH and other grants that focus on building capacity for underrepresented students and scientists in the environmental sciences and have ESSI specific training programs.
        ii. Partner with minority serving institutions to build research capacity (student and faculty exchange programs, grants, etc.) and train the next generation of environmental scientists.

Challenges to avoid for research

- Dilution by (over) inclusion. While there are reasons to make the environmental tent as encompassing as possible, there are risks of diluting the core strengths by being overly broad and unfocused.
- Creating programs that are successful at their inception (e.g., postdoctoral fellows program; RCoP, etc.) but are unsustainable due to funding constraints.
- The natural tendency for creating silos. Co-mentoring is a great first step towards promoting collaboration, but this could still create silos if the mentees are not engaging with other groups.

6. Outreach and service

Faculty across the environmental, social and sustainability areas within SPH, O'Neill and the College all contribute to significant outreach and service to the state, nation and globally. They also contribute to efforts undertaken by the Center for Rural Engagement and the Environmental Resilience Institute, whose mission is to better prepare Indiana and the Midwest for environmental changes that affect individuals, communities, businesses, and natural systems. The charge here focuses on resilience and the Midwest region.

Recommendations for outreach and service:

1. **Expanding the scope to environment and sustainability more broadly, and to the nation and world**
    a. *Short-term:*
        i. Identify and invite into ESSI IUB faculty who conduct community-engaged environmental research.
        ii. Increase impact in the state (e.g. partner with NPR WFIU) and across the country and beyond (e.g. team up with IU Research Communications Videographers who participate in a partnership with the Associated Press called "Campus Insights"). Increase engagement and partnerships with campus entities that excel at community engagement such as center for rural engagement and ERI.
    b. *Longer-term:*
        i. Expand and promote existing community-engaged research at the national and international level.
        ii. Develop podcasts to highlight research, provide Op Eds on umbrella institute's website so lay people can easily access materials and information.
        iii. Develop community wide events during the semester and the summer for the public to engage with ESSI.

Outreach challenges to avoid

- Avoid duplicating or interfering with outreach and funding efforts by existing IUB units.

7. Lessons learned from other institutions

Lastly, our committee interviewed leaders from other institutes across the U.S. While there are many lessons to choose from, we highlight a few below (and shown in Table 1).

Things that work

- Advisory board or steering committee to provide constructive feedback
- Seed funding around a theme to build intellectual community
- Good relationships with other Deans/Schools
- Physical space to connect

Problems to avoid

- No continuous leadership structure or plan of succession (one leader leaves and the whole program comes to a halt).
- No buy in/commitment from faculty and administration will hurt

Funding mechanisms

- Internal funding sources are present in all institutes (~$3-6M)
- Recommend foundations such as Walton, Sloan – but building relationships there require time (2-3 years). Some institutes have their own donor officers, and they provide a partial salary to the officer.
- Some institutes have their own faculty that primarily do research and apply for big grants, those indirect cost returns stay with the institute.

Table 1. Key takeaways of interviews conducted with institute leads in the U.S.

	Institute for the Environment University of Minnesota	**Wrigley Institute for the Environment** University of Southern California	**Nelson Institute** University of Madison-Wisconsin	**Institute for the Environment** University of North Carolina	**Institute for Global Change Biology** University of Michigan	**Institute of Genomic Biology** University of Illinois Urbana-Champaign
Budget	$10M ~$5M internal from university and $5 M externally	$7M $3-4M in stable budget	$12M $25M endowment	$10M	$3-4M/yr for 6-7 years (80% for faculty and post-docs); some post-docs and faculty lines are partnerships with other units, so hard to estimate costs	Varying budget, operated from Provost's Office (faculty can request varying amounts of seed grants for thematic grant foci)
Funding	Recurring budgets which do not allow faculty to route grants through institute. Of budget, ⅓ goes to big grants and workshops, ⅓ goes to staff salaries (of which ⅓ goes to communication), ⅓ is research within the institute	Extensive fundraising with donors and philanthropist organizations (2-3 meetings per week, 150 contacts per year). Of budget, $300-500k per year given as seed awards and they have three research centers: environmental monitoring, applied solutions, and social	Half from Campus: fixed (staff and faculty salaries) and variable (credit hours from courses taught by Nelson staff) Half from external sources: philanthropy, external grants Include formal research centers and more informal faculty research groups.	$2.5M from university, $2M donors, $5.5M contracts and grants Includes multiple research centers and labs Research only: undergrad degree housed elsewhere	Initial investment of $13.5M for 6-7y + 4-6 FTE faculty lines Dean has indicated major donor support may be forthcoming, though size and scope is unknown Major funding (besides faculty) includes postdocs; other costs of working groups/collaborative teams, summer PhD projects, and Exchange Fellow	Seed grants, leads to collaboration of $250k+ NSF grant for New Climate Center and other external grants Overall head who reports to Provost. Everyone else is part of their home departments/units and use grants or departmental funds to cover their work.

		transformation; March of every year they have a symposium that everyone attends	Undergrad and grad degree		support.	
Advice	Recommends "**servant leadership** rather than hero leadership"; their institute is system wide Think about "strategic risk taking" big ideas attract big funding	**"Hard to get anything off the ground without funding"** Go visit institutes and see what they are doing, talk to multiple staff members and students	**"Costs money to build community"** Seed funding to generate big grant applications has been a waste of time, but seed funding to build intellectual community "works 8 times out of 9."	**Advisor board is really useful. Select members for 2 of 3:** 1. **Expertise** 2. **Capacity to give** 3. **Connections** **Do not compete with areas departments/ schools are already in. Find the less crowded spaces**	Extra value of "non-earmarked dollars" is they can help "build partnerships in flexible ways".	Need **human connections** to **function** and be **successfu**l **Synergy** is important – do not let one entity take charge **External reviewers** (advisory board) Research themes proposed by faculty (results in **successful grant applications**) **Physical space** for teams to work Encourage and **teach students to write grants** Fund teams (not individuals) who show a **clear plan for next level funding**)

Below is an Appendix from the previous taskforce report, entitled: “Creation of an IU Institute on the Environment to Integrate Research, Education, and Community Engagement” (2022), which similarly compares environmental programs of peer institutions.

Appendix 3. Comparison of environmental programs at leading peer institutions.

University	Principal Env. Organization	US News Rank-ing	Faculty Affiliates/ Own Faculty?	Number of Students in Program	Administrative Arrangement	Year Estab-lished	Unit standing	Undergrad degrees	Graduate degrees	Research Centers
University of Wisconsin	Nelson Institute for Environmental Studies	#13	170	Ugrad: 800 Grad: 200	dean appointed by chancellor of the university; multiple research center directors,	1970	freestanding campuswide unit	1 degree + 3 certificate programs	6 MS degree programs	4 research centers
Duke University	Nicholas School of the Environment	#7	145 core & affiliated faculty	Ugrad: 150 Grad: 350 PhD: 120	Dean & two associate deans + three department chairs	1991	school within university	3 degree + 2 certificate programs	3 MS + 5 PhD programs	Duke University Marine Lab
University of North Carolina	Institute for the Environment		250 affiliated		Director with center directors	2007	freestanding institute “public face” of all Env. programs on the campus	4 degrees + 2 minors	Linkages with departmental grad degrees	2 centers + RTP
University of Minnesota	Institute on the Environment	#4	34 affiliates, ~50 staff, researchers, & scientists		Director reports to OVPR, advised by Faculty Leadership Council & External Advisory Board	2007	cross-campus, interdisciplin ary institute	no degrees, 1 minor	No grad degree programs	4 "Knowledge Initiatives"
University of Michigan	School for Environment & Sustainability	#16	72 own faculty	550?	Leadership team of 5 faculty, external advisory board	1903	Cross-campus school	university-wide collaborative undergraduate program	8 MS + many dual degree and graduate Certificate Programs	6 research centers/institutes
University of Washington	College of the Environment	#8	199 faculty	Ugrad: 1200 Grad: 400	Dean, Executive Committee		College	10 undergrad degrees (incl. accelerated BS/MS)	10 MS + 7 PhD	8 departments + 8 research institutes
Indiana University	ERI/IPE		148	307	Directors appointed by VPR, schools	2017/2 012		2 degrees + 2 minors	None	None

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