Proposal for the School of Environmental Security

College of Natural Resources and Environment

1. Proposed Name: **School of Environmental Security**

2. The proposed school will be initially comprised of people and programs within the College of Natural Resources and Environment (CNRE), particularly its Center for Leadership in Global Sustainability and its Center for Geospatial Information Technology.
3. Proposed effective date of the organizational change: June 1, 2021.

4. Proposed Mission:

- **Mission:**
    - The College of Natural Resources and Environment (CNRE) is proposing the establishment of a Washington DC Metro Area-based and focused school that will build upon the college's successful presence and programming in the Washington DC Metro Area over the past two decades. The new school brings an integrated approach to the emerging topic of *environmental security* and leverages the CNRE's broad expertise and experience in that realm.

      Environmental security is a term historically subject to multiple and sometimes competing interpretations.[1] One prominent and applicable definition of Environmental Security suggests that it is: *The process of peacefully reducing human vulnerability to human-induced environmental degradation by addressing the root causes of environmental degradation and human insecurity.* [2]

      However, for the purposes of the proposed School and its academic products and services, we rely but also build upon that definition to arrive at:

      Environmental Security is the practice of identifying, managing, and reducing the vulnerability of humans and human systems to human-induced environmental risks and stressors including climate change, resource abundance and scarcity, natural disasters, resource conflict, pollution, and degradation of ecosystem services.

      The proposed School is a product of an innovation strategy designed to identify and exploit a series of blue ocean[3] opportunities for the CNRE.

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[1] Environmental Security: Approaches and Issues

[2] J. Barnett, The Meaning of Environmental Security, London: Zed Books, 2001 p.129.

[3] Chan Kim, W. and R. Mauborgne. 2015. Blue Ocean Strategy. How to Create Uncontested Market Space and Make the Competition Irrelevant. Harvard Business Review Process. Boston, MA. 287pp.

Environmental security is a relatively new area of academic focus[4], one in which value innovation can create and capture rising interest in the applied environmental problem solving that is at its core.

Through a series of linked innovations (profit model, structure, product performance, process)[5] the CNRE is positioning the School of Environmental Security as a leading entity in an emerging field, providing an integrated collection of scholarly products that will differentiate the school, the college, and the university among both their peers and competitors.

The School has been conceived to occupy the space created by the emerging concept of environmental security. Our market research suggests that we are in a "blue ocean," where we find a relatively unpopulated space, currently uncontested by other academic institutions. Environmental security also appears as an increasingly urgent concept, one that is appearing in ever more venues—public and private. By jumping ahead of exploitation of this concept by our peer and competitor institutions, we are positioning the CNRE and VT as national leaders. We estimate that we are approximately five years ahead of our competition in adopting the environmental security framing as an applied academic approach to real-world challenges at a global scale.

The most important question is the means by which we will differentiate how we address environmental security versus other competing academic institutions that will arrive later on the scene. To wit, the mission of the new school is summarized as:

- *Mission Statement*

The School of Environmental Security delivers an integrated and transdisciplinary approach[1] to managing[2] the global environmental challenges[3] affecting our human well-being[4].

[1]Comprised of systems thinking around a set of factors that include natural resources, national security, governance, economics, politics, and culture.
[2] With tools that include: analysis, education, leadership, and innovation.
[3]Climate change, pollution, biological diversity, and water, energy, and food security.
[4]Human institutions, health, infrastructure, and prosperity.

For reference purposes, the School's mission is distinguishable from the CNRE's existing Center for Leadership in Global Sustainability in the Washington DC Metro Area, which explicitly focuses on both leadership and a broad notion of

[4] Benchmarking Analysis: Environmental Security Academic Units. Prepared for the Virginia Tech College of Natural Resources and Environment 2019. Hanover Research (14pp).
[5] Ten Types of Innovation. The Discipline of Building Breakthroughs. 2013. Keeley, L., R. Pikkel, B. Quinn, and H. Walters. Wiley. 288pp.

sustainability. The Center's mission, in contrast, is to: ***educate, inspire, and empower sustainability professionals to create a better future for people and our planet***.

- **Mission Context:**

  Natural resources management has undergone paradigm shifts over the last several centuries. These shifts have occurred as the perception of resource abundance has changed, as the need for active management has increased, as the environmental costs of resource extraction and use have become better understood, and as systems thinking has exposed the depth of interdependencies and complexities. They are summarized below:

  - Abundance/Inexhaustible: Early U.S. history of exploiting nature to fuel the economy, build a nation, and enable democracy. To waste was a virtue. Frontier ethics dominated. There was a sense of boundlessness and infinite resources.
  - Efficiency: Early 20th century. A response to exploitation and a sense of the finite. Maximize sustained yield of resources upon which economy and democracy depended, e.g., wood, water, wildlife, recreation. Scientific management and conservation policies begin under the likes of Gifford Pinchot, first head of the U.S. Forest Service (1905).
  - Resiliency: Mid to late 20th century to some point in the future. Ecological thinking about dynamic, complex, adaptive systems. Natural resources become embedded in larger frames: ecosystem services, biodiversity, climate change, nonpoint pollution. The philosophy of Aldo Leopold (e.g., Leopold, A. 1949. *A Sand County Almanac, and Sketches Here and There*. New York: Oxford Univ. Press). Modern environmental laws and civil society appear.
  - Security: Emerging now. The academic field of environmental security is emerging, in part, because of systems-level challenges. Challenges such as climate change, poverty, inequity, forced migration, resource scarcity, pollution, and species extinction are deeply interconnected and require systems-level responses. These interdependencies create a whole new class of risks that challenge nations and businesses to manage. Global supply chains must be assessed and managed for disruption. Nations must prepare for threats from failed states and climate refugees. Utilities, infrastructure, and public health become vulnerable to climate change. Political conflicts within and between regions, cities, and nations get triggered by water that flows across political boundaries and threats to food systems. Tensions between nationalism and globalism add political instability to natural variability of resource flows. Threats to human rather than "natural" systems are emphasized. A "systems perspective" must be used to mount successful responses.

This shift to a security framing is a shift in how we view environmental challenges. There is, now more than ever, the need for leadership and management from a new and highly integrated systems perspective. Climate change is the thin end of a larger wedge that puts at risk human institutions, whether those institutions are local communities, supply chains, cities, livelihoods, national governments, or human prosperity more broadly. It is in this space that the School of Environmental Security will focus. There are three primary perspectives on environmental security: state-centric, human-centric, and bio-centric. There is merit in all three, and in fact the School's programming will touch on all three. However, the School's primary focus and distinguishing feature will be on securitizing humans and their institutions.

Two examples from Argentina may help illustrate these differences and the focus of the school.

- Mendoza Province in Argentina is the dominant wine-growing region of the country and one of the most important wine regions in the world. It is also home to nearly 2 million people. It is also a desert. Drought, climate change, and population growth threaten the available water supply. In turn, this threatens the human institutions of Mendoza: the city, its industries, the people's livelihoods, and the 500 years of cultural history in that place. The research and outreach talents and expertise of the CNRE could be marshaled to manage this existential situation under the banner of the School of Environmental Security.
- Contrast that with the Argentine city of Bariloche. Surrounded by the Nahuel Huapi National Park, this region of Patagonia faces a list of threats: climate change, invasive species, biodiversity loss, and landscape degradation. The human impacts on this region are clear. However, the impacts on humans are less compelling. Humans are tangential to the conservation narrative. The CNRE could likewise contribute expertise to addressing the challenges in that place, but it would not be an environmental security intervention.

A natural question that might be posed is, "Why does the CNRE require a new school to address these challenges? Isn't it already working in this space?" The answer can be demonstrated with two examples.

The first is Virginia Tech's own proposed National Security Initiative (NSI). While there is research, teaching, and outreach occurring across the campus with national security implications, the university is without an umbrella organization that can cohesively represent the university's capabilities to external audiences. The NSI, like this proposed school, will provide a mission-oriented entity, capable of coordinating academic efforts and of signaling an identity and emphasis to prospective students, funders, and partners.

The second example is from Columbia University, with its new Climate School. The director of Columbia's Earth Institution, which houses the new school, noted that: "If climate is part of the curricula and research programs of so many parts of Columbia, you might ask 'Why do we need a new school?' At present, we do not have a central, strategically focused coordinating structure and mechanisms for developing education,

research, technology and policy hubs related to climate. The Climate School will provide that."

Likewise, the School of Environmental Security can provide the structure and mechanisms for coordinating and raising the profile of CNRE research efforts (and others across campus), offering new educational opportunities, and brokering new partnerships with stakeholders hitherto untapped by the college.

- **Benefits sought by creating the new organizational structure**
    - The School offers a different approach from previous schools at Virginia Tech (the exception is the School of Medicine). Form follows function in this case, with the goal being the sustainable development of a new institutional home for the college's aspirations in the environmental security space and in the DC area. Unlike prior schools that consist of a combination or rearrangement of existing departments into a new entity, the School is instead focused on providing the educational goods and services necessary to meet a particular thematic goal—*environmental security*. This user-centered design approach looks to meet the needs of professionals working now and in the future within the rapidly emerging environmental security space. As the School is not an amalgamation of several existing departments, but rather is an integrated approach to the topic of environmental security, there exists no structure within the CNRE by which the teaching, research, and development goals of the School might be otherwise met. The CNRE is simply not currently at the scale in which it can fully take advantage of opportunities in the DC area; the School is the vehicle to achieve scale.

As such, the School aspires to provide professional graduate educational products, including both master's and doctoral, and will eventually include both an applied research hub and a focused innovation/decision outreach mechanism. Specific benefits include:

- CNRE growth and positioning in the DC area, and leveraging an enhanced presence and reputation to build partnerships, recruit students, and actualize both research and development opportunities
- Contributions to Top 100 Global status via research squarely focused on environmental challenges in a <u>global</u> context
- New experiential learning and global learning opportunities for graduate and undergraduate students
- Leveraging the CNRE's expertise within a newly emergent and cohesive vision better able to effectively compete for resources and more diverse funding opportunities
- Operationalizing transdisciplinary approaches in both the structure of the School and the programs it will house
- Vastly expanded opportunities to partner with industry and government agencies

- Preparing graduates for the opportunities of emerging environmental security vocations, across a wide assortment of employment sectors and disciplines.

5. Proposed Organizational Structure

- The proposed School will be a unit within the College of Natural Resources and Environment. The School Director will report to the Dean of the CNRE.

- Internal Organization of the School
  - Administrative leadership will be provided by a Director and a Senior Associate Director. The contemplated Innovation/Decision Studio (Appendix 2) will require a new Assistant Director for Leadership and Innovation. The School will have two organizational sub-units – the Center for Leadership in Global Sustainability and the Center for Geospatial Information Technology.
- Promotion and Tenure/Annual Evaluation:
  - No changes to the standard college procedures are expected or suggested.
- Identify any additional resources needed to create the administrative organization of the proposed school and provide justification for these resources.
  - Will the school require an additional financial/budget officer?
    - No.
  - Will the school require a development officer?
    - No. That function will be part of the CNRE development purview.
  - Will the school require an information officer?
    - No. Marketing services will be provided by existing staff within the Center for Leadership in Global Sustainability, and communications is the purview of the CNRE.
  - Will the school require associate or assistant directors?
    - Yes. The positions of School Associate Director and Assistant Director for Leadership and Innovation will require administrative/professional salary lines.
  - What additional staff resources and operating budgets would be required to support any new positions?
    - Current Center for Leadership in Global Sustainability staff resources will be adequate for the School's administrative needs for the first 1-2 years. In out years there may be the need for an additional program coordinator.
    - The current operating budget provides adequate funding for the proposed School. Enrollment growth and the Enterprise funding model will provide any new resources needed for the School's growth and expansion.
- Develop a proposed operating budget that reflects both current operations and any new financial resources required to create the new school.
  - See Table 1.

6. Describe the academic programs (including instruction, research, and outreach) that would be offered or conducted by the proposed school. If recent program review documents are available, they may be submitted to respond to the relevant questions below.
    - Describe the program priorities for the school in terms of instruction, research, and outreach missions.
        - The School will initially prioritize instruction. This is a natural progression from the success of the existing professional master's degree the CNRE (Master of Natural Resources) has been offering in the DC region for more than two decades. This will manifest as a new *Master of Professional Studies in Environmental Security* being developed contemporaneously with the school. Experiential opportunities for undergraduates in the DC area, and a non-Ph.D. doctoral program, are additional instructional opportunities presented by a new school. As the School matures (years 2-4), it is planned and expected that its programming will expand to explicitly include both applied research and outreach, the former via a planned environmental security research cluster with its own dedicated staffing. The cluster would offer a mechanism for all CNRE faculty to better access sponsors in the environmental security space, as well as collaborate with the university's pending National Security Institute. Outreach will come alive via an Innovation and Decision Studio that has begun tentative design (see Appendix 2). For the immediate future, however, instruction will be the primary emphasis of the school.

    - Using historical enrollment data and enrollment projections, describe the past and projected enrollments in the units that will be part of the proposed school. Relate those data to overall University trends.
        - The pertinent enrollment data is drawn from the current Master of Natural Resources (MNR) administered by the Center for Leadership in Global Sustainability. Performance of the MNR can be measured both by (a) enrollments in NR courses and the revenues generated, and (b) degree completions. Between 2011 and 2019, online enrollments in the MNR increased by more than 600% (Figure 1); revenue generation across MNR programs increased by more than 1000% (Figure 2). The number of degree enrollments and commencements in the last five years has consistently outpaced related and competing Virginia-based programs (Figure 3). During this time period, overall enrollment in graduate programs at the university has generally declined.

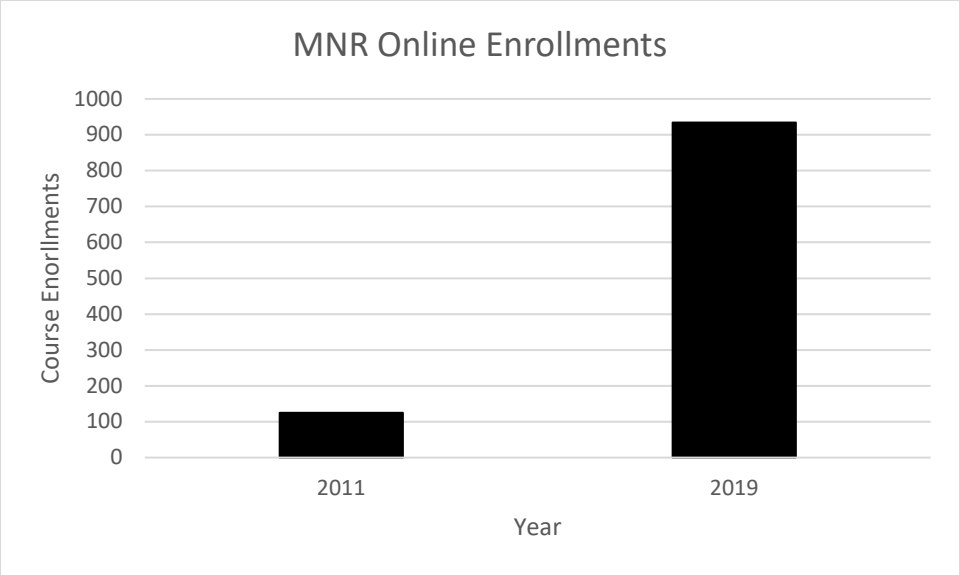


Figure 1. Comparison of MNR Enrollments

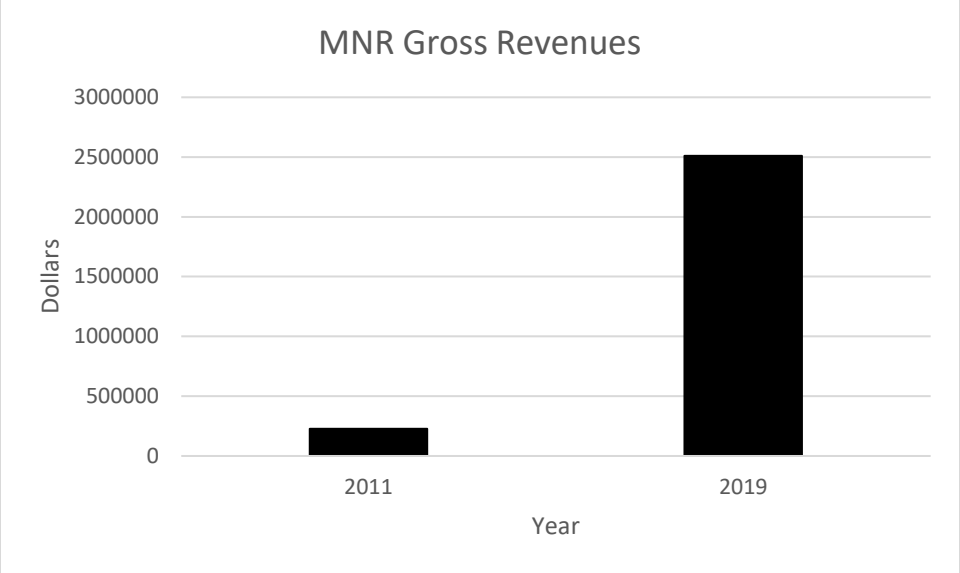


Figure 2. Comparison of MNR Tuition Revenues

Enrollments[6]	**Fall 2014**	**Fall 2015**	**Fall 2016**	**Fall 2017**	**Fall 2018**
Christopher Newport University	29	30	19	26	16
Virginia Commonwealth University	38	36	34	27	24
Virginia Tech (MNR)[7]	*83*	*94*	*74*	*90*	*98*
Degrees Awarded[8]	**2014-15**	**2014-15**	**2016-17**	**2017-18**	**2018-19**
Christopher Newport University	8	11	7	12	7
Virginia Commonwealth University	21	13	13	18	5
Virginia Tech (MNR)	*54*	*68*	*53*	*55*	*55*

Figure 3. **Enrollments and Degrees Awarded at Comparable Programs in the Commonwealth**

Enrollments in the MNR are expected to increase in the next five years. Available data also suggests that new master's degree platforms in the broad space of sustainability and the environment within the School are likewise market-driven and should demonstrate high demand (see below). Projected enrollments in the School's future academic programs should follow on the historic enrollments and enrollment growth in the CNRE's existing Master of Natural Resources. The MNR currently enrolls 124 online students and 35 executive students. We might expect enrollments in the proposed Master of Professional Studies in Environmental Security masters to achieve 25 students in year 1, 30 in year 2, and 35 in year 3, reaching a likely plateau of 50 students/year by year 5.

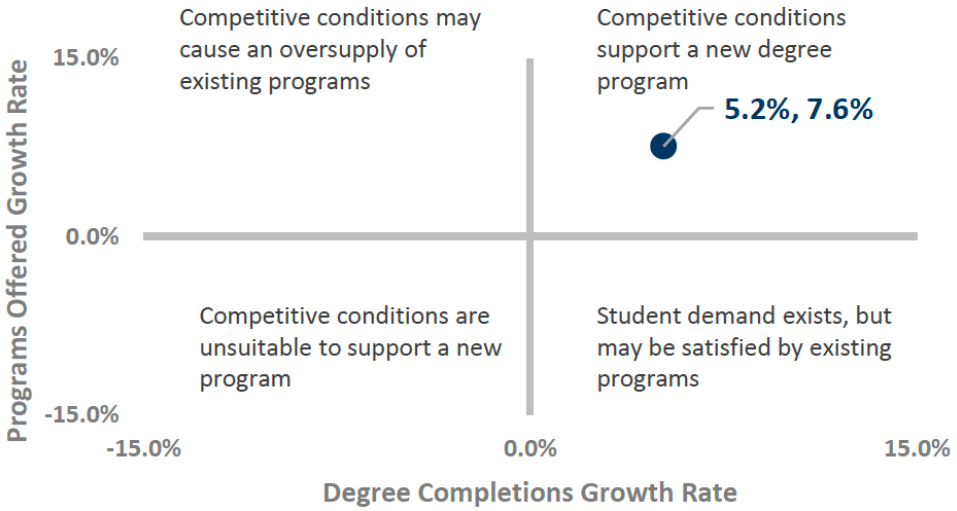
[6] State Council of Higher Education for Virginia (SCHEV). *Fall Headcount Enrollment by Race/Ethnicity, Gender and Program Detail.* http://research.schev.edu/enrollment/E16_Report.asp. (Accessed January 30, 2020).

[7] Virginia Tech's Master of Natural Resources (MNR) is included for comparison. The Master of Global Sustainability, which will ultimately replace the MNR, should reflect similar numbers initially, and higher over time due to the broader potential student audience.

[8] State Council of Higher Education for Virginia (SCHEV). *Completion, Program Detail C1.2.* http://research.schev.edu/Completions/C1Level2_Report.asp. (Accessed January 30, 2020).

National Market Saturation (2013-2017)

Within the nation, do competitive conditions support an additional master's in sustainability degree program?



Source: Benchmarking Analysis: Environmental Security Academic Units. Prepared for the Virginia Tech College of Natural Resources and Environment 2019. Hanover Research (14pp).

- Describe how the creation of the school will affect faculty workload and productivity in the component units.
    - The instructional needs of the new master's degree will require a new cohort of adjunct faculty that, like the MNR faculty, will be recruited to meet the needs of specific courses. Existing CNRE faculty may also play instructional roles.
    - We expect the creation of the School and its applied research hub will enable faculty members to increase collaborative and transdisciplinary research with faculty colleagues from the participating units within the CNRE, as well as with other colleges, and perhaps most importantly with environmental stakeholders and partners outside of Virginia Tech.

- Describe the programs offered and trends in the degrees awarded for these programs.
    - See above for description of the existing Master of Natural Resources degree.
    - New degrees and degree formats are contemplated, all in the professional degree (self-sustaining professional program) space, and are described below.

- List and describe any anticipated major changes to the academic programs such as new degree programs, options or concentrations to be proposed; merger of programs/degrees; of discontinuance of degrees/programs (proposed changes to academic programs would need to be reviewed separately through usual governance

procedures). Estimate the effects on enrollment and resources if such changes are implemented.

- In addition to the existing Master of Natural Resources degree (to be modified to Master of Professional Studies in Global Sustainability in 2021), we anticipate the development of new graduate courses supporting both the new Masters of Professional Studies in Environmental Security, and the possibility of a professional, non-PhD doctoral degree focused on environmental security. Enrollment projections would be entirely speculative for any of these changes at this moment; because all the graduate offerings of the School are self-sustaining professional programs, there would be no resource requests of the CNRE or the university. The programs would only proceed if enrollments were sufficient to fund the operations of the programs.

- Describe changes in the nature, quantity, or interdisciplinarity of the research, scholarship, creative expression or artistic performances of faculty in the component departments/programs that might be anticipated by establishment of the school.
  - The emerging field of environmental security is inherently transdisciplinary. The challenges are large scale, transboundary, complex, and require coordination of differing stakeholders. Tools such as analysis, education, leadership, and innovation will need to be brought to bear on challenges that will include natural resources, national security, governance, economics, politics, and culture. By focusing the talents and expertise of the CNRE on a critical class of problems, we can expect the School to expose additional sponsored research opportunities. A new applied research hub to broker, facilitate, and expand CNRE sponsored grants and contracts will focus on the diverse stakeholders in the DC area (and elsewhere) with organizational environmental security research needs.

- Describe changes in the nature, quantity, or interdisciplinarity of the outreach and continuing education of faculty in the component departments/programs that might be anticipated by establishment of the school.
  - The School's focus creates new opportunities for industry partnerships that the CNRE has historically been unable to tap. Experiential learning opportunities for students are expected to likewise increase. Finally, the proposed Innovation/Decision Studio will create opportunities for stakeholders from diverse sectors to collaborate on social innovation and other problem-solving approaches to real-world, real-time problems.

7. Proposed Evaluation Criteria

- Using the general guidelines provided in the policy document, state the evaluation criteria that will be used to assess the success of the new school in achieving the benefits that are sought be its creations.
  - Policy 6150 states: "Reviews will be guided by the school's objectives and implementation plan, as well as by the relationship of the school's goals to the University Plan. Demonstrable evidence of accomplishments must be

included in both the internal and external reviews. The evaluation will emphasize the degree to which the school has met the criteria and benefited the institution, with evidence such active involvement of a critical mass of interdisciplinary faculty and students; contributions to enriching the education of students; effective interdepartmental collaboration with respect to teaching, research, and public service activities; and increased access to external resources. In addition, the review will address issues of administrative effectiveness and efficiency and fiscal management."

- The School will participate in the University's Academic Program Review at least every five years to provide a systematic review for fostering continuous improvements.
- The School will be subject to an annual report to the College of Natural Resources and Environment. The report includes a summary of faculty performance evaluations, unit achievements, and summary of school highlights.

8. Provide any additional materials or information pertinent to the proposal

   Appendix 1. Proposal for a Partnership to Address Environmental Security in the Sundarban Region of India and Bangladesh

   Appendix 2. Description of the Innovation/Decision Studio

Table 1. College of Natural Resources and Envrionment
School of Enviromental Security
Anticipated Resource Model

Annual Operations	**Amount**	**Fringe (FY'21 Provisional Rates)**	**Total**
Human Resources			
Faculty Resources:			
Administrative/Professional Faculty	888,500	304,311	1,192,811
Stipends	30,000	10,275	40,275
Staff and Adjunct Faculty:			
Program Coordinator (staff)	63,000	34,288	97,288
Program Associate (staff, new)	50,000	26,375	76,375
Adjunct Faculty	525,000		525,000
Operational Resources			
	Actual		**Estimate**
Offices:			
Office Rental	50,000		50,000
Misc. Space Costs	5,000		5,000
Operational:			
Equipment	15,000		15,000
Travel	100,000		100,000
Supplies	3,000		3,000
Contractual Services	100,000		100,000
Executive Program Delivery	1,590,000		1,590,000
Anticipted Annual Operations			**3,794,749**
One-Time Investments			
Hanover research	30,000		30,000
Innovation Lab research	20,000		20,000
Branding, business cards, etc.	10,000		10,000
Anticipated one-time investments			**60,000**
Grand Total			**3,854,749**

Appendix 1.
Proposal for a Partnership to Address Environmental Security in the Sundarban Region of India and Bangladesh

Context
The Ganges-Brahmaputra-Meghan (GBM) Delta (see image below) is one of the largest and most densely populated river deltas in the world. Draining watersheds in Bangladesh, Bhutan, China, India, and Nepal, the delta region is home to some 147 million people. The delta's two mega-cities, Kolkata (India) and Dhaka (Bangladesh), have metropolitan populations of 15 million and 20 million respectively. Elevation in this region does not typically exceed 10 meters. The Sundarbans, the southernmost region of the delta, extends across India and Bangladesh and spanning some 3,900 square miles is a network of islands comprising the world's largest mangrove forest. The Sundarbans is not an untouched wilderness, regardless of any conservation designations on a map. Some 13 million people live and make their livings there from resource exploitation and other activities.

Threats and Risks
From the environmental security perspective, human institutions in the GBM Delta are squarely at risk. The threats are varied but related (Figure 4). There is an existential threat to the Sundarban ecosystem, an ecosystem at the heart of the "natural wall" protecting this low-lying region and its tens of millions of human inhabitants. Loss of the functions of the Sundarbans will not only threaten the livelihoods of the 13 million residents, but it will also expose the many millions further inland to the threat of recurrent inundation. Already there are tensions between the two countries in this region, to which the India-Bangladesh Border Wall, stretching more than 2,500 miles, testifies. Any large-scale human migration, be it from any combination of climate/economic will test that border in ways that may not be welcome.

The environmental threats include:

- Climate change
  - ⇒ Sea-level rise which brings both flooding and saltwater intrusion
  - ⇒ Storm surges from the Bay of Bengal
- Subsidence
- Resource over-exploitation in both forests and fisheries
- Declining ecosystem integrity that includes both biodiversity loss and pressure on threatened and endangered species
- Land use conversion from relentless development pressures

Opportunities and an Approach
Environmental security requires an active systems approach to interventions, one that works across both disciplines and sectors. It would require a combination of education, research and outreach, for which a global land grant university is uniquely well-suited. In this case, however, partnering will be required to effectively address the complexity of threats and stakeholders.

The partners might include:

- South Asian Forum for Environment (SAFE) provides local knowledge, social infrastructure, and a deep understanding of participation and behavior change techniques in local communities

- The College of Natural Resources and Environment (CNRE) can provide expertise in: GIS, forestry, coastal risks, leadership, agroforestry, fisheries, human-wildlife conflicts, urban encroachment, climate science, wildlife conservation, and aquaculture

- The ITC corporation can provide perspective, resources, and knowledge of supply chain risk

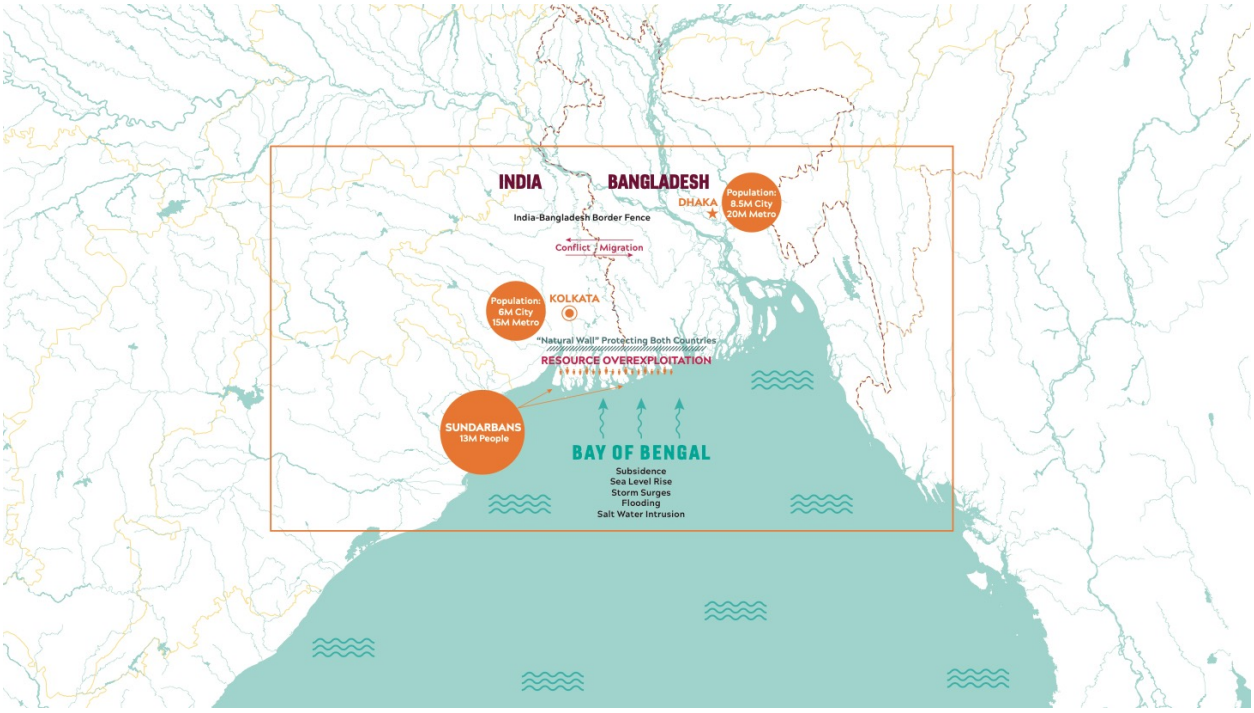


Figure 4. Threats and Risks to the Sundarbans

Appendix 2.

College of Natural Resources and Environment
School for Environmental Security
Innovation & Decision Studio

Environmental security challenges are so complex, not just technically, but in terms of the inter-relationship among factors such as geophysical scale, jurisdiction, and stakeholders, to name a few, that they are often only amenable to solutions developed via collaborative innovation.

The SoES *Innovation & Decision Studio (IDS)* will be the national center of excellence for the development of collaborative innovation solutions to environmental security challenges.

The Studio provides all means necessary for multi-sector stakeholders to convene and develop solutions to complex environmental security challenges which not only address the complexity but also have the greatest probability of successful implementation by blending human centered design, evidence-based environmental options, and research-based group dynamics processes with advanced analytic models and data visualization.

People, Processes, Tools, and Facility SoES's *Innovation& Decision Studio* will be a combination of people, processes, tools, and a facility that convenes stakeholders virtually and face-to- face, synchronously and asynchronously, to address broad significant threats to society arising from large scale persistent environmental changes.

Experts in team dynamics, group decisions, data analysis and visualization as well innovation and human centered design processes will design and facilitate activities to guide groups to optimal results.

It will be designed to explicitly support collaborative innovation group processes. It will maximize the flexibility with which the facility can be rapidly reconfigured to accommodate easy transition from large group plenary activities to small workgroups and back again.

Solutions, Products, and Research

Outcomes of work completed in the IDS will include proposed solutions such as policies, business models, services, and product designs. In addition, the IDS will provide a rich field for advancing the practice of Social and Collaborative Innovation, Group Decision Processes, and Creativity. The Studio should be expected to produce new intellectual property of value to Virginia Tech in the form of whitepapers, peer reviewed journal articles, business opportunities based upon participation in innovation sessions which create novel business models or services and product designs.

Capability Comparisons and Contrasts

There are a couple of existing university examples with which the IDS can be compared and contrasted: University of Virginia's "Learning Studio" and Arizona State University's "Decision Theater." Of course, Virginia Tech's Applied Research Corporation Center has some capability with which the IDS can be compared as well.

While the IDS will have capabilities and may be configured similar to UVA's Learning Studio, it has different purposes and processes. The Learning Studio, a technology-enabled, active-learning (TEAL) classroom, was designed for the Next Generation curriculum. This interactive learning environment uses the latest technology to engage students in active learning. This space incorporates the five modalities of adult learning. Five technologically sophisticated screens – each measuring 20 feet across – descend into the space and tie into each group table, so that students can share with a small group or the entire class. Most sessions are recorded and are easily retrievable by podcast and on the web.

Figure 1 UVA's Learning Studio

Figure 2 ASU's Decision Theater

And while the IDS will have some capabilities similar to ASU's Decision Theater, its configuration, focus, and processes differs. The Decision Theater brings together stakeholders to address complex, cross-disciplinary problems, offering data visualization, predictive modeling, and expert analytics to enhance all stages in the decision-making process.

SoES's IDS will be configured more like the Learning Studio with capabilities similar to ASU's Decision Theater, but it will be designed to support large-scale multiple stakeholder groups and subcommittees in collaborative social innovation processes, policy formation and evaluation, and decisions.

Design Features may include:
6 zones of multiple microphones (overhead or table-based) – 1 per Pod to support local and web-casting audio.
Pod-based wireless speaker (1 per Pod) to receive any combination of or all Pod Zone audio and/or Speaker/Panelist audio.

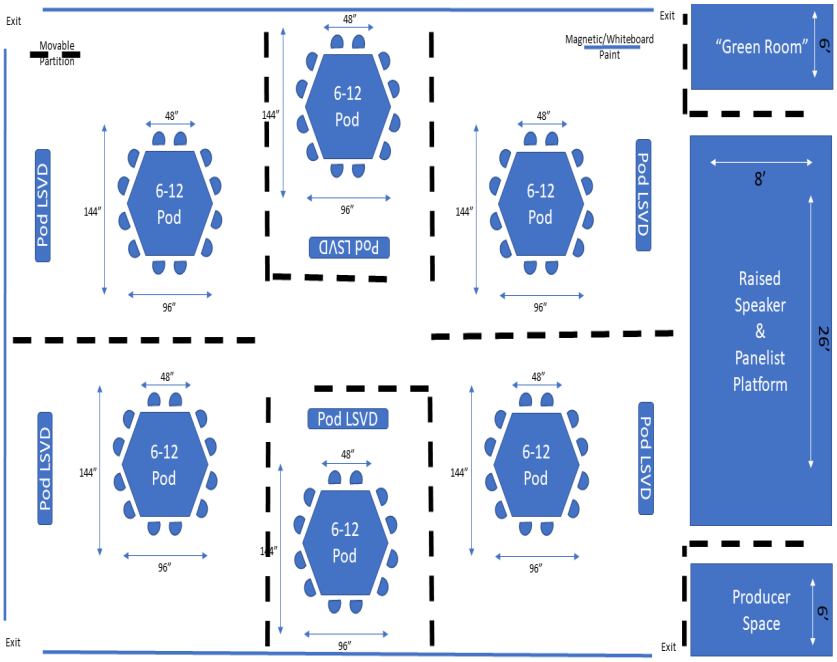
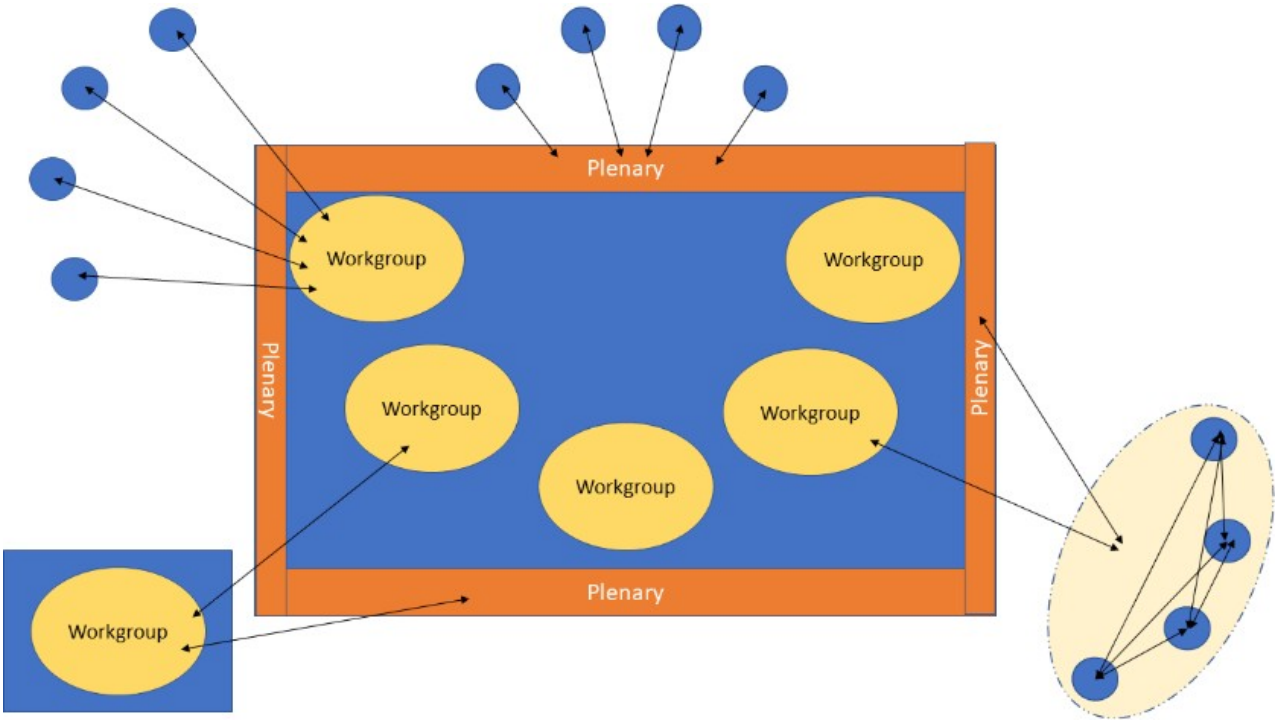


Table-based 360 video camera to push internal to room and external to room via Web Video conferencing.
Movable Pod Large Screen Video Display (LSVD) or Short-throw Project/Screen Combination – 1 Per Pod.
“Movable Panels”/”Soundproof” curtains (ability to divide total space into 6 Pod Zones).
Pod Zone Lighting/Controls.
Pod and Producer control of Pod’s audio and video on/off/mute as well as broadcast to other Pods or room-based.
Producer ability to mute any combination of Pod’s audio (Producer controlled “Audio Focus”) for presentation to room.
Producer and Pod ability to push any individual’s computer screen to any or all other Pod’s collection of computers or LSVD as well as whole room-based video positions.

Collaboration Operating Modalities included are depicted below:



COLLEGE OF NATURAL RESOURCES AND ENVIRONMENT
VIRGINIA TECH
CENTER FOR LEADERSHIP IN GLOBAL SUSTAINABILITY

Virginia Tech Research Center-Arlington
900 N. Glebe Road
Arlington, VA 22203
Phone: 571/858-3338

October 26, 2020

To Whom It May Concern:

I am writing to express my support for the establishment of a "School of Environmental Security" within the College of Natural Resources and Environment in the greater Washington, DC, metro area. It is expected that the School will provide new opportunities and pathways for the College of Natural Resources and Environment in graduate education, applied research, outreach, and philanthropy.

Sincerely,

Michael J. Mortimer
Director
Center for Leadership in Global Sustainability

COLLEGE OF NATURAL RESOURCES AND ENVIRONMENT
VIRGINIA TECH

Office of the Dean
310 West Campus Drive
Cheatham Hall, Room 324
Blacksburg, Virginia 24061
P: (540) 231-5555 F: (540) 231-5555
cnre@vt.edu

October 23, 2020

To Whom It May Concern:

We write to express our support for the establishment of a "School of Environmental Security" within the College of Natural Resources and Environment to include existing professional degree programs, a new professional master's degree in environmental security, and physically located in the greater Washington DC metro area. We believe that by establishing the School of Environmental Security in the greater Washington DC metro area, Virginia Tech has the opportunity to attract a significant number of students seeking professional degrees in Environmental Security who would otherwise not seek to further their education or seek opportunities at other institutes of higher education.

Sincerely,

Dr. Tom Crawford
Chair & Professor
Department of Geography

Dr. Ching-Hsun Huang
Head & Professor
Department of Sustainable Biomaterials

Dr. Joel Snodgrass
Head & Professor
Department of Fish and Wildlife Conservation

Dr. Jay Sullivan
Head & Professor
Department of Forest Resources and Environmental Conservation