AS.420.705 Natural Resources Sustainability: Field Study in Alaska, August 2020

“I truly believe that we in this generation must come to terms with nature, and I think we’re challenged as mankind has never been challenged before to prove our maturity and our mastery, not of nature, but of ourselves.” Rachael Carson

“Only when the last tree has died and the last river been poisoned and the last fish been caught will we realize we cannot eat money.” Cree Indian Proverb

“We abuse land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect.” Aldo Leopold

“Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it is the only thing that ever has.” Margaret Mead

Course Description:

This interdisciplinary field-based course will examine natural and cultural history, and resource management in the varied ecosystems of Southeast Alaska, centering on the fishing town of Sitka, located on Baranof Island, southwest of the capital Juneau. Through class lecture/discussion and field day trips, students will learn about the region’s marine and terrestrial environments, better understand integrated resource management and sustainability in protected areas and learn options to address various anthropogenic impacts to habitats and species. The course will synthesize concepts from a variety of disciplines including marine and fisheries science, conservation biology and ecology, wildlife management, geology, energy resource management, climate change, forestry, botany, environmental policy and advocacy, Tribal cultures, and eco-tourism.

Prerequisite: Course in Principles of Ecology or Sustainability Science

Our Approach:

Sitka is situated in the Tongass National Forest — the largest of our U.S. national forests at 16.7 M acres — and spans several ecozones from open ocean to alpine. As the Tongass is currently under attack by the current administration, it provides
numerous opportunities to assess options for exploitation versus conservation. As an island, it is relatively isolated and off the mainland power grid which provides for unique social interactions and a distinct community, but as an island in the temperate rainforest it is also more fragile and dependent compared to mainland Interior Alaska. Sitka will provide us a unique laboratory to assess sustainability, and allow us to see the big picture, as well as complex, resource intensive transformations in a small place where local priorities and needs abut global economic challenges. This course will take advantage of the quintessential coastal Alaskan environment to create an interdisciplinary and experiential approach to learning. By taking advantage of nature’s backdrop, we’ll be able to participate in a diverse variety of fieldwork varying from field trips around Baranof Island addressing issues related to energy production, safe drinking water acquisition, waste management, resource utilization, and wildlife conservation; to hands-on data collection of whale density and whale identification, seal and sea lion identification, invertebrate biodiversity in kelp forests, to marine plastic pollution identification and assessment — among various other activities.

Instructors:
This team-taught interdisciplinary course will feature local experts as well as the following faculty to provide a consistent academic thread throughout the course.

W. Beer-Kerr, MS  email: wbeerke1@jhu.edu
J. L. Burgess, Ph.D.  email: jerry.burgess@jhu.edu
A. M. Manville, Ph.D.  email: amanvil1@jhu.edu

Phone: 410.704.4729 (Baltimore) or 202.580.7562 (DC) or 443-598-2585 (Google Voice)

Office Hours:
By appointment onsite in AK and after the course in Baltimore or DC.

Course Textbook:
- Sustainability: A Comprehensive Foundation. 2015. OpenText

Program Learning Goals:
Among our learning goals, we will identify root and structural causes as well as the systemic nature of environmental problems (e.g., loss of salmon and other fisheries and salmon relationships to forest integrity), learn how to critically interpret environmental data and information (e.g., ecosystem vulnerabilities to climate change), synthesize scientific studies (e.g. the impacts of historic whaling on ocean communities including Steller’s sea lions and Pacific herring), integrate basic principles derived from your core courses (e.g., role of geology in sustainable energy), and lastly examine sustainable management in environmental systems (e.g., wilderness preservation in the temperate
rainforest; and sustainable harvest practices for salmon, herring, forage fish, and shellfish). No view or opinion is unimportant. Make your voice heard. Please be prepared to discuss issues, ask and answer questions, and provide feedback. We expect each of you to actively participate in class discussions including in the field, at social events at the Sitka Fine Arts Center, and at informal get-togethers in the evenings.

**Specific Learning Goals:**
1. Critically analyze the practical, social, political, and ethical issues that shape how our human population relates to and handles (e.g., exploits vs. protects) its natural resources, including those appropriate to the coastal Alaska Frontier. Be able to identify and discuss costs and benefits, and discuss issues related to resource sustainability, subsistence harvest, and their impacts on society, flora and fauna, habitats, and human history.
2. Understand and learn to apply technical knowledge acquired from relevant field methods by critically evaluating data, learning how these data are used to solve real-world problems in conservation science, wildlife management, and ecology.
4. Analyze the intersection of conservation, policy and natural resource use and management in the context of sustainability and conservation science.

**Course Requirements:**
1. **Pre-Trip Readings & Meetings:** There will be 1 Zoom meeting (date TBD) to discuss in a Socratic Setting some of the readings and trip logistics. Background readings will be provided in the eReserves section of Blackboard or will be emailed to class participants.
2. **Onsite Evaluations:** Students should be prepared for rigorous question and answer forums based on prereading materials and information learned on site.
3. **Onsite Journal Observations:** Students will be asked to take notes and reflect on learning experiences, pertinent key “take homes,” and sites visited at selected times. Although a hard bound journal is acceptable, we will encourage the use of Aps such as Open Data Kit (ODK) Collect.
4. **Class Participation:** Students should show up on time, be familiar with the issues for each day, and be well-prepared to actively engage during all site visits, field stops, excursions, and use of field methods. Students are expected to be engaged and ready to ask and respond to questions and share thoughts and ideas about the readings as these relate to the sites we will be visiting. Several day trips will involve data collection and some post-field data processing. As much as possible, we will plan to conduct regular briefing and debriefing sessions to discuss what we are being exposed to and what the findings may mean.
5. **Conference Presentation:** Students will synthesize and present the details of an agreed upon research topics. Topics must be broadly related to natural
resources and sustainability and will be discussed with faculty prior to initiation. This timed presentation will take place on Tuesday the 11th and will be open to the public and other researchers. Presentations will be done in scientific conference presentation style. Ideas and topics will be presented on the first academic night on campus so students are encouraged to engage with faculty beforehand.

**Grading Policy:**
Your semester grade will be determined by the percentages and format below. We will follow the grade scale used by JHU*.

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage of Total Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-trip Assignments &amp; Exam</td>
<td>10%</td>
</tr>
<tr>
<td>Daily Field Journal Reflections</td>
<td>20%</td>
</tr>
<tr>
<td>Class Participation (including field synthesis activities)</td>
<td>50%</td>
</tr>
<tr>
<td>Conference Presentation</td>
<td>20%</td>
</tr>
</tbody>
</table>

*Late work is not accepted.

**Safety, Health, and Mobility:**
Good health and mobility are essential (we will be on the move in this course, and hiking ability is expected). An openness to a cross-cultural experience is also necessary. Every effort will be made to accommodate students with any special health and dietary needs including but not limited to gluten intolerance, food/shellfish allergies, bee sting sensitivity, vegan requirements, special medical issues, and any special medicine/Rx needs. We will be in the heart of brown bear (aka, coastal grizzly) habitat so responsible hiking and backcountry etiquette will be important — which we will address before the field portion of class begins. Please do **not** bring bear spray with you; it is prohibited on all commercial aircraft as either carry-on or in checked luggage. We and the daily field experts will carry bear spray for the group.

**Accommodations:**
Double-occupancy dorm rooms (students paired up according to gender) at the Sitka Fine Arts Camp, Sweetland Hall, which is conveniently located several minutes away and across campus from the Sitka Sound Science Center, and a short walk (~10 minutes) from most venues in town. We will eat at the Fine Arts Center’s Sweetland Hall dining room, with a large auditorium and complete kitchen facilities for meals, unless otherwise noted on the schedule. We will each prepare and take brown bag lunches while in the field, made up after breakfast each day except on the excursion to St. Lazarias National Wildlife Refuge.

**TENTATIVE COURSE SCHEDULE** — field excursions subject to change based on weather, sea state, and expert availability.

**Pre-field Class Schedule:**
May 24-July 31, 2020
• Pre-trip meetings, readings, videos, exam, and research

*All breakfasts and the majority of dinners will be provided at Sweetland Hall. All lunches will be boxed.

Field Class Schedule:
Monday, August 3rd
• Arrival in Sitka. Transportation provided from the Rocky Gutierrez Airport (SIT) to Sitka Fine Arts Camp dorms.
• Get Settled into dorms. For those arriving earlier, there will be options to explore the town, go for a hike, rent a bike, or get lunch on your own while we wait for everyone to arrive.
• Dining Hall Dinner
• Group introductions, welcome and orientation

Tuesday, August 4th
• Morning: Mt. Verstovia hike – Nature journaling, sketching and panoramic views
• Afternoon: Sitka Walking Tour—Overview of the community
• Lecture on socio-political history of SW Alaska
• Dinner on your own in town

Wednesday, August 5th
• Morning: *Intro to Southeast Alaska Terrestrial Ecosystems*: Students will hike the Indian River Trail system to experience local ecosystems firsthand and see up-close upstream migration of 3 species of Pacific salmon (provided timing and conditions are suitable). The trail provides a typical Tongass National Forest hike: near/next to a river, often muddy and adjacent to lovely muskeg ecosystems.
• Field methods: camera trapping, VHF radio tracking, quadrant ground cover vegetation sampling, tree canopy estimation (size, DBH, biomass, and species), tree plotted strip census vs. plotless distance sampling, salmon stream count estimates, wildlife track/sign counts, Common Raven counts, and scat identification.
• Compare mature temperate rainforest tree stands to Starrigavan forest area that was recently logged.

• Afternoon: a series of guest lecturers from representatives of land management agencies with a brief panel discussion following, open to Q&A. Trail and conservation groups, and wildlife and land-management agencies (e.g., USFS, USFWS, USGS, Natural Resources Cons. Service, AK Dept. Fish & Game Wildlife Division, and AK Dept. of Conservation) can provide round table discussions on community, ecological sustainability and land management. Discussion topics will include forest usage and policy development.
• Dining Hall Dinner

Thursday, August 6th
• **Morning: Dock Tour:** Students will meet, talk with and get hands-on experience from local commercial fisherpersons, learning the differences in gear type, seasons, and techniques between gillnetters, purse seiners, trollers, trawlers (used more in the Aleutian Island pollock fisheries), large-scale longliners, and pot and trap fisheries (especially for dungeness crabs in SE Alaska, but prevalent in the Bering Sea). They will also hear the different political and social issues that each gear group faces and their attitudes about fisheries conservation, the business of fishing, local vs. international seafood, problems with derelict gear, environmental challenges including paralytic shellfish poisoning, and how local fishers connect with the community.

• **Afternoon: Introduction to Fisheries and Aquaculture:** Aquaculture has played a critical role in the history of Alaska’s commercial fisheries, including in SE AK. Here at the Sitka Sound Science Center we operate one of the oldest private salmon hatcheries in the State of Alaska. Our hatchery offers a unique opportunity for hands-on training and exposes students to the business and science of fisheries enhancement. University of Alaska Fisheries Technology faculty will lead students in a day of aquaculture, including learning basic hatchery systems and techniques, identifying the 5 species of Alaskan salmon, dissections, fish diseases, history and the art of fish culture.

• **Dining Hall Dinner**

---

**Friday, August 7th**

• **Morning: Fisheries Management Panel:** The management of fisheries in Alaska is complex. By state law, the Alaska Department of Fish and Game’s Board of Fish must manage for subsistence users, personal use, guided sport and commercial fishermen. Both the State and the federal government are charged with managing fisheries in Alaska for the common good, but fish do not abide by State or federal boundaries or regulations. Managing fisheries requires a detailed and thorough understanding of fish life cycles, stock assessments, perturbations that affect catch-per-unit-effort and stock yields (e.g., MSY), habitats and their changing conditions, diseases and invasive introductions, nano-plastics, and the influences of climate change (including warming waters, rising water levels, and increasing ocean acidity), as well as other external and internal pressures. This panel will provide varied perspectives on fisheries management, elucidate activities focused on responsible fisheries management, and provide opportunities to discuss larger issues related to common property natural resources.

• **Afternoon: Raptor Center** to see up-close Bald Eagles, a Golden Eagle, and other raptors being rehabilitated in a state-of-the-art rehab and recovery facility following injuries (e.g., wire and vehicle collisions, fishing gear entanglement, electrocutions, and lead poisoning) for release back into the wild or for use as education birds where release is not possible.

• **Evening:** **Pizza** (including vegan and gluten-free options) and a movie

---

**Saturday, August 8th**
• Early Morning: **Marine Mammal and Sea Bird Identification:** Participating students will learn how fieldwork, data collection and data analysis are connected, as well as how upper and lower trophic levels of marine ecosystems are connected. Students will take a chartered boat trip spending time with local whale experts, learning to identify whale species based on whale blows and caudal fin analysis, and will learn to identify individual humpback whales based on an existing Alaskan Fluke Identification Catalog, available online. Our group will go whale watching and take identifying photos which can later be compared to existing whale flukes in the Fluke Identification Catalog. Students will also receive a lecture on marine mammal ecology in the Gulf of Alaska and trends in population dynamics and status. A 15-mile boat ride away, 65-acre St. Lazaria National Wildlife Refuge (part of the USFWS’s Maritime National Wildlife Refuge system) looks like an enchanted island on the outer coast. Students will explore the fragile habitat of one of the most productive seabird colonies in the State of Alaska by cruising literally next to the Island’s steep cliffs. Because of the burrow-nesting habits of Storm Petrels, Rhinoceros Auklets, Ancient Auklets and others, and the risk of crushing their chicks and their tunnels which honeycomb the Island, we will not be able to actually disembark from our vessel. Only permitted USFWS and USGS scientists are allowed on the Island. More than 500,000 seabirds nest on St. Lazaria including — in addition to the above — Pelagic Cormorants, Common and Thick-billed Murres, Tufted Puffins, Bald Eagles, Glaucous-winged Gulls, Black Oystercatchers, and Peregrine Falcons, among others. This is truly a birder’s paradise; come add to your Life Lists! Laysan and Black-footed Albatross and Sotty and Short-tailed Shearwaters, as well as other species, feed in the nutrient-rich waters surrounding the Island. The mammalian predator-free situation (Bald Eagles, Common Ravens and Peregrine Falcons do prey on seabirds) and ideal soil-nesting and cliff conditions also make this a perfect seabird nesting site. The Sitka spruce is the only tree growing on the Island providing nesting habitat for at least 3 pairs of Bald Eagles.

• Field methods: Whale Population Estimate Analysis and Bird Diversity Surveys, Species-specific Circumnavigational Surveys for Pigeon Guillemot, Bald Eagle and Peregrine Falcon nest/chick counts, acoustic surveys for nesting seabirds and resident bats, and camera traps and photographic surveys.

• Afternoon: Macroinvertebrate Survey and Water Quality testing (DO, pH, Nitrate). Compare with NPS sondes (multiparameter data loggers) which measure four core parameters hourly from May through October of Indian River: water temperature, pH, specific conductance, and dissolved oxygen.

• Dinner on your own in town

**Sunday, August 9th**

• Morning: **Subsistence Living:** The indigenous Tlingit Native Americans will say, “When the tide is out, our table is set.” The wealth of tasty and nutritious plants and intertidal marine life which grow in the Sitka area has supported humans and wildlife alike for countless generations. A local edible plant expert and local Tlingit subsistence expert will lead students along the beach at low tide as they
collect and sample food. Students will learn about subsistence uses for plants and animals found in Sitka’s marine and terrestrial environments.

- **Afternoon: Invertebrates and the Intertidal:** Invertebrate specialist and University of Alaska faculty will introduce concepts in intertidal research using quadrats, transects and beach seining techniques. Students will conduct their fieldwork along the rocky intertidal at Starrigavan estuary. Students will be introduced to the history of marine ecology and the work of Ed Ricketts, Jack Calvin and Joseph Campbell.

- **Tide dependent: Magic Island Snorkeling and invertebrate sampling**
- **Dining Hall Dinner.** Provide instructors with 3 proposed research memo topics.

**Monday, August 10th**

- **Morning: Island Energy Issues:** How do we fuel our lives on an island in Southeast Alaska? Timber, fossil fuels, water, solar panels, wind turbines, heat pumps or a combination of all of these? What is best for the environment? For this excursion students will discuss island energy parameters and tour the hydroelectric plant and dam where a $150 million site expansion was just completed. This field trip will expose students to the ways in which a small community can lower its carbon footprint in surprisingly green ways and learn how to evaluate the costs and benefits of each energy-producing technology.

- **Afternoon: Assessing terrestrial and marine noise pollution with the National Park Service, including impacts to whales and other marine mammals, to land and seabirds, and to fish specifically from commercial offshore wind turbines. Discuss the pros and cons of a growing commercial cruise ship industry.**

- **Pizza and a movie: Sonic Sea**
- **Finalize and assign research memo topics for each student.**

**Tuesday, August 11th**

- **Morning: Conference Presentations**
- **Afternoon: Conference Presentations**
- **Dining Hall Dinner**

**Wednesday, August 12th**

- **Rock of Ages:** Located within an active plate margin, Sitka, Alaska, is perfectly situated for providing a unique and educational field experience in geology. In the shadow of a dormant volcano and adjacent to a Queen Charlotte-Fairweather transform fault that separates the Pacific Plate from the North American Plate, the tectonic setting of the Sitka region is complex and demonstrates the diversity of strike-slip convergence, an excellent natural laboratory for the study of exotic terranes. Students will hike Mount Edgecumbe, a spectacular shield volcano that is a rare representative of a leaky transform fault. Easily accessible by boat, the Edgecumbe volcanic lava field can be examined and sampled. Students will spend the night on the volcano (weather permitting)

- **Dining Hall Dinner**
Thursday, August 13th
- Morning/Afternoon: Return from Camping on Edgecumbe
- Late Afternoon: On your own
- Group dinner in town

Friday, August 14th
- Airport Departures
Suggested Equipment/Gear List for Summer 2020 Field Class

The following is a suggested list of items we recommend you pack in your luggage and/or purchase in Sitka. Weather permitting, we intend to hike the volcano and camp there overnight near the end of the trip. We will be in Sitka and there are opportunities to purchase items but just beware that costs are high in isolated areas.

- **Personal items** including foot powder, a basic first-aid kit with Moleskin, bandages, triple antibiotic ointment, an anti-inflammatory (e.g., Acetaminophen), strong insect repellent, sunscreen, lip balm, and hand moisturizer. Please avoid scented items and leave your perfume and cologne at home. You’ll also need to bring soap and shampoo as they are not provided.
- **Towel** and personal toiletry items.
- Warm **sleeping bag** (could be 30 degrees at night)
- **Tent** for overnight on volcano – we will try and coordinate sharing of tents to minimize packing and expense.
- **Flashlight** or headlamp with extra batteries for trips to the washroom.
- Battery operated **alarm clock**.
- Comfortable **waterproof day pack** (with plastic liner or cover) with at least 2 quart-sized water bottles, room for lunch, trail snacks, your small waterproof notebook and pencil/pen to take field notes, small pair of binoculars, digital camera/cell phone camera, and extra all-weather clothing (see suggested items below.
- Lightweight but supportive pair of **hiking boots** that are broken in before you get to Sitka.
- Comfortable **shoes** (sandals) for the evenings.
- Pair of **hiking poles** if you like using them (e.g., Leki collapsible).
- **Non-cotton clothes** that can be layered (e.g., wool, polar fleece, polyester, and any number of newer fabrics that keep you warm even when wet). **Minimum suggested items:** At least 2 pairs of wicking underwear, 2 pairs lightweight long underwear, 3 pairs of wicking socks (1 to keep in your daypack), 2 long-sleeve hiking shirts, 2 hiking t-shirts, 2 pairs hiking pants, 2 lightweight sweaters (or 1 sweater, 1 vest), and a belt. Layering of clothing may be necessary in the evening and due to changes in the weather out on the trail. By layering clothes while avoiding cotton will minimize chances of hypothermia.
- A **lightweight warm windbreaker/rain coat** with **hood**.
- A lightweight **wool hat**, 1 **rain hat/sun hat** with brim, and 1 pair lightweight but warm **wicking gloves**.
- **Sunglasses**.
- Digital **camera/cell phone** with camera.
- Small pair **binoculars**.
- Waterproof **matches**.
- Small but loud marine-type **whistle**.
- **Toilet paper** and plastic **bags** for packing out solids.
- Small laptop **computer/iPad/Smart phone** (suggest loading evening reading material on it), and pens and pencils.
Travel Notes:
Participants should make sure their health insurance and accident insurance covers them while traveling abroad. Additional coverage can be purchased through a variety of travel insurance options. To compare policies and for further information, visit a travel insurance comparison site such as Insure My Trip or Square Mouth.

In addition, Johns Hopkins is a member of International SOS, which covers JHU students and offers medical assistance and emergency assistance. It is a 24–hour Worldwide Assistance and Emergency Evaluation Service available for Johns Hopkins University students: International SOS is the world’s leading provider of medical assistance, international healthcare, security services, and outsourced customer care. Member #11BSGC000019. For more travel information please click here. Instructions for printing out your SOS card are provided there.

Students with Disabilities
Johns Hopkins University is committed to providing reasonable and appropriate accommodations to students with disabilities. Students with documented disabilities should contact the coordinator listed on the Disability Accommodations page. Further information and a link to the Student Request for Accommodation form can also be found on the Disability Accommodations page.

Ethics & Plagiarism
JHU Ethics Statement: The strength of the university depends on academic and personal integrity. In this course, you must be honest and truthful. Ethical violations include cheating on exams, plagiarism, reuse of assignments, improper use of the Internet and electronic devices, unauthorized collaboration, alteration of graded assignments, forgery and falsification, lying, facilitating academic dishonesty, and unfair competition. Read and adhere to JHU’s Notice on Plagiarism.

Dropping the Course
You are responsible for understanding the university’s policies and procedures regarding withdrawing from courses found in the current catalog. You should be aware of the current deadlines according to the Academic Calendar and specifically the ESP Course Website that discussed fiscal matters.

Code of Conduct
To better support all students, the Johns Hopkins University non-academic Student Conduct Code has been integrated and updated to include all divisions of the University. In addition, it is important to note that all AAP students are still accountable for the Code of Conduct for Advanced Academic Programs.

Title IX
Confidentiality and Mandatory Reporting
As an instructor, one of my responsibilities is to help create a safe and inclusive learning environment on our campus. I also have mandatory reporting responsibilities related to my role as a Responsible Employee under the Sexual Misconduct Policy & Procedures (which prohibits sexual harassment, sexual assault, relationship violence and stalking), as well as the General Anti-Harassment Policy (which prohibits all types of protected status based discrimination and harassment). It is my goal that you feel able to share information related to your life experiences in classroom discussions, in your written work, and in our one-on-one meetings. I will seek to keep information you share private to the greatest extent possible. However, I am required to share information that I learn of regarding sexual misconduct, as well as protected status based harassment and discrimination, with the Office of Institutional Equity (OIE). For a list of individuals/offices who can speak with you confidentially, please see Appendix B of the JHU Sexual Misconduct Policies and Laws.

For more information on both policies mentioned above, please see: JHU Relevant Policies, Codes, Statements and Principles. Please also note that certain faculty and other University community members also have a duty as a designated Campus Safety Authority under the Clery Act to notify campus security of certain crimes, as well as a duty under State law and University policy to report suspected child abuse and/or neglect.