HAIDA GWAII
HIGHER EDUCATION SOCIETY

Biophysical Dynamics of the Marine-Terrestrial Interface

HGSE 356

**** THIS IS A SAMPLE SYLLABUS, GUESTS, FIELD TRIPS AND OTHER COURSE DETAILS MAY VARY FROM YEAR TO YEAR. Contact HGHES for more details.**

Instructor:	Dr. Scott Wallace
Credits:	3

Course Description:

Land and sea have dynamic and profound influence on one another in Haida Gwaii, and students taking this course have a unique opportunity to explore such marine-terrestrial connections. Students learn about nutrient cycling between the marine environment and coastal terrestrial ecosystems, how the physical characteristics of this interface can affect these inputs, and which species play a pivotal role in driving interactions.

Topics include: basic hydrology, oceanographic dynamics of the coast, key habitats that bridge land and sea, biophysical characteristics of the shoreline and coastal terrestrial areas, and natural and anthropogenic impacts on coastal interface ecosystems.

Field sampling exercises during the fall salmon spawning season provide hands-on experience in different methods used to understand the dynamics of salmon bearing streams, estuaries, salt marshes, sand dunes, and a first-hand understanding of key factors driving land-sea interactions. Exemplary species demonstrate the application of course concepts, including indicators of ecosystem health, coastal habitat protection and restoration, impacts of fisheries on the health of coastal ecosystems and impacts of land management practices on coastal ecosystems.

Course Objectives:

- Nutrient cycling between marine and terrestrial ecosystems
- A basic understanding of stream ecology and nutrient spiraling
- Pacific salmon life history and habitat requirements
- Climate factors impacting marine-terrestrial interface
- Basic understanding of estuary, salt marsh, and sand dune ecology

Course Organization:

This course will be almost exclusively field based. Lectures will be delivered in the field followed by a field exercise designed to demonstrate the lecture material. During the course students will also be engaged in an independent field exercise that will run the

duration of the course.

Course Evaluation:

- **Final quiz (40%):** short/medium answers on anything covered in the course, including guest lecturers, field exercises, readings, videos, and field identification.

- **Paper: "My salmon ecosystem, my wrack" (60%)**

The Marine-Terrestrial interface often involves the transfer of organic material from the marine system to the terrestrial and vice versa. During the course the class will conduct a field study involving two different MTI's: (1) a local salmon ecosystem and (2) seaweed (wrack) that has washed ashore.

A. Salmon Ecosystem-in groups

The class will be divided into groups at beginning of the course. In these groups each person will do three field exercises designed to investigate various aspects and areas of your salmon ecosystem (forest, river and estuary).

This is not an experiment in that we are not testing a hypothesis. Instead, this is an observational study designed to better understand the dynamics at play in the transfer of nutrients and organic material across the marine-terrestrial ecotone.

B. Wrack Ecology-done individually

Starting on the first day of the course, students will set up beach wrack experiment sites that they will observe, maintain and monitor throughout the course. At the end of the three weeks, students will identify colonizing organisms, bringing samples in for viewing with the microscope

Write-up (50%): In about 4000 words, students will demonstrate their observations of both salmon and wrack ecosystems. This submission can be written as a scientific paper, journalistic, reflective, poetic, the choice is open and style is flexible. The student should draw upon field exercises from the entire course to supplement this paper.

Presentation (10%): Groups will also have to prepare a 10-12 minute presentation describing their salmon ecosystem.

In the lab: Using the microscopes students will identify and categorize all of the macroinvertebrates in their samples. **In their** final paper, students will integrate their findings into the description of your salmon ecosystem.

Course Readings & Schedule

Find readings corresponding to daily themes in Dropbox.

Week 1	(variable start time) 9-12	1-4
Monday	**Lectures**: Introductions, Intro to MTI & Physical vectors of the MTI	**Field Trip**: Tarundl Creek site visit
Tuesday	**Field Trip**: Watershed, 2 locations **Field Lecture**: Stream Ecology and the River Continuum Concept	**Lab/microscope ID session**
Wednesday	**Field Trip**: Rocky Intertidal zonation and exploration **Field Lecture**: Intertidal ecology	**Guest Lecture**
Thursday	**Field trip & lecture**: Estuary Ecology	**Field trip and guest lecture**: Midden archaeology
Friday	**Lecture**: Seminar	Independent Study
Week 2		
Monday	**Full day field trip & field lecture**: Sand dune ecology and sediment transfer to terrestrial environments; wrack ecology	
Tuesday	**Lecture**: Open Lecture	**Field trip**: Salmon hatchery tour
Wednesday	**Field trip**: Tarundl Creek site visit	**Guest lecture**

Thursday	**Full day field trip**: Masset salt marsh walk, bird ID, ecological processes **Guest Lecture**: Fisheries	
Friday	**Lecture**: Seminar	Independent Study
Week 3		
Monday	Thanksgiving Day – No Classes	
Tuesday	**Full day field trip**: Moresby Island watershed, Salmon biology, wildlife interactions, marine nutrients, human impacts, stream restoration	
Wednesday	**Field trip**: Tarundl Creek site visit	**In-class work time**
Thursday	**Final exam (30%)**	**Presentations (10%**)
Friday	**Lecture**: Seminar	Independent Study