Rivers and Beaches (ESS/Ocean 230)

Dave Montgomery
341 Johnson Hall / 685-2560
dave@ess.washington.edu

Chuck Nittrouer
111 Marine Sciences Building / 543-5099
nittroue@ocean.washington.edu

Andy Ritchie
323 Johnson Hall / 543-9419
aritchie@u.washington.edu

Marine Geology and Geophysics

Professor, School of Oceanography and
Dept of Earth & Space Sciences

Ph.D., University of Washington

Chuck Nittrouer's research interests include the modern and ancient formation of sedimentary strata in continental-margin environments, and the effects of physical and biological oceanic processes on sedimentary characteristics. Ongoing research includes coastal areas of New Guinea-Australia, the Mediterranean, and US west coast. Other recent studies have been completed at the mouth of the Amazon River, Asian rivers, and off Antarctic and Alaskan glaciers.

Geomorphology

Professor, Dept of Earth & Space Sciences

Ph.D., University of California, Berkeley

Dave Montgomery studies the evolution of topography and the influence of geomorphological processes on ecological systems and human societies. His work includes studies of the evolution and near-extirpation of salmon, fluvial and hillslope processes in mountain drainage basins, the evolution of mountain ranges (Cascades, Andes, and Himalayas), and the analysis of digital topography of Earth and Mars.

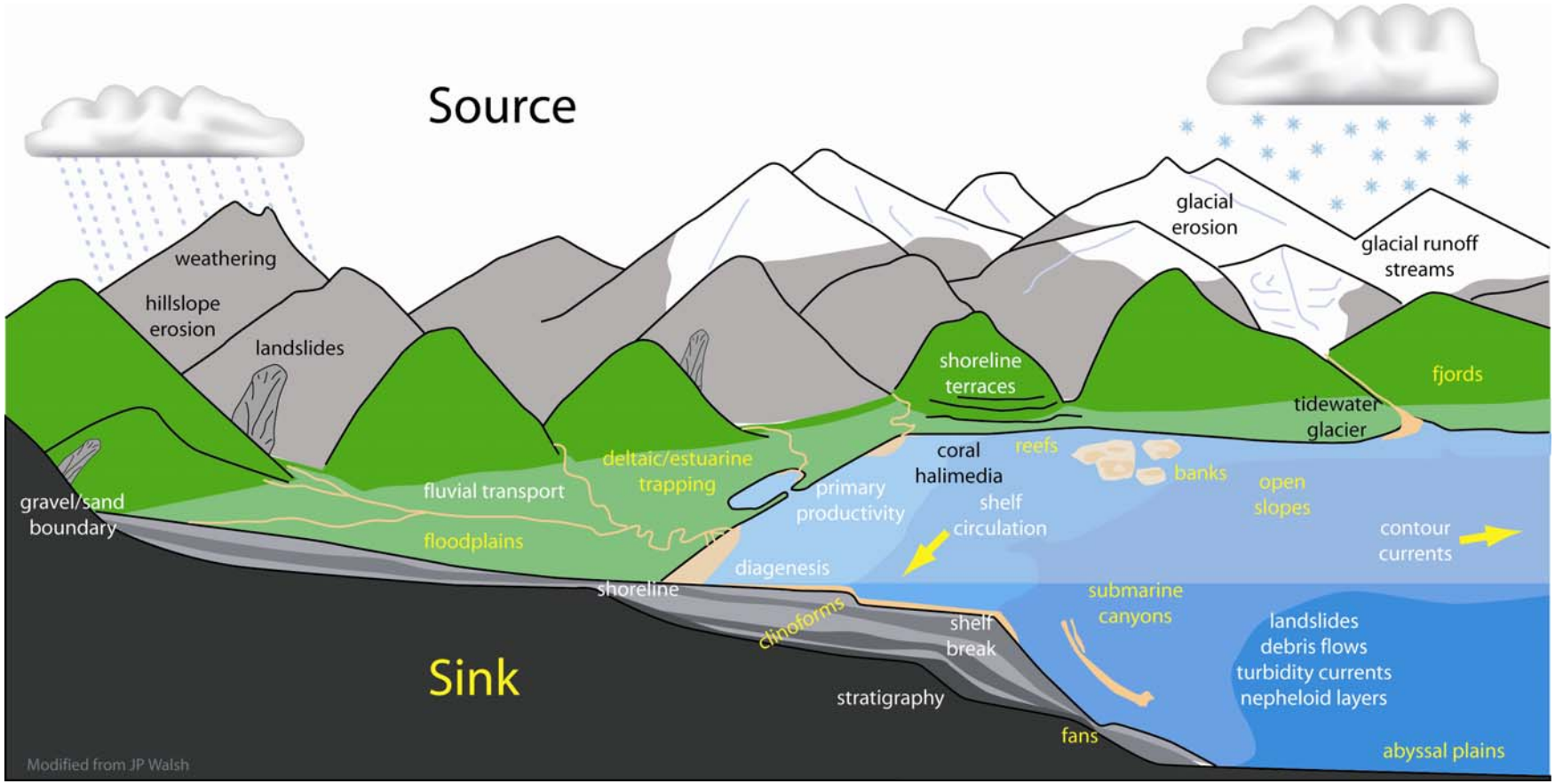
Topics to be covered

Mountains ⇒ Rivers ⇒ Beaches ⇒ Ocean

Earth Surface Processes

Holistic view, including: 1) Solid Earth
2) Atmosphere

Linkages between all these will be an emphasis of the course.


Source
weathering
hillslope erosion
landslides
glacial erosion
glacial runoff streams
shoreline terraces
fjords
tidewater glacier
deltaic/estuarine trapping
fluvial transport
floodplains
gravel/sand boundary
coral halimedia
reefs
banks
primary productivity
shelf circulation
open slopes
contour currents
diagenesis
shoreline
chronoforms
shelf break
submarine canyons
landslides
debris flows
turbidity currents
nepheloid layers
Sink
stratigraphy
fans
abyssal plains
Modified from JP Walsh

Earth Surface = where we live

Recent Dramatic examples:

Indonesia
earthquake $\Rightarrow$ landslide $\Rightarrow$ tsunami

New Orleans
hurricane $\Rightarrow$ wind $\Rightarrow$storm surge

emphasis on understanding fundamental processes, but shock and awe will come with some examples

Time and Place

Lectures:	M,W & F	1:30 - 2:20	14 Ocean Teaching Bldg
Labs (5 credit):	W	2:30 - 3:20	205 Ocean Teaching Bldg

Lab Fee: $50

3 or 5 credits (Natural World)

Website:
http://gis.ess.washington.edu/grg/courses07_08/ess230/

Exams and Grading

31 Oct (W)	Mid-Term Exam, during class
10 Dec (M)	Final Exam 2:30 – 4:20 (PM)

Grading:

	3 credits	5 credits
midterm =	40%	35%
field trip/labs =	20%	30%
final =	40%	35%

No make-up field trips, No extra credit

Field Trips

A1	6 Oct (Sat)	Nisqually River watershed
A2	13 Oct (Sat)	Nisqually River watershed
B	24 Oct (Wed)	Puget Sound cruise
C	17-18 Nov (Sat & Sun)	Olympic Peninsula Beaches

For 3 credits; fieldtrip A is required. You are welcome to participate in additional field trips, if space is available.

For 5 credits; all field trips required.

Email Andy to reserve your space on trip A

aritchie@u.washington.edu

Labs/Field Trip Write Ups

A field trip write up is due after each field trip, as indicated on the course syllabus.

Field Trip A

Trip from Mt. Rainier downstream to Nisqually River delta

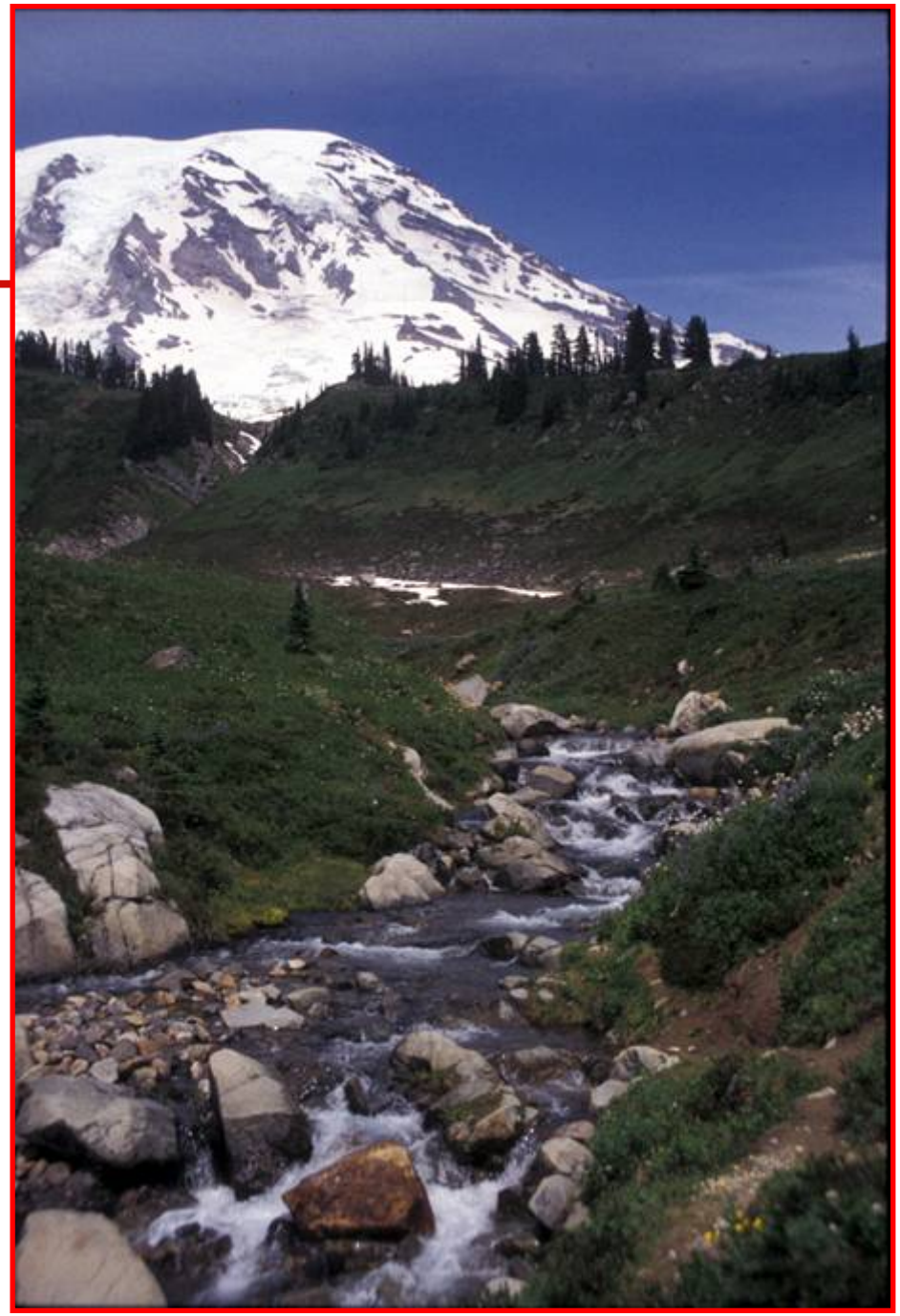
Either

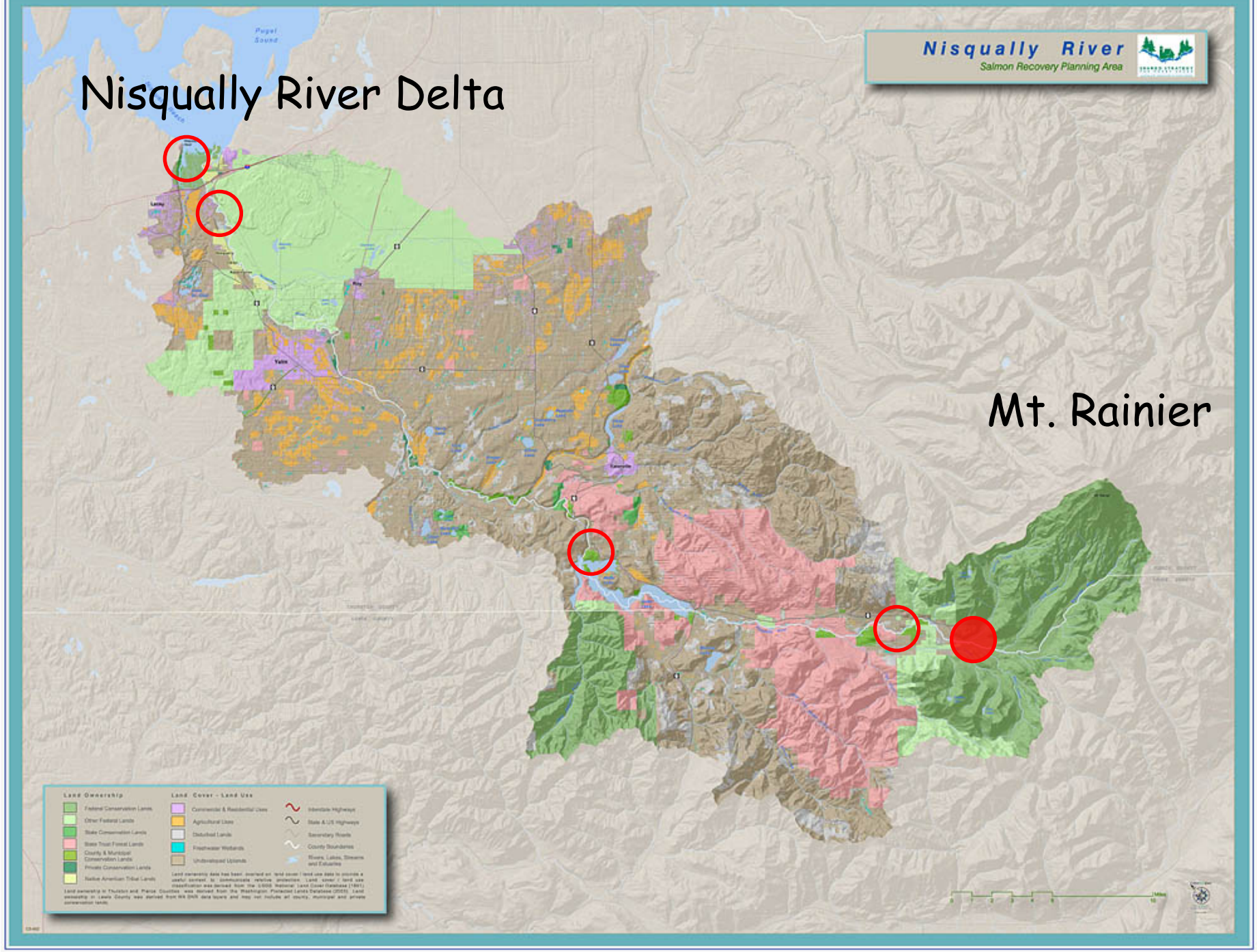
Saturday October 6

or

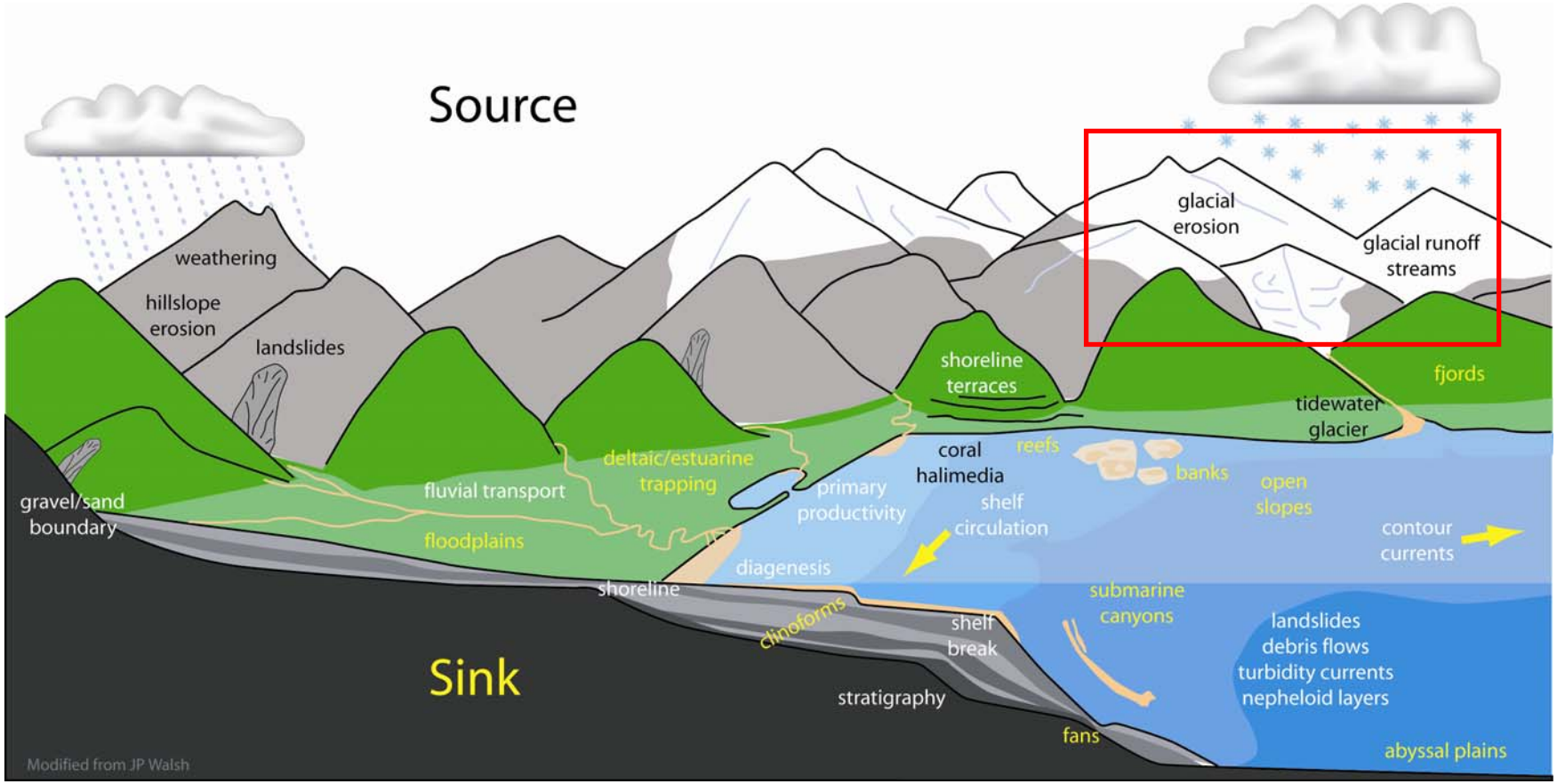
Saturday October 13

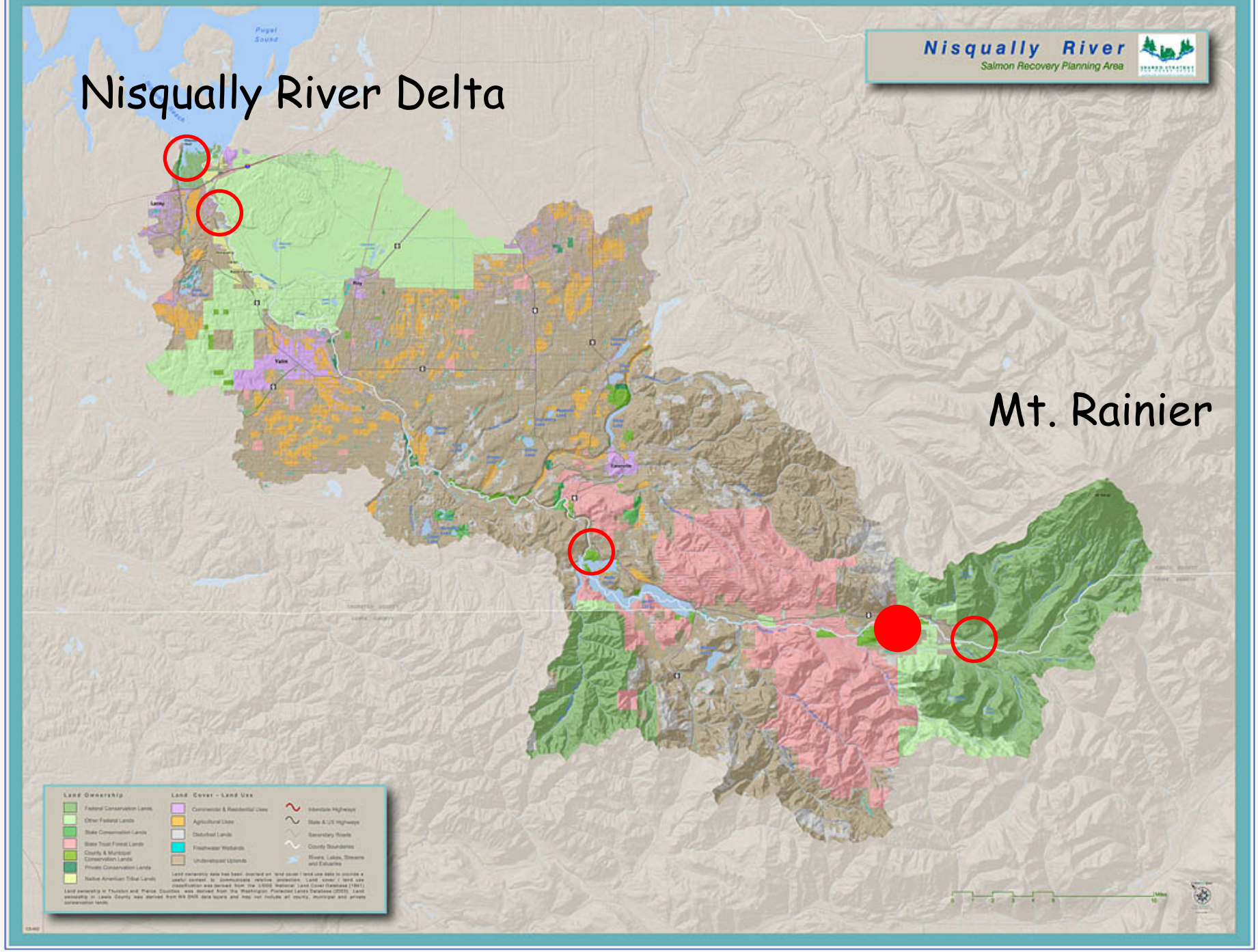
All day




Nisqually River
Salmon Recovery Planning Area
Nisqually River Delta
Mt. Rainier
Land Ownership
Land Cover - Land Use

Start at glaciated flank of Mt. Rainier

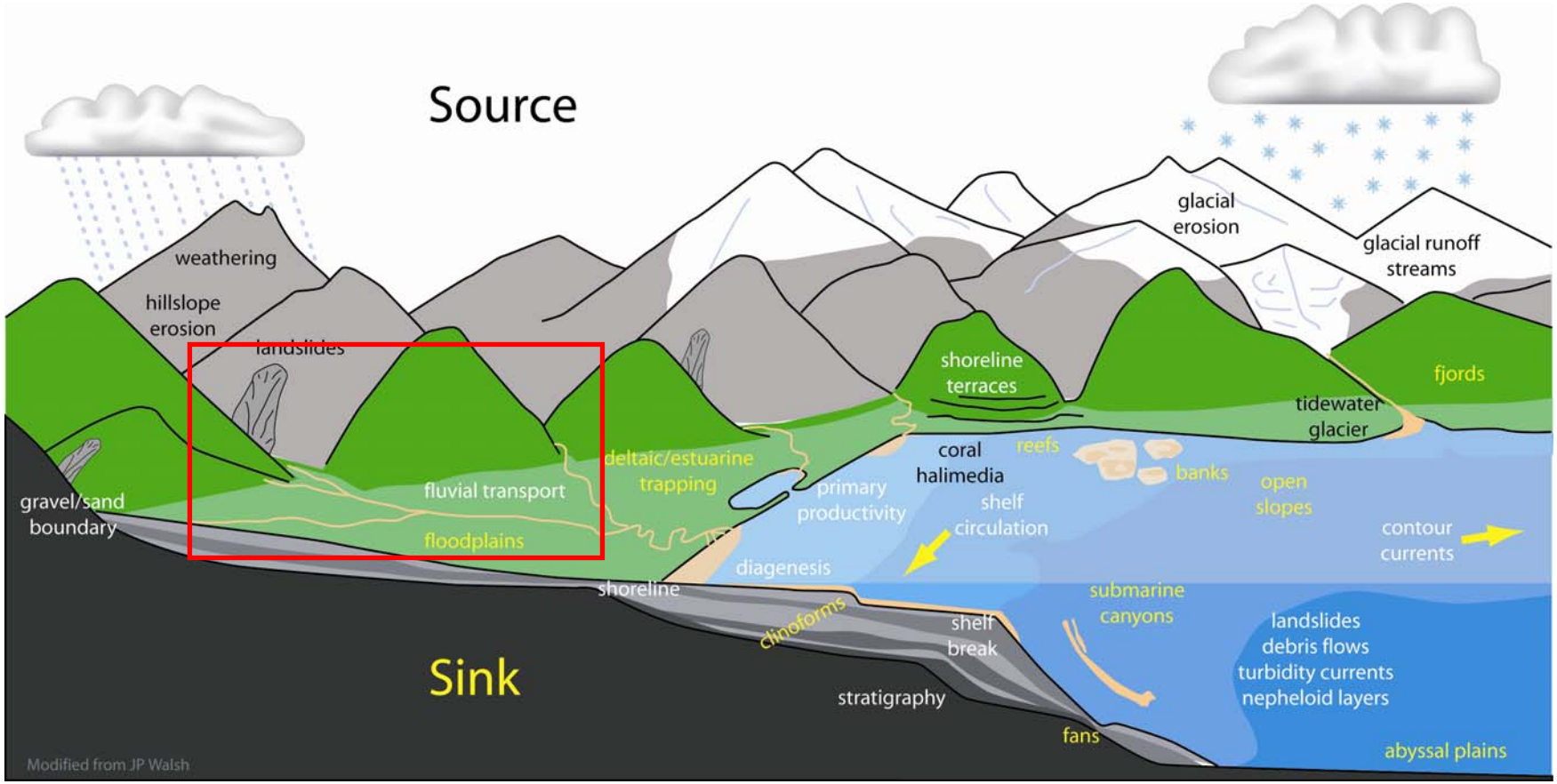



Nisqually River Delta
Nisqually River
Salmon Recovery Planning Area
Mt. Rainier

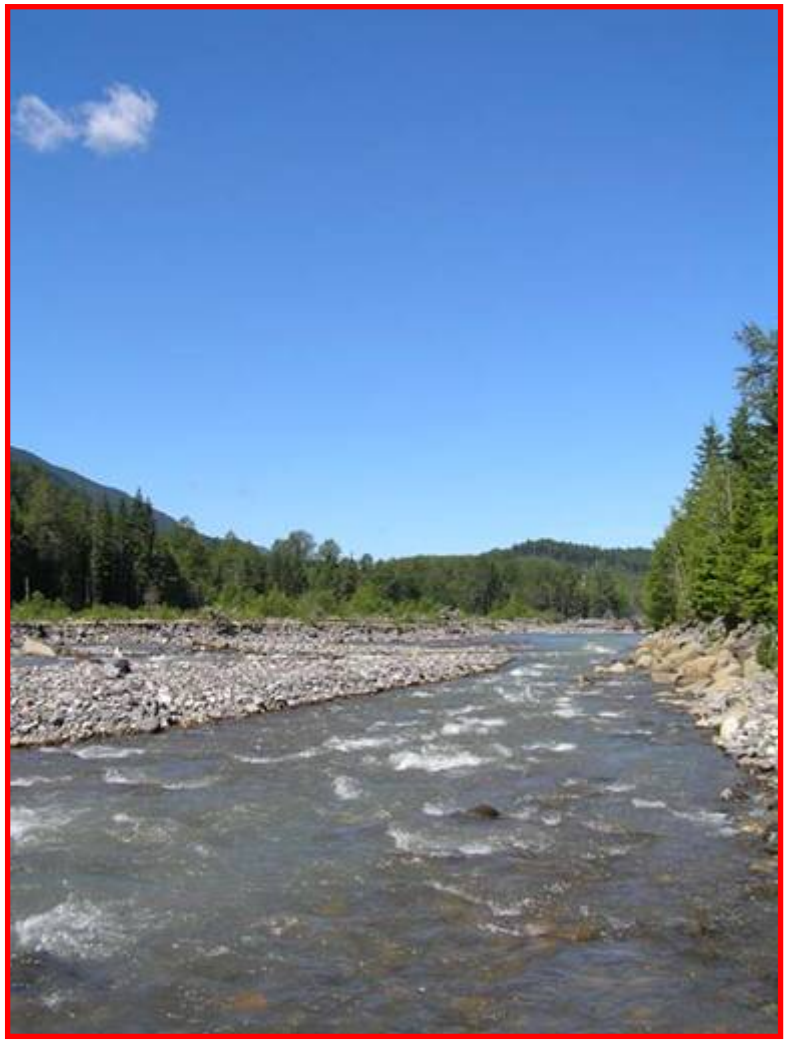
Field Trip A

Field Trip A

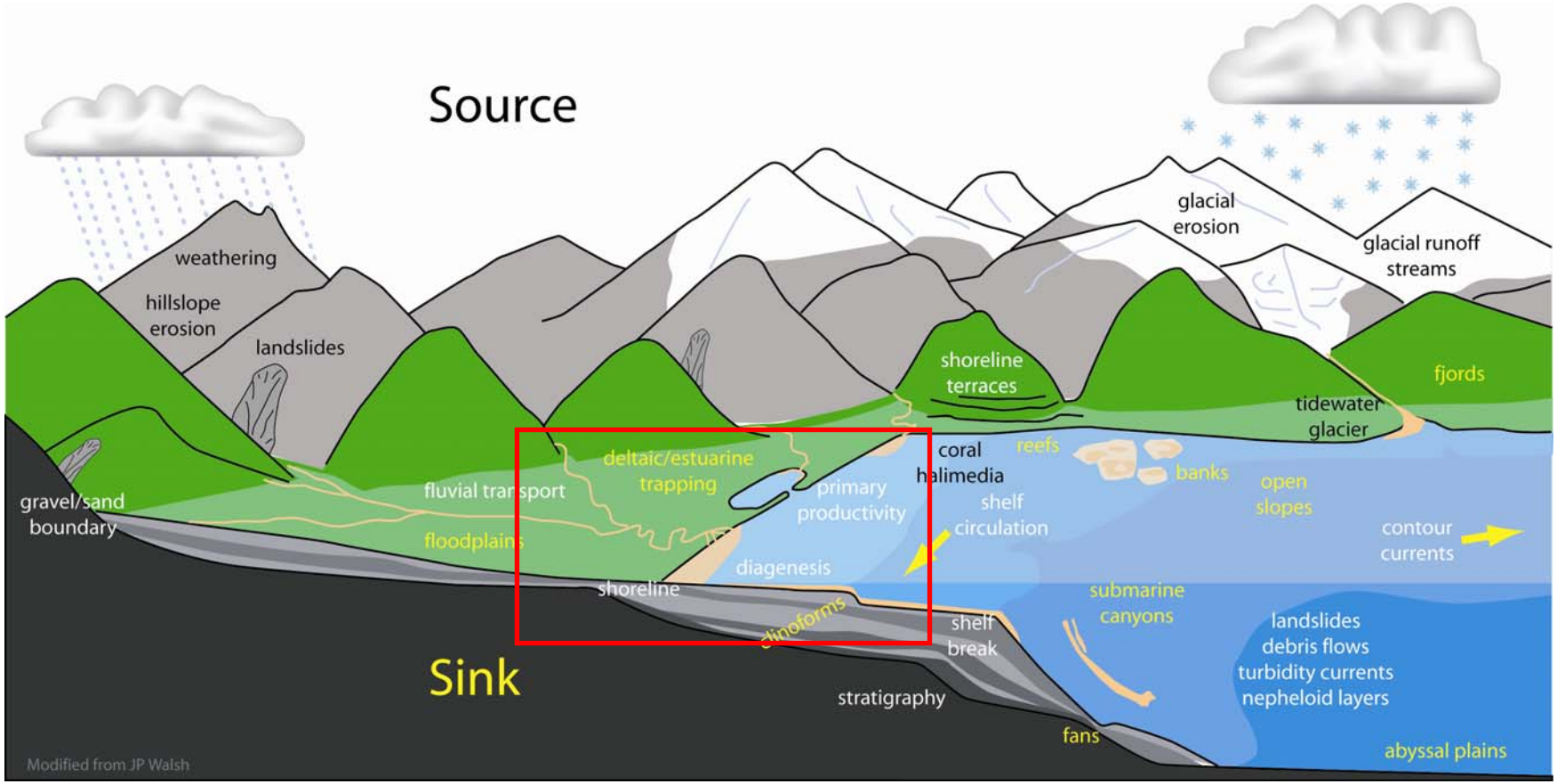
Follow river system down through mountain streams and into large rivers



Field Trip A



End at delta system where Nisqually River empties into Puget Sound



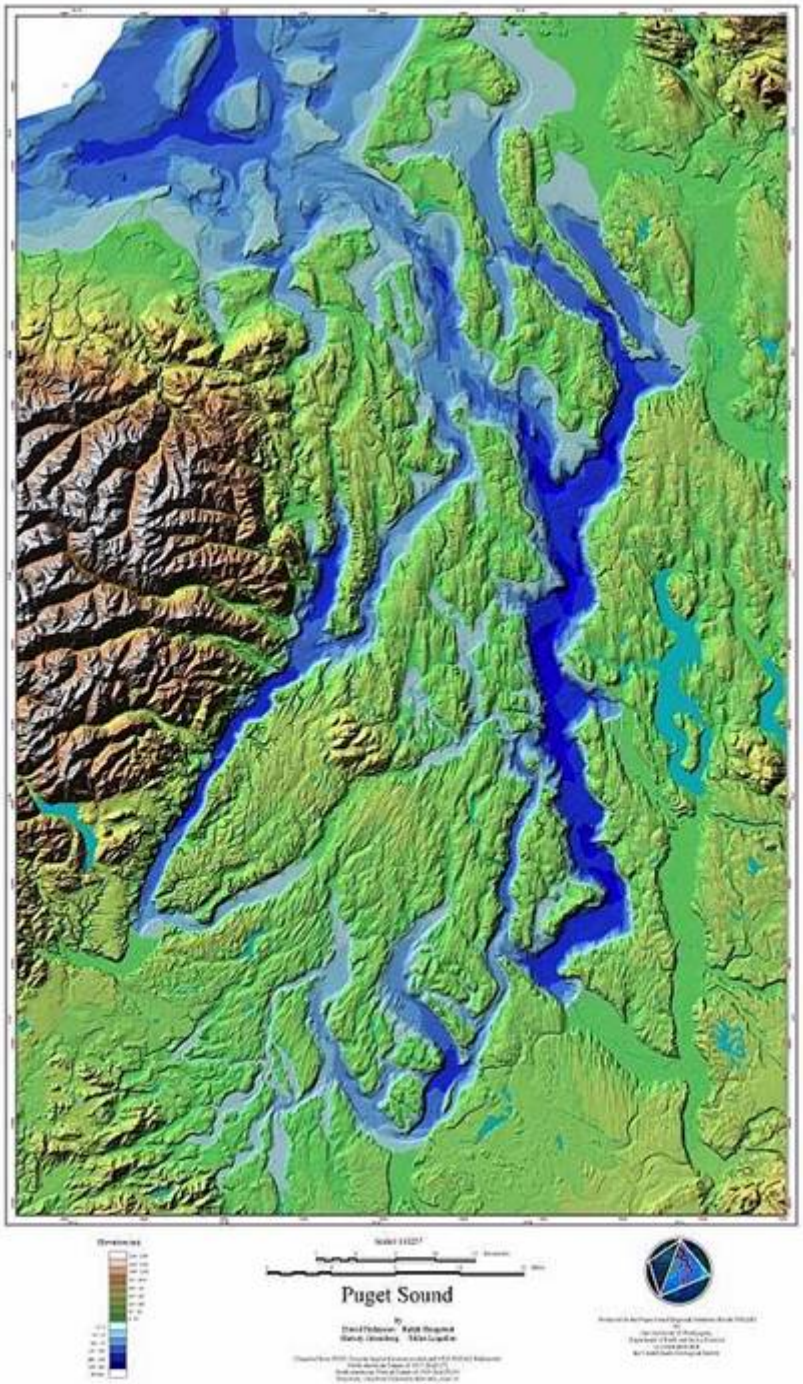
Field Trip A

Field Trip B

Working cruise on Puget Sound with Research Vessel Thompson, UW's oceanographic research vessel

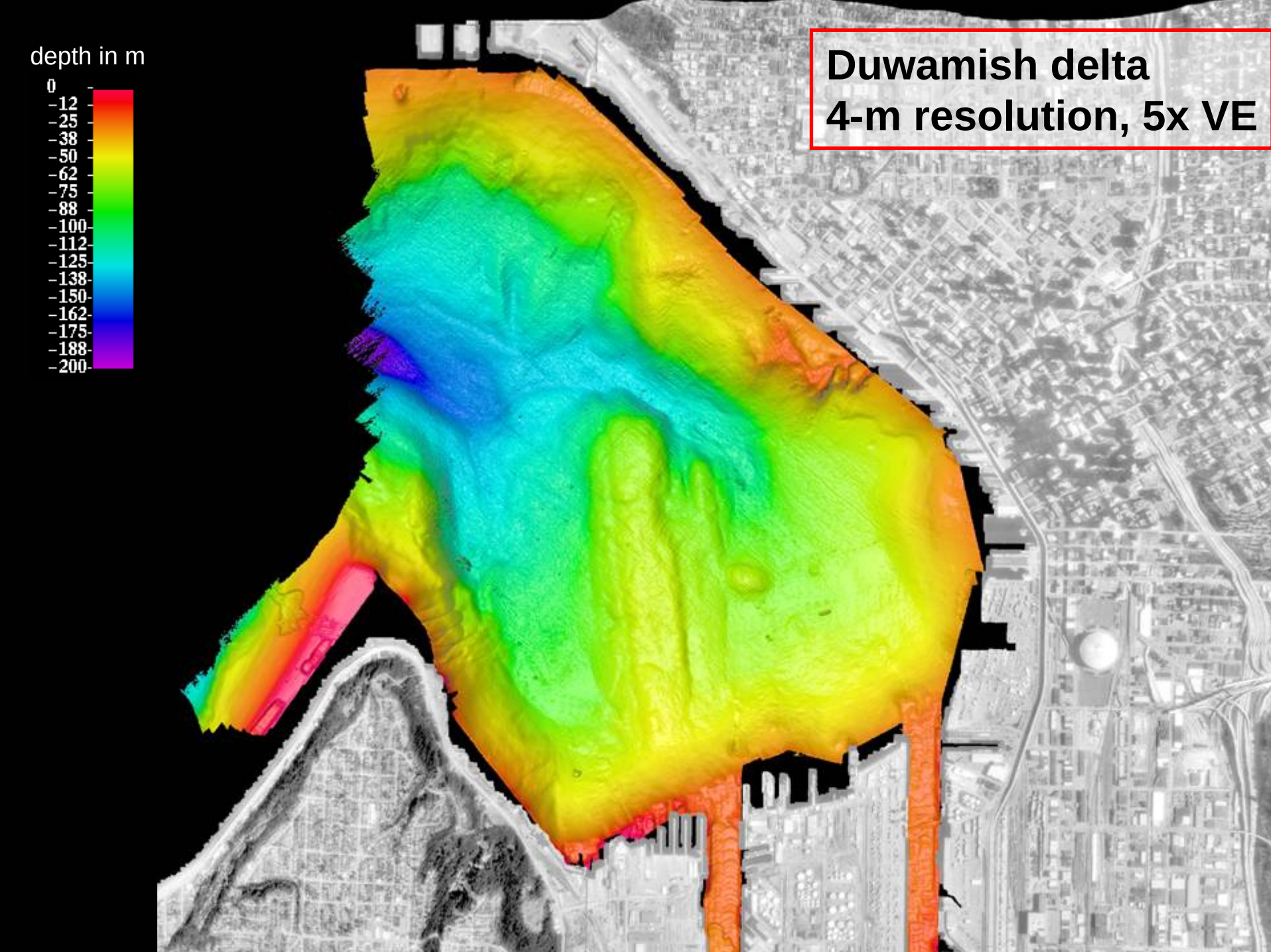
Wednesday
24 October

All day
(no class or lab)



Cruise on Puget Sound from Elliot Bay to Nisqually River Delta

Sample bottom sediments, measure water salinity and temperature, and map bathymetry


depth in m
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-62
-75
-88
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-125
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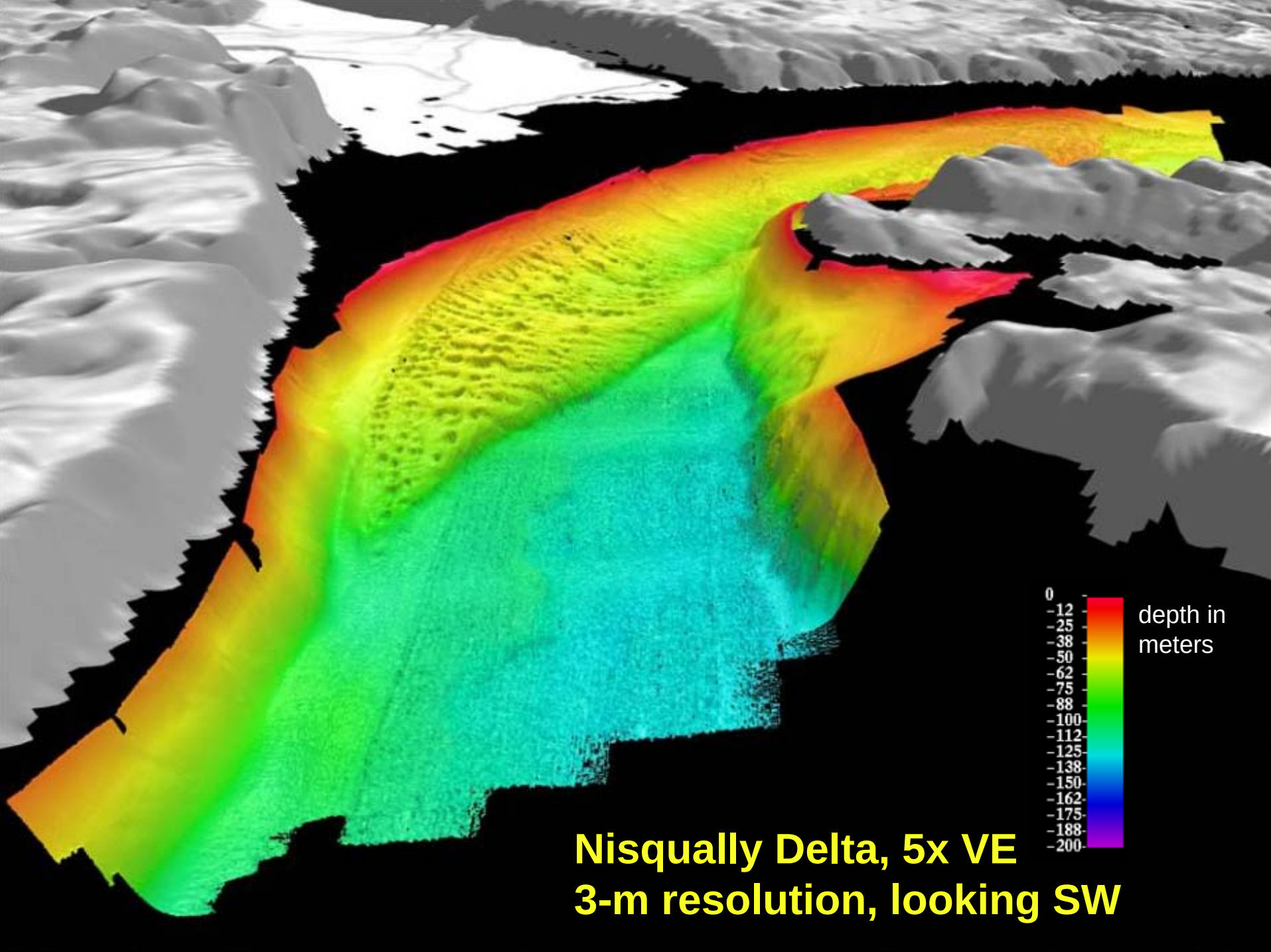
-162
-175
-188
-200
Duwamish delta
4-m resolution, 5x VE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-125
-138
-150
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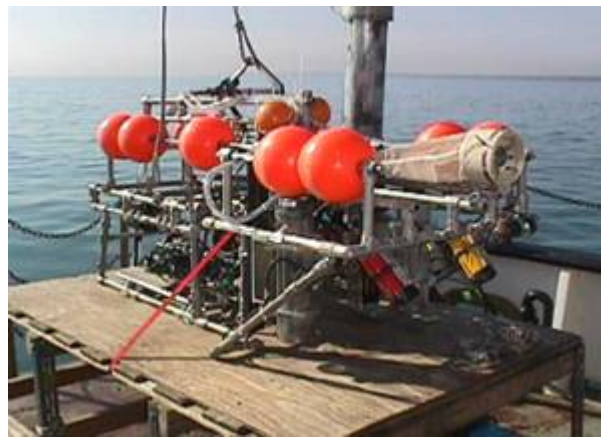
-175
-188
-200
depth in meters
Nisqually Delta, 5x VE
3-m resolution, looking SW



Field Trip C

Beaches of the Olympic Peninsula

18-19 November

Saturday and Sunday; Overnight camping in the field.


Strait of Juan de Fuca
Pacific Ocean
Neah Bay
Seiku
Clallam Bay
Lake Ozette
Port Angeles
Sequim
Port Townsend
Elwha
Sol Duc Hot Springs
Hurricane Ridge
Rialto Beach
La Push
Forks
Port Hadlock
Port Ludlow
Everett
Kingston
Edmonds
Hoh Rain Forest
OLYMPIC
NATIONAL
PARK
Quilcene
Brinnon
Poulsbo
Winslow
Seattle
Kalaloch
Queets
Lake Quinault
Lake Cushman
Hoodsport
Neilton
Shelton
Moclips
Pacific Beach
Copalis Beach
Ocean City
Ocean Shores
Kamiche
Tacoma
McCleary
Hoquiam
Aberdeen
Elma
Olympia
Westport
Grayland
101
112
113
104
3
108
109
12
9
105
5

Field Trip Tips

Bring clothes for bad weather (rain, cold, wind) -- even if it doesn't seem like you'll need them!

Get UW supplemental field trip insurance: it's only $0.85 per day!

(*www.washington.edu/admin/risk/documents/Domestic_Trip_Coverage.pdf*)

Field Trip Commitments

You must email Andy by this Friday with your preferred date for field trip A.

aritchie@u.washington.edu

Space will be filled on a first-come basis

If you are 3-credit and would like to go on more than one trip -- clearly indicate this.

Constraints:

limited space for 3-credit people on Thompson cruise (field trip B).

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