



Welcome to 2021 Ocean Optics Class

SMS 598: Calibration and Validation for Ocean Color Remote Sensing, July 19th– Aug. 13th 2021

Instructors: Emmanuel Boss – UMaine - coordinator
Collin Roesler – Bowdoin College
Curt Mobley – Sequoia Scientific, Emeritus
Ken Voss – U. Miami
Meg Estapa – UMaine
Ivona Cetinic – NASA Goddard
Jeremy Werdell – NASA Goddard

TA: Guillaume Bourdin– UMaine

+Help from: Jim Loftin, UMaine
Susan Drapeau, Bowdoin College

Class website: <http://misclab.umeoce.maine.edu/OceanOpticsClass2021/>



Welcome to Maine



Maine facts:

Population (2019): 1.34 million

Coastline: 5300 miles

Area: ~35 k mile² (4.5k mile² inland waters)

Seasons: Tourist, Foliage, Ski, & Mud
(some further subdivide it according to wild
foods or prevailing **pests**).

History of the Ocean Optics class

1985, 1987, 1989, 1995, 1998, 2001, 2004, 2007, 2011, 2013, 2015, 2017, 2019 and now 2021. This is 14th class and the 36th anniversary!!!

Mary Jane Perry and Ken Carder started it in 1985 at Friday Harbor Lab

Collin was student in 1987, TAed in 1989, joined as instructor in 1995.

Emmanuel was student 1995, Taed in 1998, joined as instructor in 2001.

Curt joined as instructor in 1995.

Ken joined as an instructor in 2011.

Jeremy joined as an instructor in 2011.

Ivona was a student in 2007, helped in 2013, joined as instructor in 2015

Meg was a student in 2007, Taed in 2011, joined as instructor in 2021!

Over 230 graduates, who have gone on to work at NASA and other federal and state agencies, direct major oceanographic organization, run major research programs, academics/researchers, or other creative outlets.

History of the Ocean Optics class

Evolution and highlights:

1985: 1 spectrophotometer, 1 PAR sensor, a homemade spectral transmissometer, Turner fluorometer.

1987: 1 computer, borrowed Flow Cytometer

1989: Optics Symposium + resultant book (*Ocean Optics*)

1995: Hydrolight on a borrowed UNIX workstation

1998: hyper-spectral over-flights; special Ocean Sciences session

2001: moved to Maine

2007: Ocean Optics Web book (<http://www.oceanopticsbook.info/>).

2015: 30th anniversary and Mary Jane Perry's last year

2021: first year at Bowdoin Schiller Coastal Studies Center...???

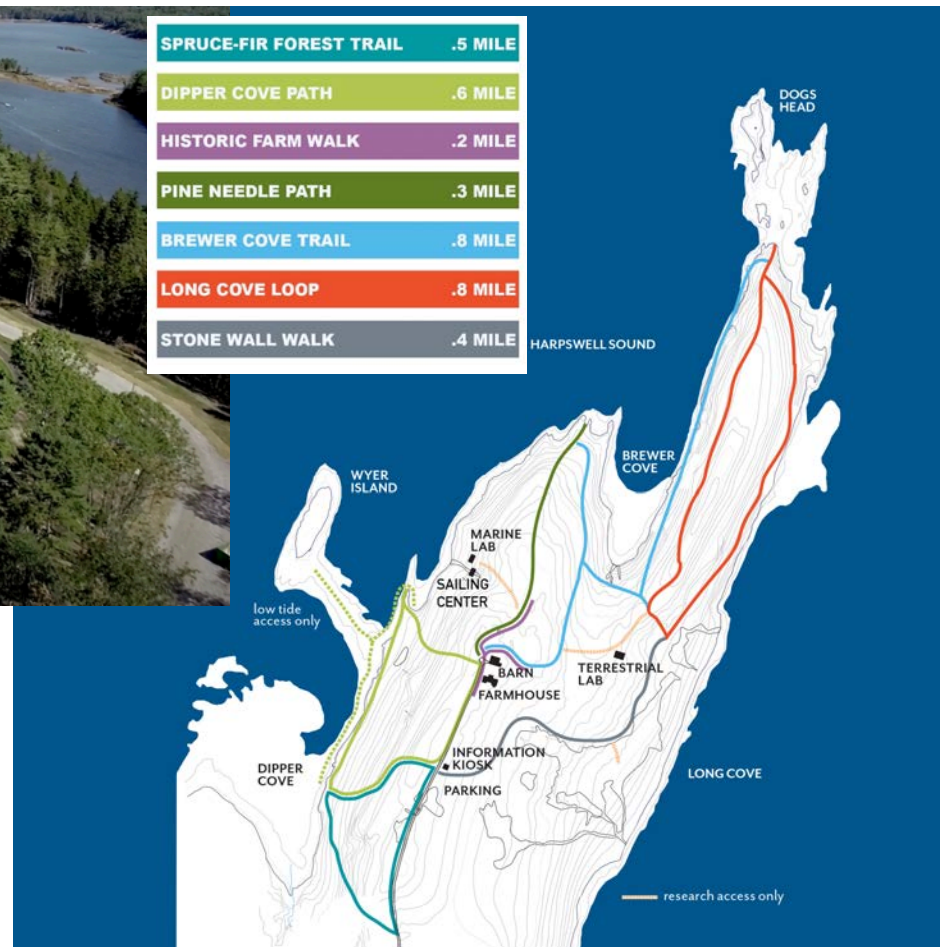
Welcome to Bowdoin College's Schiller Coastal Studies Center

- 118 acres, 2.5 miles of shoreline
- 1981 gift of the Thalheimer Family
- 1995 built the terrestrial and flowing seawater labs (LL Bean family)
- 2006 research pier and floating dock (Wrigley Rusack family)
- 2017 SCSC teaching lab, LLC, dorms and apt (Schiller family)

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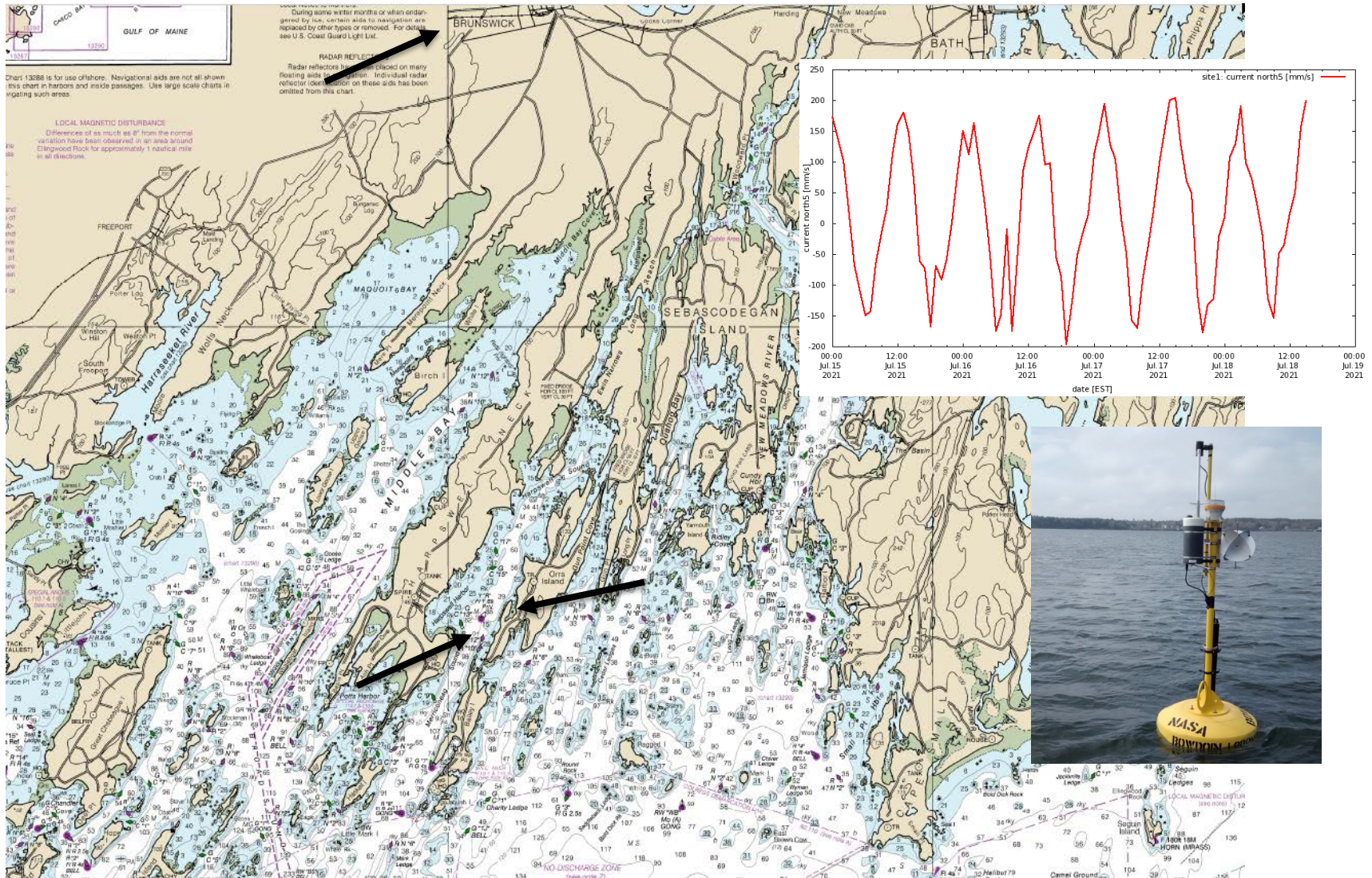


SPRUCE-FIR FOREST TRAIL	.5 MILE
DIPPER COVE PATH	.6 MILE
HISTORIC FARM WALK	.2 MILE
PINE NEEDLE PATH	.3 MILE
BREWER COVE TRAIL	.8 MILE
LONG COVE LOOP	.8 MILE
STONE WALL WALK	.4 MILE



- Walking trails
- Buildings

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Hydrographic and Tide information

- LOBO <http://bowdoin.loboviz.com/>
- <https://www.usharbors.com/harbor/maine/south-harpswell-me/tides/>

US HARBORS

www.USHarbors.com

South Harpswell, ME - Jul 2021

Date	High				Low				☀		☾	
	AM	ft	PM	ft	AM	ft	PM	ft	Rise	Set	Moon	
19	Mon	7:00	8.9	7:25	10.2	12:48	0.2	1:02	0.4	5:15	8:18	☾
20	Tue	8:07	8.8	8:26	10.4	1:52	-0.1	2:03	0.4	5:16	8:18	☾
21	Wed	9:11	8.9	9:26	10.7	2:56	-0.4	3:05	0.4	5:17	8:17	☾
22	Thu	10:12	9.1	10:23	10.9	3:57	-0.7	4:03	0.3	5:18	8:16	☾
23	Fri	11:09	9.3	11:19	11.0	4:53	-1.0	5:00	0.1	5:19	8:15	☾
24	Sat			12:04	9.4	5:48	-1.1	5:55	0.1	5:20	8:14	☾
25	Sun	12:14	11.0	12:56	9.5	6:40	-1.1	6:48	0.1	5:21	8:13	☾
26	Mon	1:05	10.8	1:46	9.5	7:29	-0.9	7:39	0.2	5:22	8:12	☾
27	Tue	1:55	10.5	2:34	9.4	8:16	-0.6	8:30	0.4	5:23	8:11	☾
28	Wed	2:44	10.0	3:22	9.3	9:03	-0.2	9:22	0.7	5:24	8:10	☾
29	Thu	3:35	9.5	4:10	9.1	9:49	0.2	10:15	0.9	5:25	8:09	☾
30	Fri	4:27	8.9	4:58	9.0	10:36	0.7	11:09	1.2	5:26	8:07	☾
31	Sat	5:20	8.4	5:47	8.8	11:24	1.2			5:28	8:06	☾



Another way to qualitatively monitor
Harpswell sound (or your favorite
coastal area)

Sentinel playground

Daily Schedule

Tuesday: welcome from Steve
Allen Associate Director of SCSC

- 7:30 – 8:00 Breakfast
- 8:00 – 8:15 Clean up and organize tables
- 8:30 – 10:00 Lecture 1
- 10:00 – 10:15 break
- 10:15 – 11:45 Lecture 2
- 12:00 – 1:00 Lunch and clean up
- 1:00 – 5:00 Lab (+ 3:00pm coffee break)
- 5:30 – 6:00 Dinner followed by clean up

Mondays 11:30ish COVID testing

Key to the Class's Success –

Expectation is for team work, each with his/her/their own focus. Collaborative environment. Learning community. Networking. Contribute to advancement of ocean sciences through ocean optics.

First two weeks: *animated* lectures in morning; related lab in afternoon covering basic concept → use of instruments, calibration, data processing. Strong emphasis on relating optical signal to biogeochemical properties, critical thinking, calibration, critical analysis of data, hands-on experience. **Closure**.

Cruise experience: collecting complete data set in the field and processing it; learning how to submit documented data to SeaBASS (required of all NASA projects).

Key to your (and our) Success –

You are part of a like-minded community.

Sharing/helping others will benefit you in the long term.

You are not in competition with others. Each of you have strengths and weaknesses; share your strengths allow others to help you work to strengthen your weaknesses. You are much stronger if you have others caring about you and helping you. Science is not pie; there is more than enough work to go around.

The better our field is in providing useful science & data products to study the ocean with, the better we all are in terms of getting new missions funded and new funds for science. Be honest about what we can and cannot achieve, and work hard to improve it.

Course schedule and syllabus

Daily student reporting and summary of previous day's lab

Weekends are yours

T-Shirts

SeaDAS – <https://seadas.gsfc.nasa.gov>

week 3 includes a SeaDAS lab

ASSIGNMENT for weeks 1 and 2:

you are expected to have access to (install) a **fully working version of SeaDAS before this lab, including installation of the OCSSW processing capability** for MODIS-Aqua and Landsat 8; this can be on your own laptop, or working with 1 other person

troubleshooting:

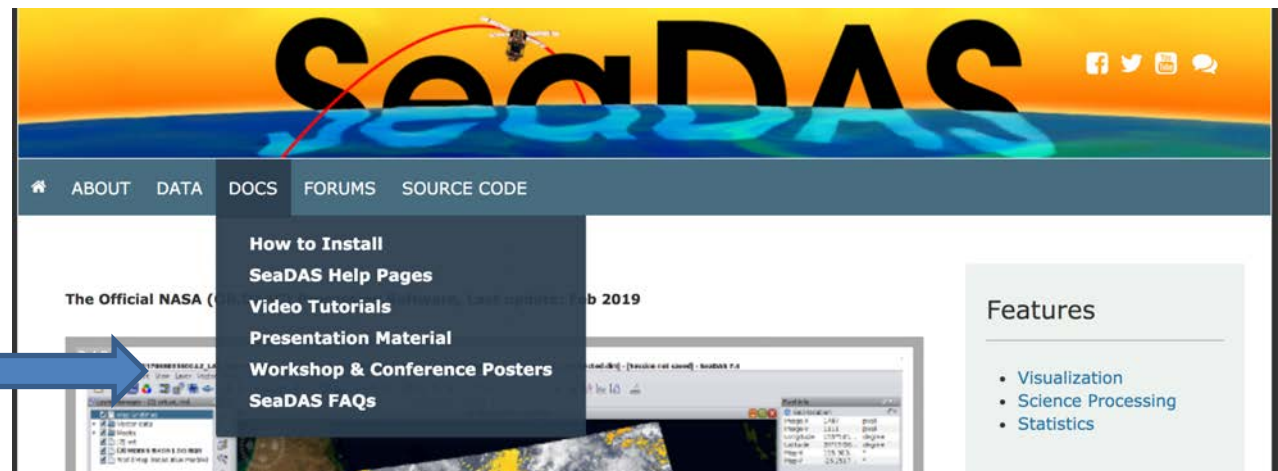
proceed as if you are working in your home institution – visit the OceanColor forum, get your colleagues to help, break things until they work

resources:

help pages

video tutorials

presentations



INTRODUCTIONS – work with a fellow student or staff member over lunch; introduce the student/staff to the class after lunch.

NAME of person you are introducing:

WHERE they come from (state/country and school or institution):

THE PAST – something about the person’s background that resulted in them being in this course:

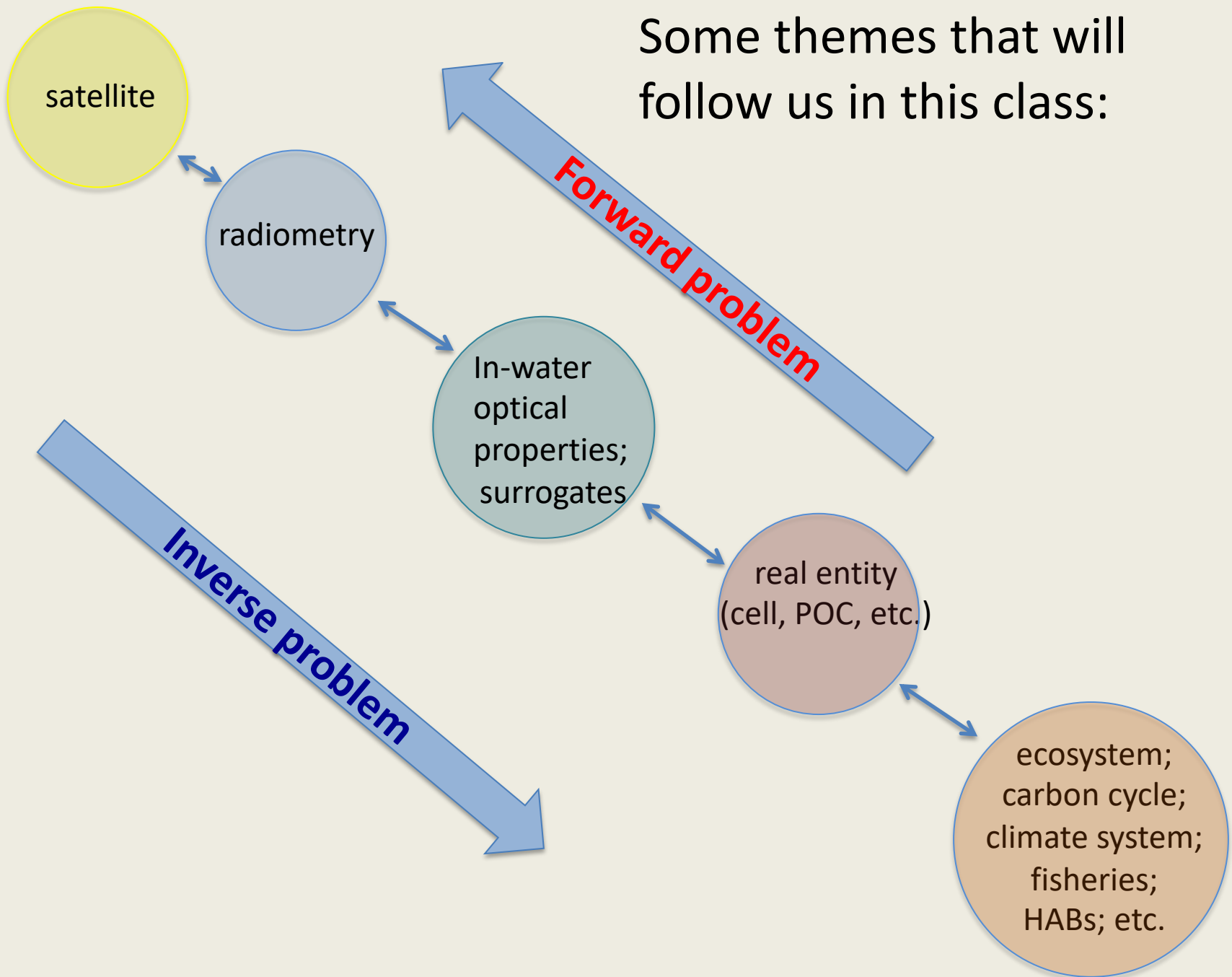
THE FUTURE – something that they hope this course will help them achieve in their future plans

THE PRESENT – something that they want to get of this course and how everyone else can contribute to this experience (it might be asking for help in something challenging):

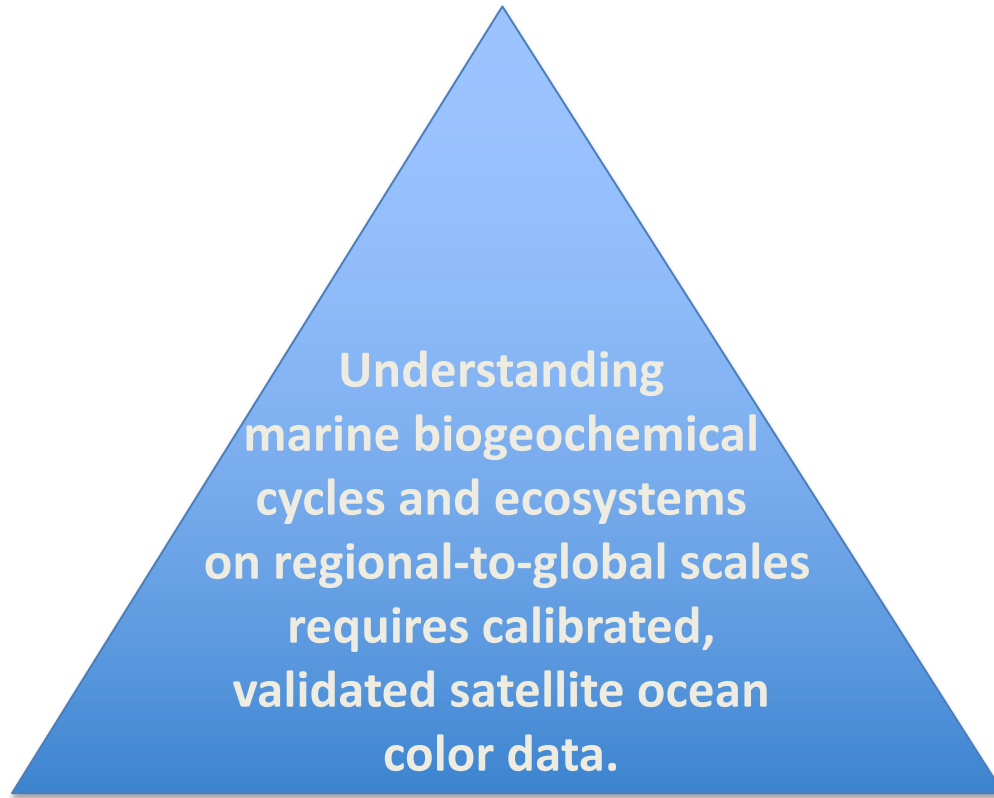
THE UNEXPECTED – something that we would never guess about the person’s activities, skills, or interests:

PARALLEL UNIVERSE – If I was not me I would like to be a:

Some themes that will follow us in this class:



Sampling strategy must include appropriate spatial/temporal scales.



Successful satellite cal/val depends on high quality, in-water measurements.

Use measurement – measurement closure and measurement – model closure to reduce uncertainty.