



CCG



Aquatic primary production: An assessment of current methodological approaches towards building community consensus

December 05 – December 07, 2018

Meeting location: BOARD ROOM - University Space Research Association (USRA) Headquarters in Columbia, Maryland.

Agenda Items

Wednesday, December 5th (all times are U.S. Eastern Standard Time)

Time	Item	Presenter
9:00	Welcome/Introduction Workshop objectives	Ryan Vandermeulen NASA GSFC
9:10	NASA Protocol Activities, PACE mission	Antonio Mannino NASA GSFC

*Morning session: Measurements of Primary Production
(10-12 min. presentations, followed by questions/discussion)*

9:20	Primary Productivity, A Historical Perspective	John Marra City University of New York
9:40	¹⁴C incubations: Advantages, Disadvantages, Assumptions	Kim Halsey Oregon State University
10:00	Stable isotope (¹³C/¹⁸O) Incubations/Methodology	Ricardo Letelier Oregon State University
10:20	Coffee Break	
10:40	Dissolved oxygen rate measurements of NCP	Joe Salisbury University of New Hampshire

11:00	Oxygen/Argon ratios to quantify NCP	Laurie Juranek Oregon State University
11:20	Triple Oxygen Isotope methodology to measure GOP	Rachel Stanley Wellesley College
11:40	Photo-physiology/FRRF methodology	Maxim Gorbunov Rutgers University
12:00	Lunch Break	

*Afternoon session: Scaling of Primary Production
(10-12 min. presentations, followed by questions/discussion)*

13:30	Scaling up: Autonomous in situ budgets of Productivity	Roo Nicholson Woods Hole Oceanographic Institute
13:50	Scaling up: Satellite-based budgets of Productivity	Barney Balch Bigelow Laboratory for Ocean Sciences
14:10	Scaling up: Modeling efforts for Primary Productivity	Greg Silsbe University of Maryland – Horn Point
14:30	Coffee Break	
14:50	Discussion 1*: (See Discussion Topics)	Moderator: Gemma Kulk Plymouth Marine Laboratory
15:55	Discussion 2* (See Discussion Topics)	Moderator: Mary Jane Perry University of Maine
17:00	Adjourn	

Thursday, December 6th

Time	Item	Presenter
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*Morning session: Uncertainties, standardization, and desired products
(moderated discussion, presentations as needed)*

9:00	Summary of Wednesday + Discussion Objectives	Joaquin Chaves NASA GSFC
9:10	Discussion 3* (See Discussion Topics)	Moderator: Solange Duhamel Columbia/LDEO

10:10	Coffee Break	
10:30	Discussion 4* (See Discussion Topics)	Moderator: Tomonori Isada Hokkaido University
11:30	Lunch Break	
<i>Afternoon session: Uncertainties, standardization, and desired products (moderated discussion, presentations as needed)</i>		
13:00	Discussion 5* (See Discussion Topics)	Moderator: Joaquim Goes Columbia/LDEO
14:00	Discussion 6* (See Discussion Topics)	Moderator: Ana Fernandez Carrera Universidade de Vigo
15:00	Coffee Break	
15:20	Discussion 7* (See Discussion Topics)	Moderator: Ryan Vandermeulen NASA GSFC
16:20	Outstanding Discussion	Moderator(s): TBD
17:00	Adjourn	

Friday, December 7th

Time	Item	Presenter
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*Morning session: Open Discussion and Wrap-up
(presentations as needed)*

9:00	Summary of Thursday + Wrap-up Objectives	Ryan Vandermeulen NASA GSFC
9:10	Wrap up discussion: (Conclusions, deliverables)	Ryan Vandermeulen/Joaquin Chaves NASA GSFC
10:20	Coffee break	
10:40	Wrap up discussion: (Protocol Outline, writing assignments)	Ryan Vandermeulen/Joaquin Chaves NASA GSFC
11:45	Next steps/Conclusion	
12:00	Meeting adjourn	

MODERATED DISCUSSION TOPICS

**Discussion topics are subject to modification as ideas develop in the workshop*

Discussion 1: Moderated by Gemma Kulk (Plymouth Marine Laboratory)

What auxiliary measurements are needed to maximize the utility of primary productivity measurements? In an ideal experimental design, what parameters would be measured v. what is optimal/feasible?

Discussion 2: Moderated by Mary Jane Perry (University of Maine)

What in situ measurements and systems (Argo, Bio-Argo, IOOS arrays, gliders, etc.) are needed for improving regional or global satellite estimates? Are we limited by instrument/model sensitivity? If so, what instrumentation and what sensitivity do we need?

Discussion 3: Moderated by Solange Duhamel (Columbia/LDEO)

What aspects of Primary Productivity measurements need to be standardized? Sampling time (impacts on photosynthetic efficiency)? Length of incubations? Scaling definitions (e.g. Euphotic Depth, Compensation Depth)? Spectral quality of light in incubations? Incubator design considerations? Are there ubiquitous practices that need to end?

Discussion 4: Moderated by Tomonori Isada (Hokkaido University)

What are the implications and uncertainties associated with simulated in-situ (deck, incubator) versus in situ incubations for measuring primary productivity? Do we need additional lab or in situ inter-comparison exercises to nail down outstanding issues such as uncertainties? If so, what do we compare, does it matter where, why?

Discussion 5: Moderated by Joaquim Goes (Columbia/LDEO)

How do we reconcile the inability of having a biological rate standard? Should we consider using a "gold" standard of primary productivity by which to compare all methods? Should we be developing archives of non-traditional PP or NCP for use in large scale satellite cal/val efforts? If so, how do we intercompare results?

Discussion 6: Moderated by Ana Fernandez Carrera (Universidade de Vigo)

What are the main caveats for comparing primary production measurements by ^{13}C and ^{14}C ? Are they accounting for the same process? With similar sampling/incubation procedures, do they yield different absolute rates? If so, could we account for that difference and compare available datasets or future measurements?

Discussion 7: Moderated by Ryan Vandermeulen (NASA GSFC)

What are the desired input satellite/model products for satellite-based PP modeling estimates? Do we need others (new ones, if so, what?)? How good do these need to be to not be constrained by their uncertainties?

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