

*Temporal Variability in Barrel Sponge Respiration dominating  
Conch Reef, FL Keys: Surprises from a Cabled Observatory*



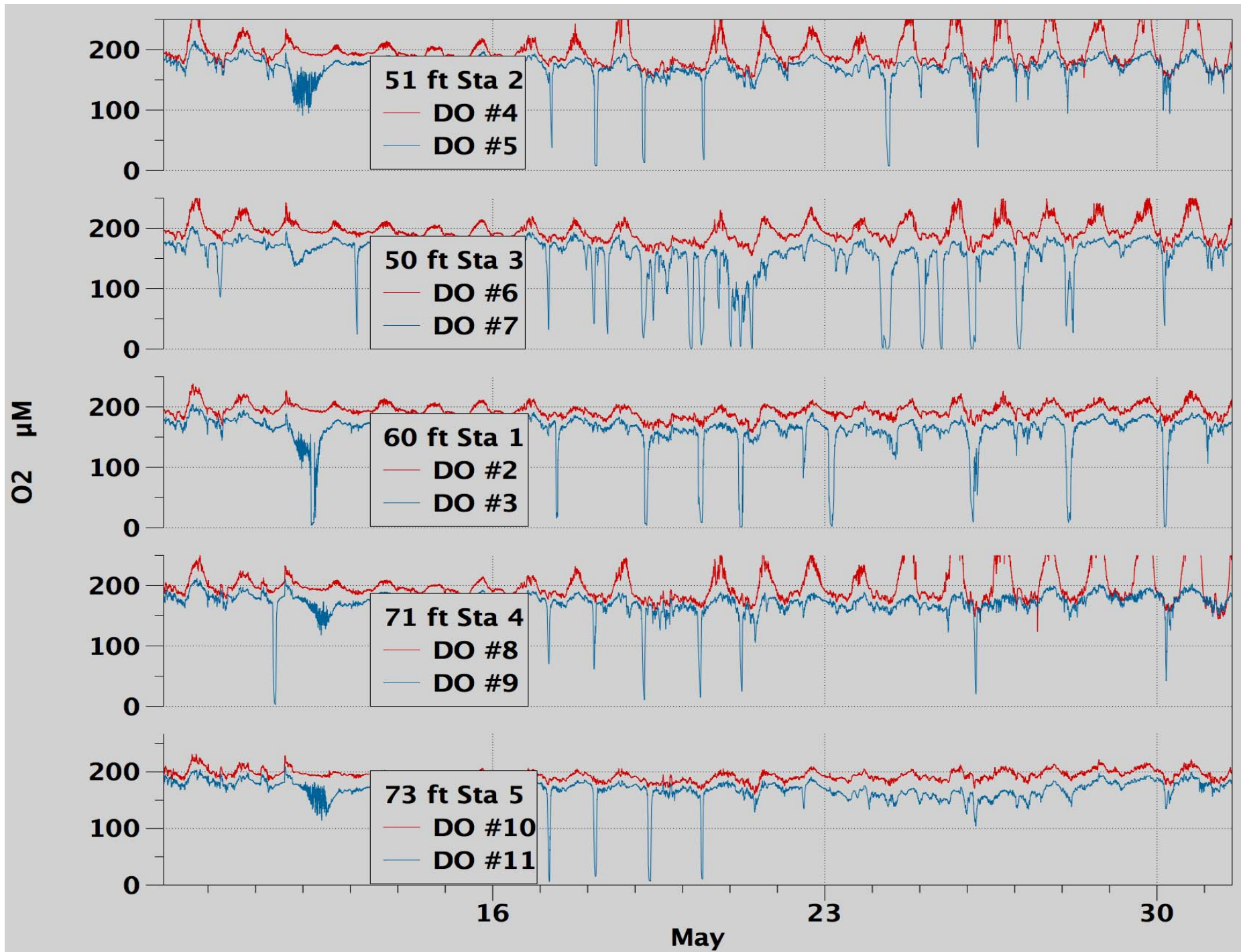
## *Surprises from a Cabled Observatory...*

- *That it all worked*
  - *That we all survived diving the 6+ ft seas (and the dive ladder)*
  - *That we were able to give this talk*
- and*
- *What in the heck are those sponges doing?*

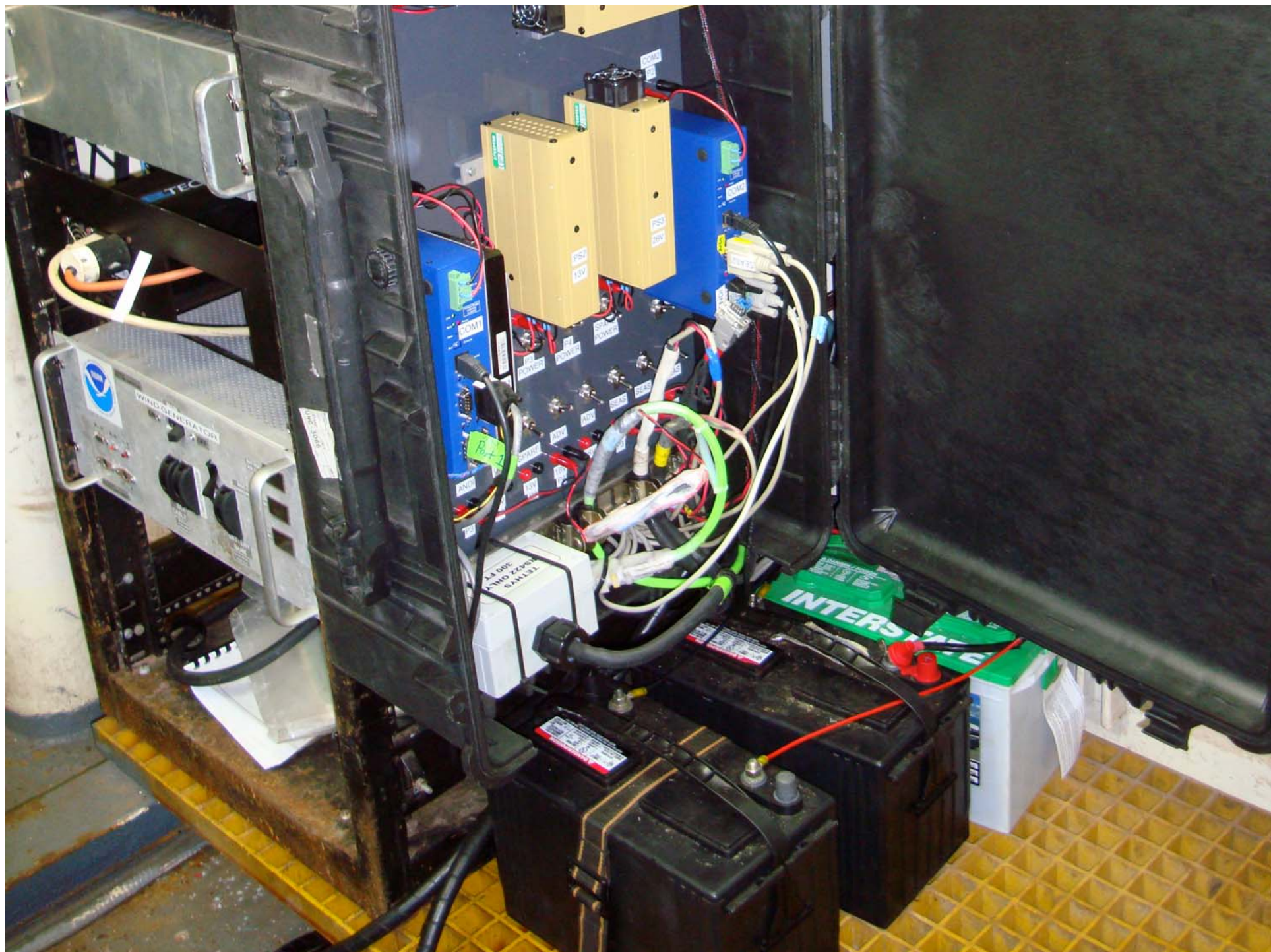
## Nitrogen Fluxes by Coral Reef Sediment and Sponges (mmol N m<sup>-2</sup> d<sup>-1</sup>)

Process:	DON Uptake	N <sub>2</sub> Fixation	DIN Flux	Nitrification	N <sub>2</sub> Production
<b>Sediments</b>	n.d.	0.038 (.011) <sup>a</sup>	0.408 (.222) <sup>b</sup>	n.d.	0.625 (.264) <sup>c</sup>
<b>Sponges</b>	~9	~0.025 (.025) <sup>d</sup>	11.8 (1.92) <sup>e</sup>	>3.4	>2.3

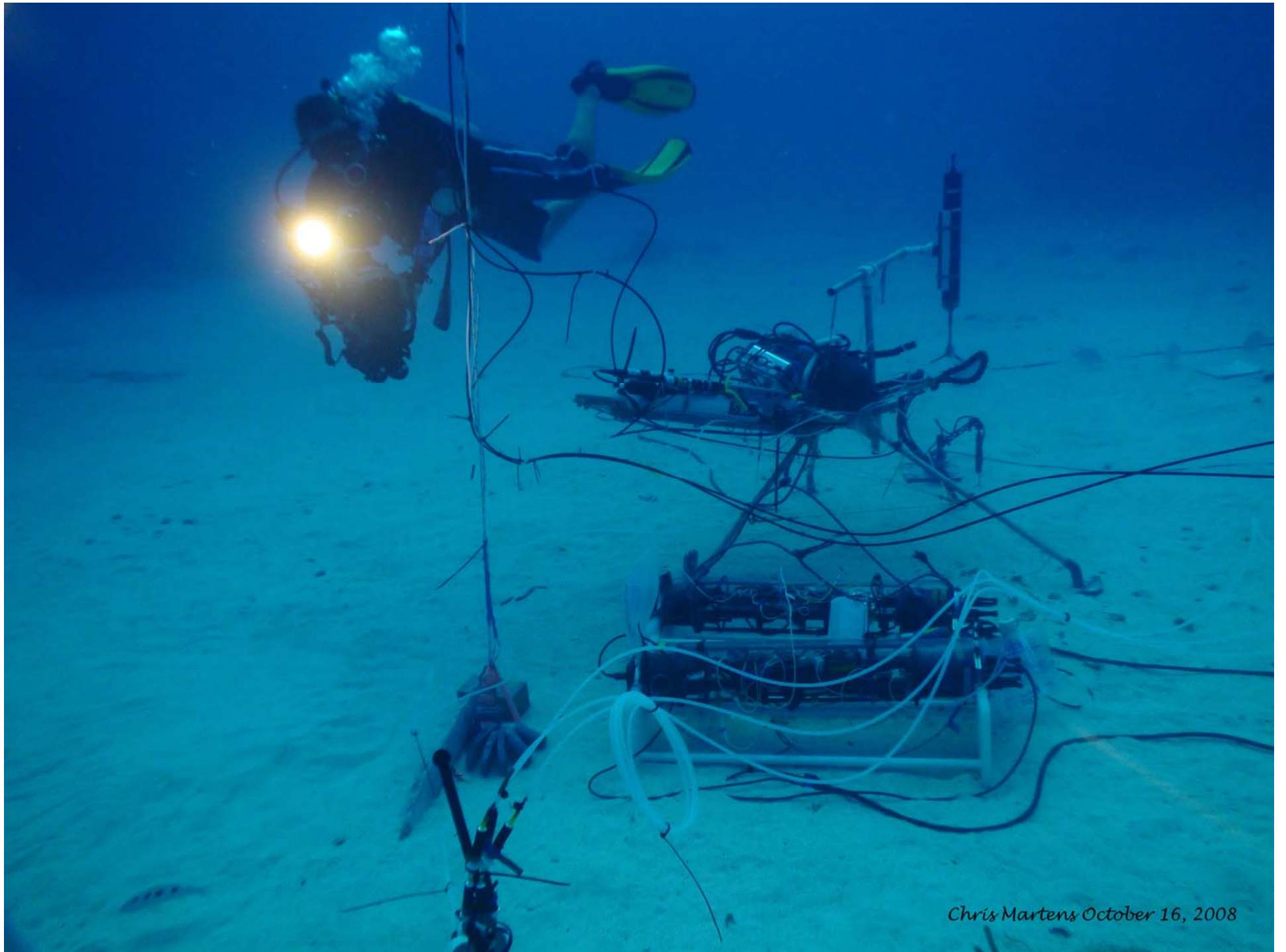
*n.d* = no data found; brackets= one std. dev. <sup>a</sup>Alongi et al. 2008 <sup>b</sup>(Corredor and Morell 1985; Capone et al. 1992; Lourey et al. 2001) <sup>c</sup>(Alongi et al (2008) <sup>d</sup>Southwell (2007) <sup>e</sup>(Corredor et al. 1988; Diaz and Ward 1997; Southwell et al. 2008a)







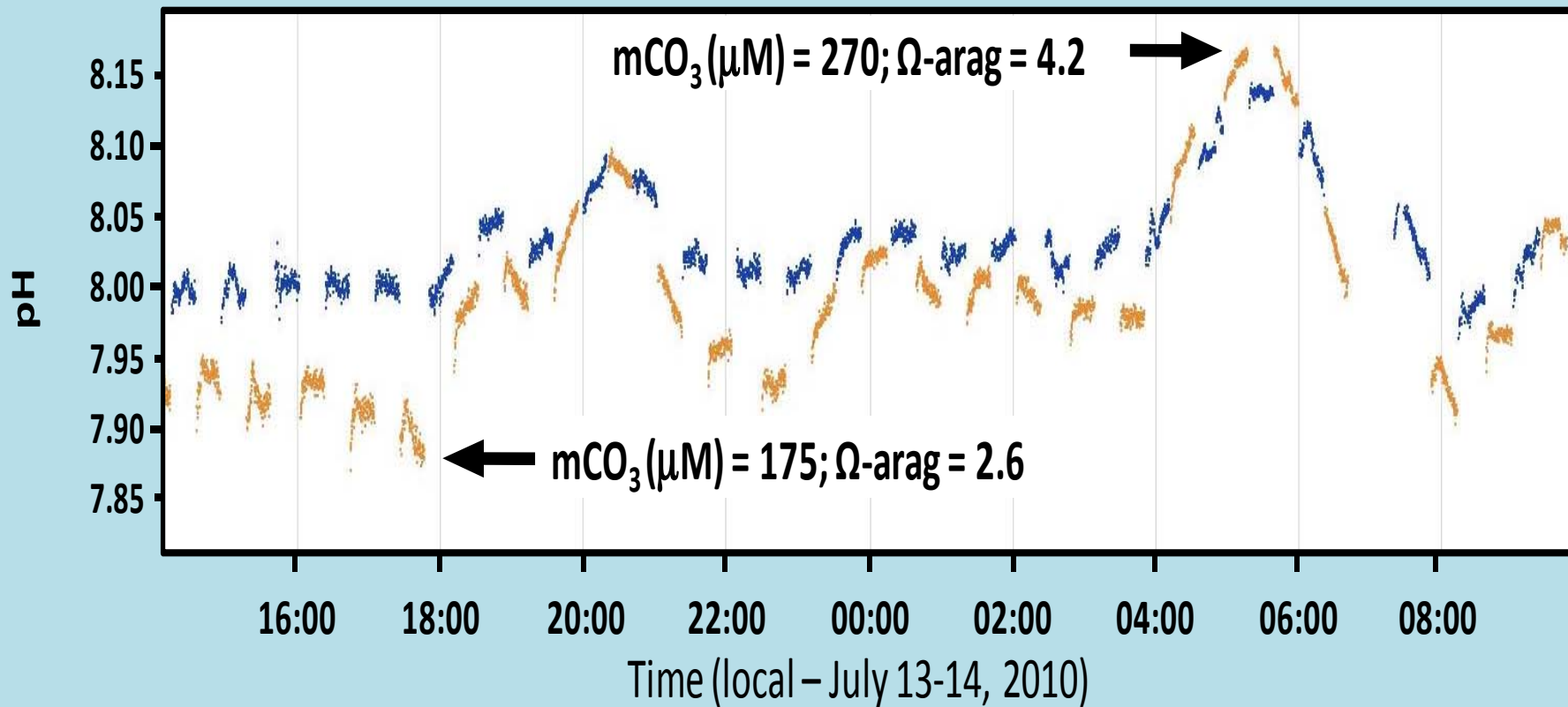




*Chris Martens October 16, 2008*

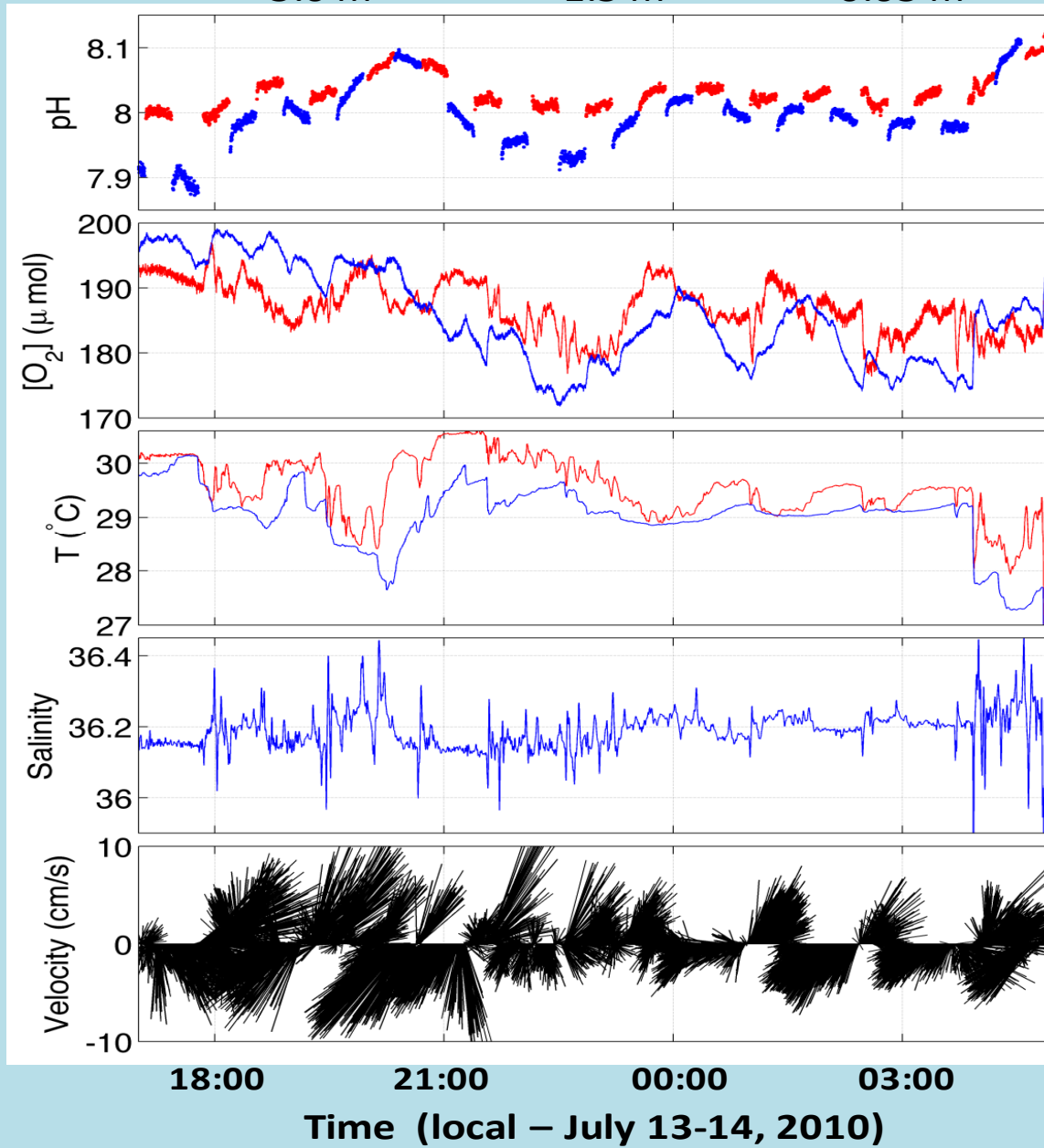


sampling height above bottom = ■ 5 m ■ 0.05 m



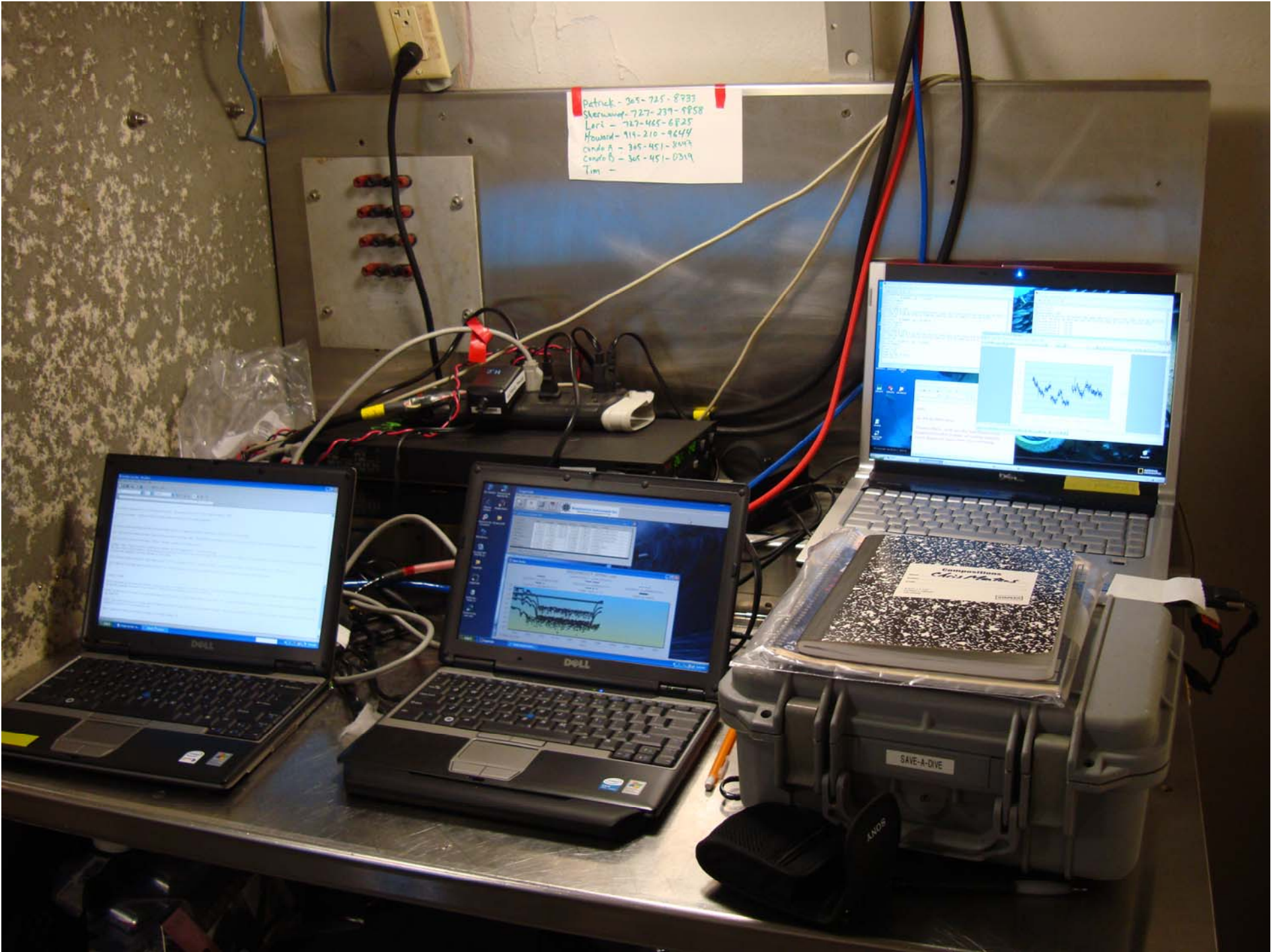
**Legend: data collection height above bottom**

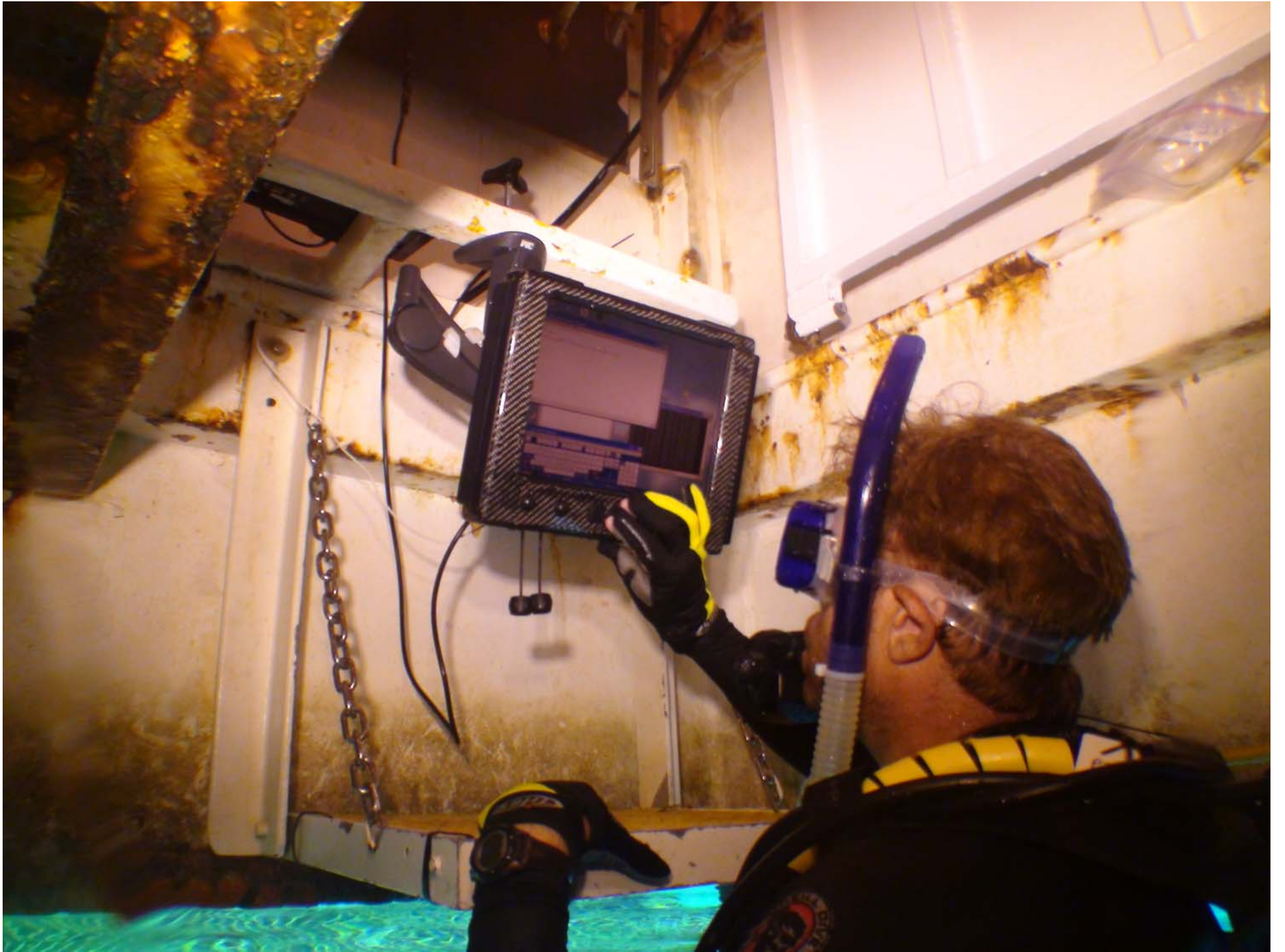
**5.0 m      1.5 m      0.05 m**

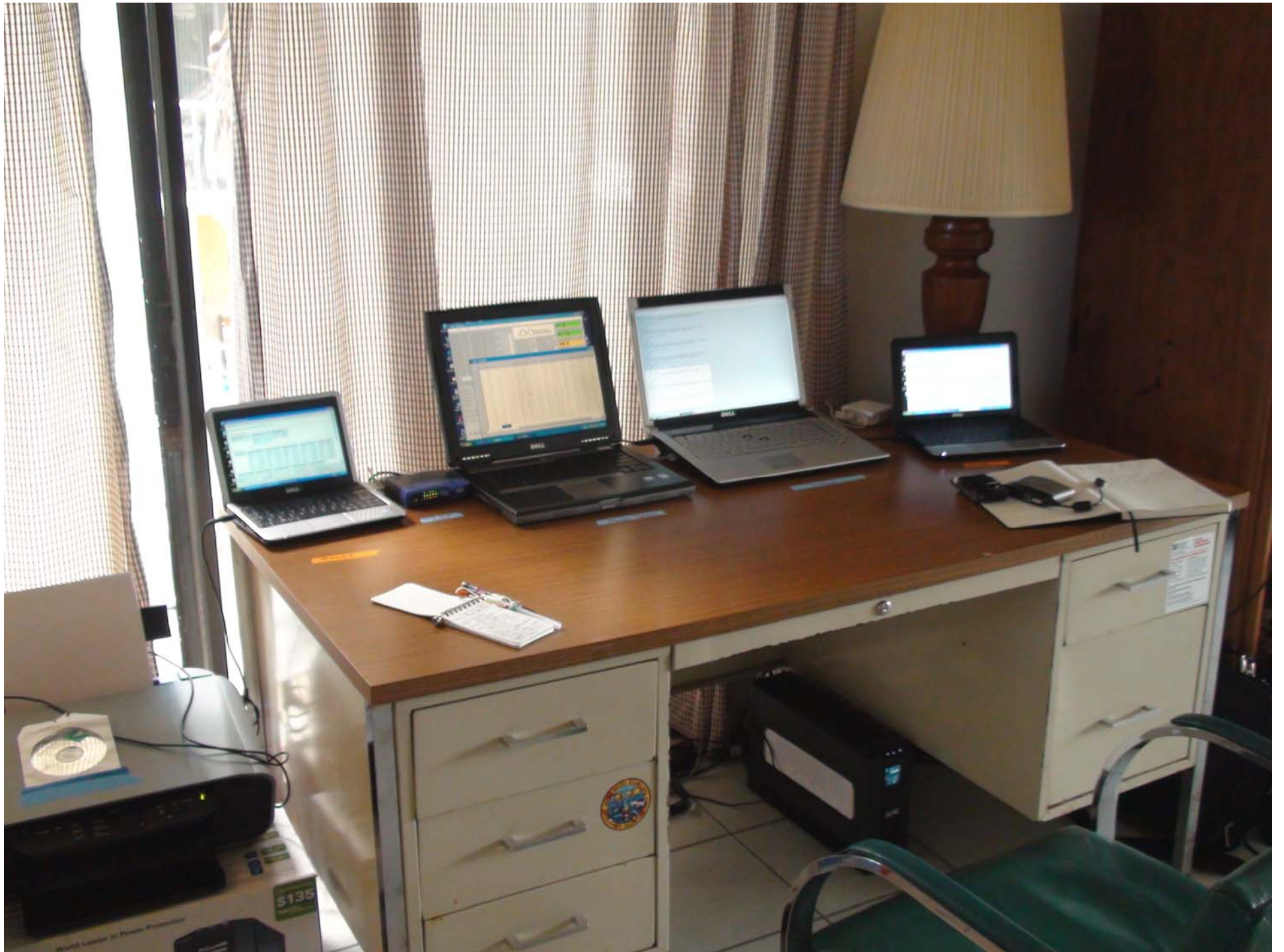




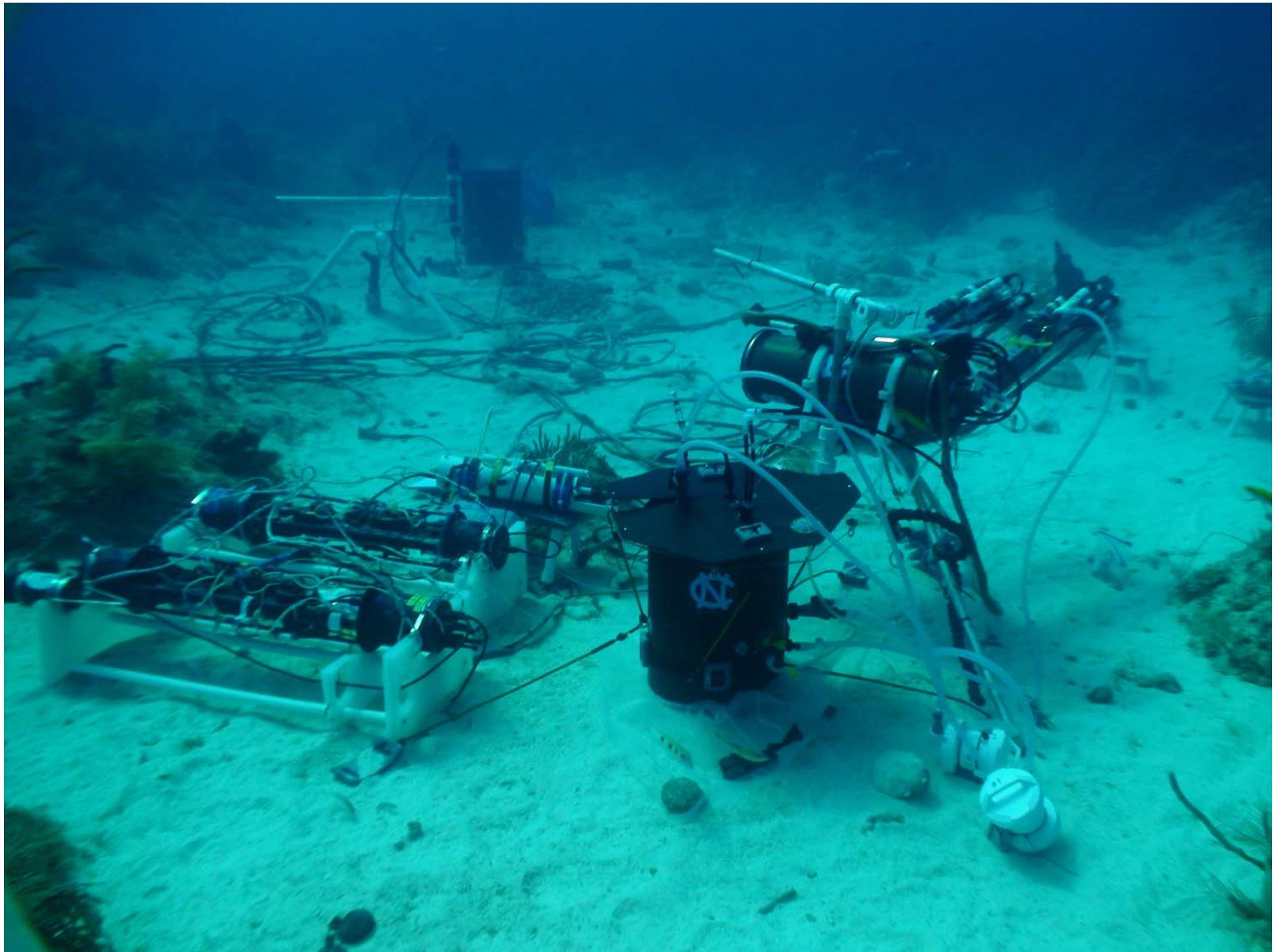
Petrick - 205-725-8733  
Sherwood - 727-237-9958  
Lori - 727-465-6825  
Howard - 918-210-9644  
Cande A - 305-451-3047  
Cande B - 305-451-0319  
Tim -



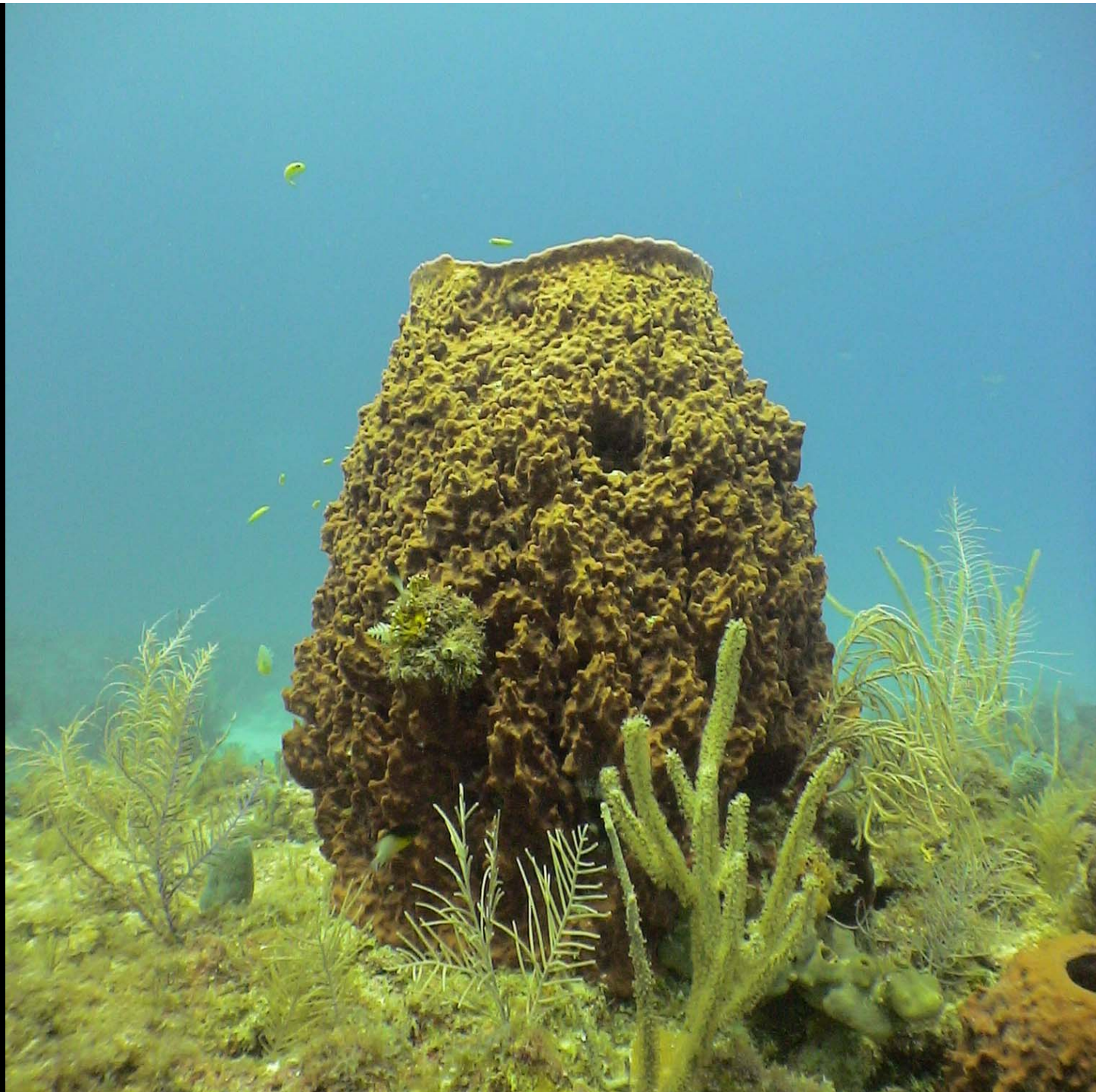


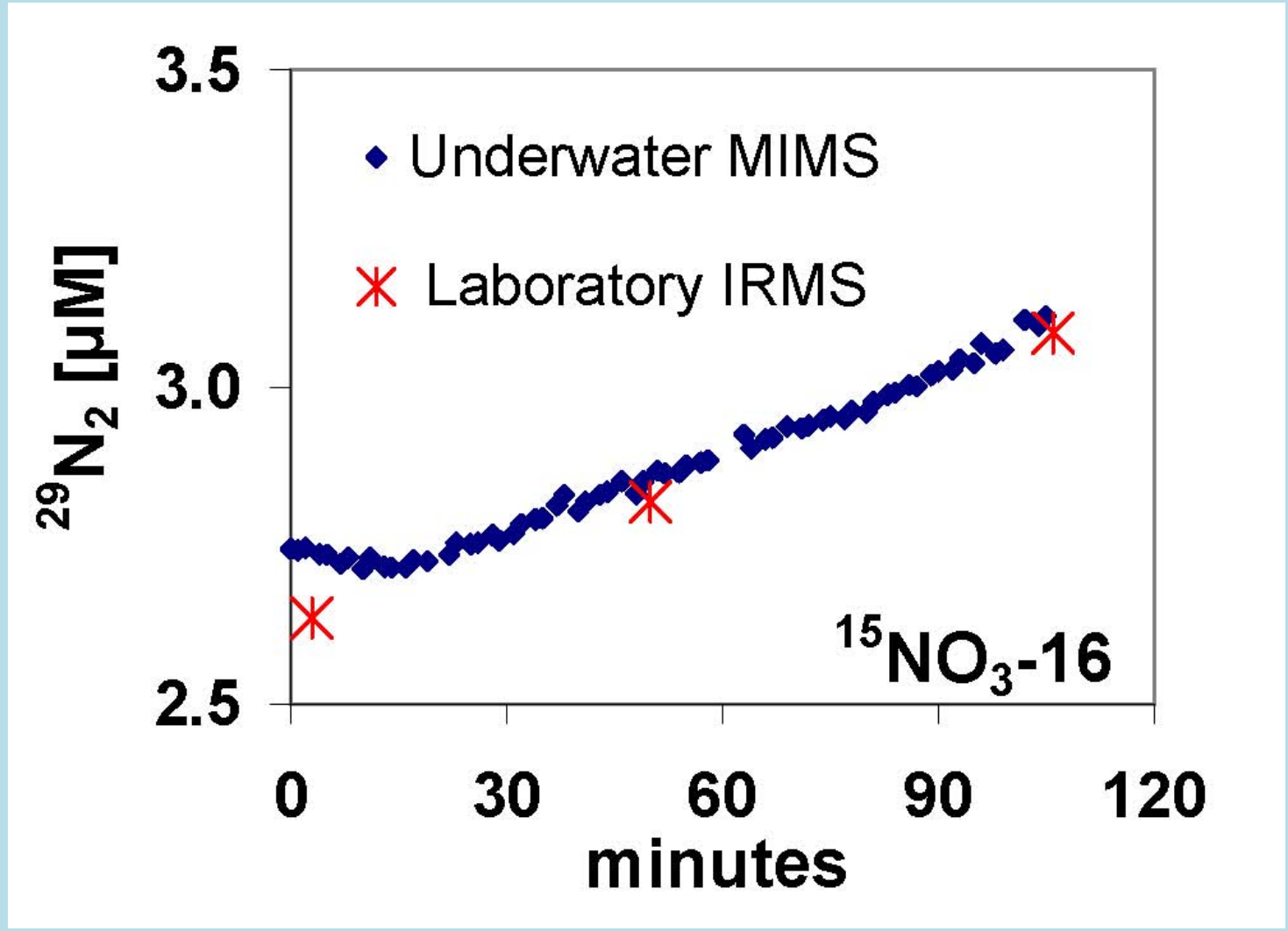




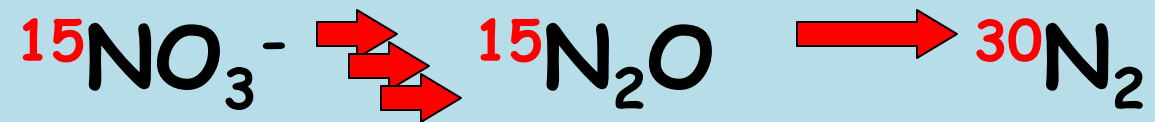




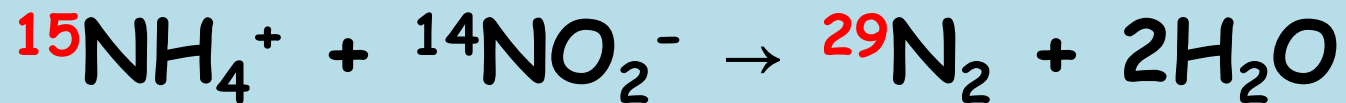




# Denitrification



ANAMMOX



## Nitrogen Fluxes by Coral Reef Sediment and Sponges (mmol N m<sup>-2</sup> d<sup>-1</sup>)

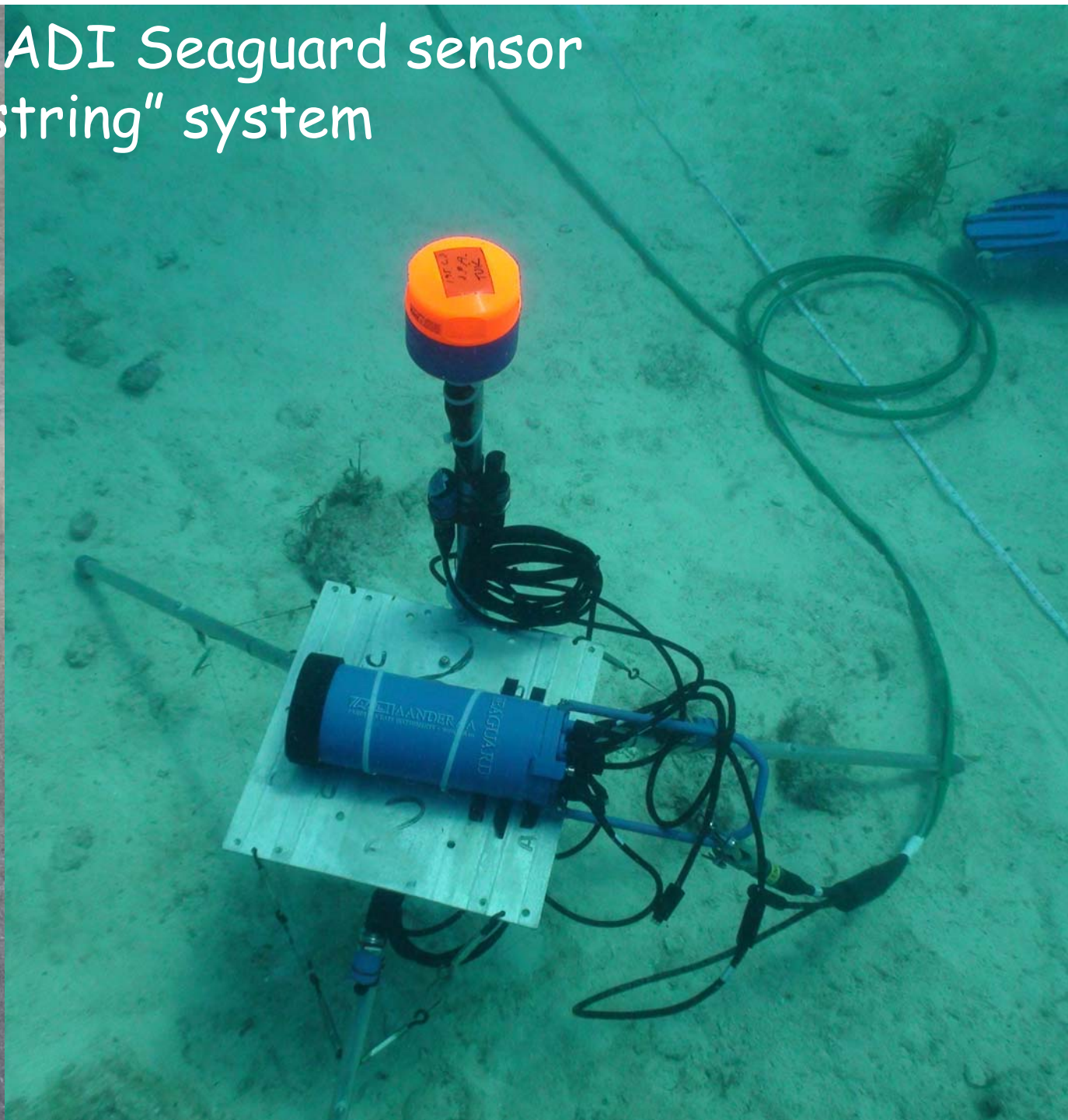
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# AADI Seaguard sensor "string" system

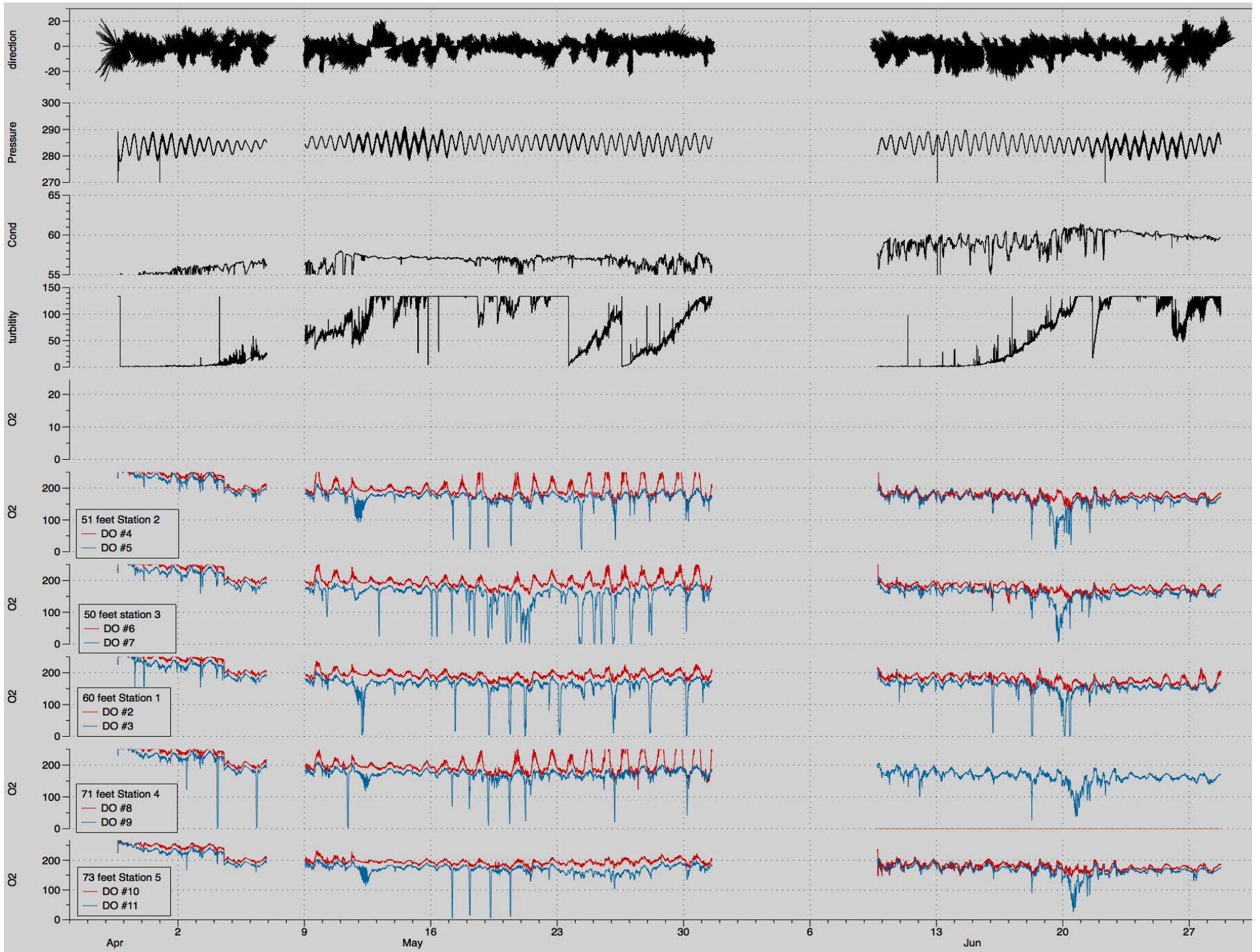


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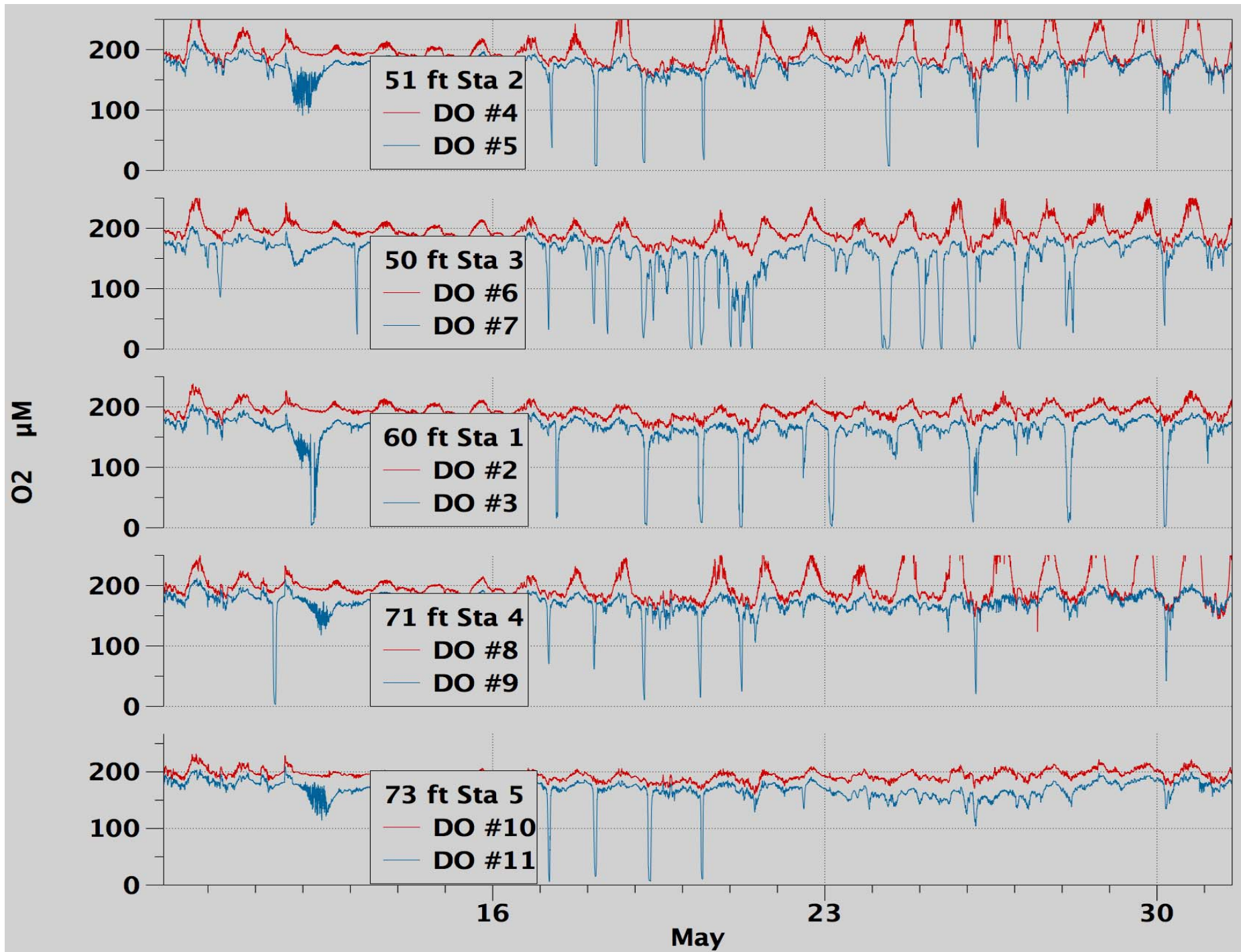


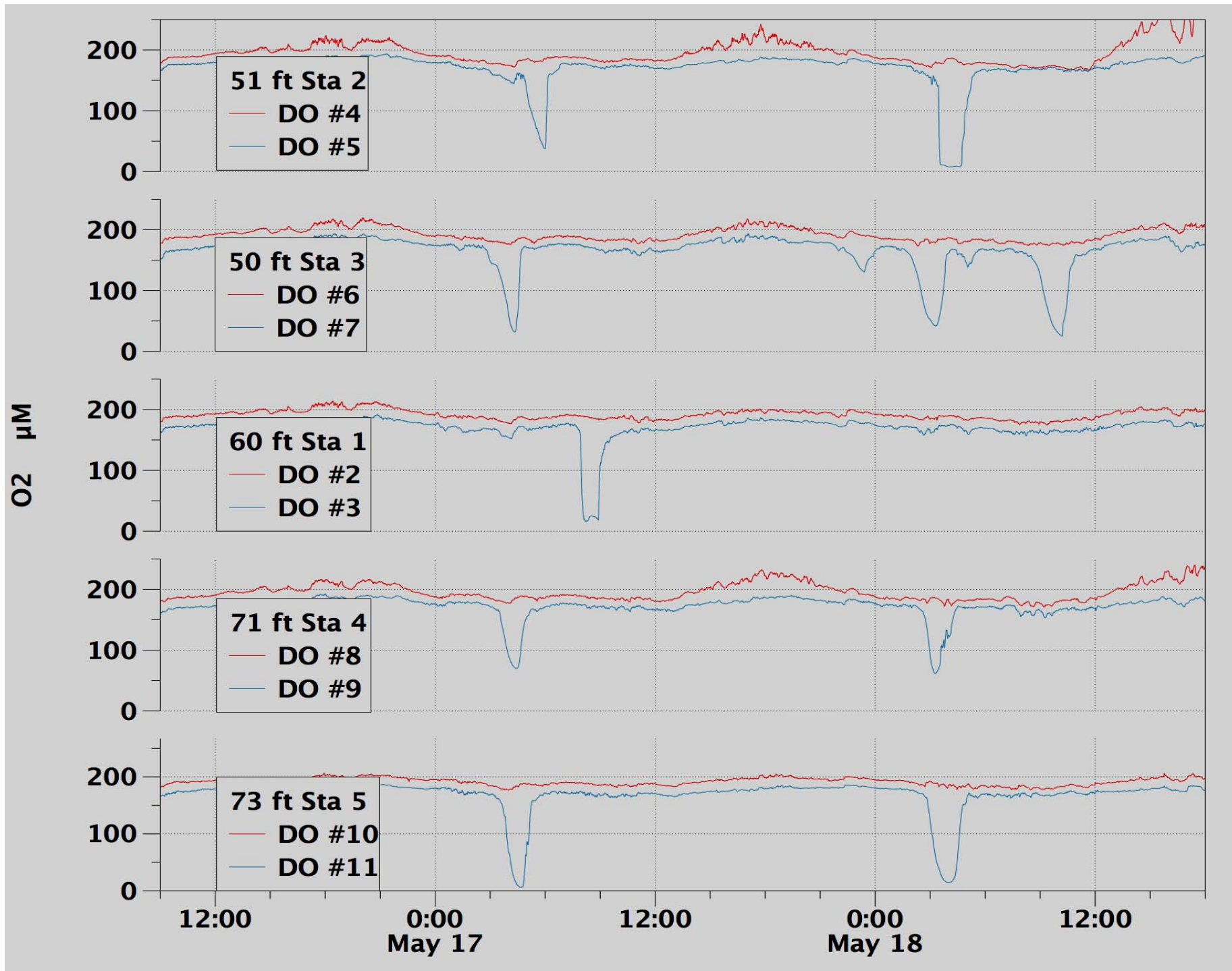


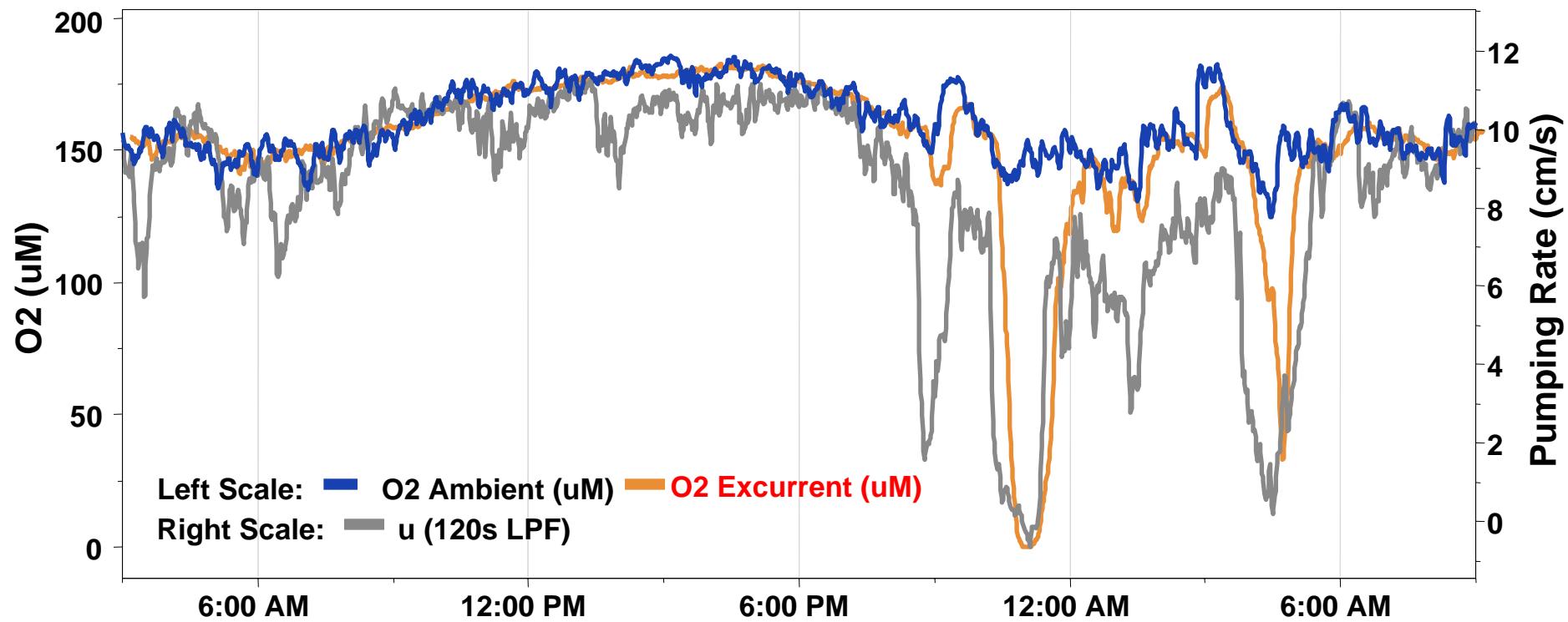




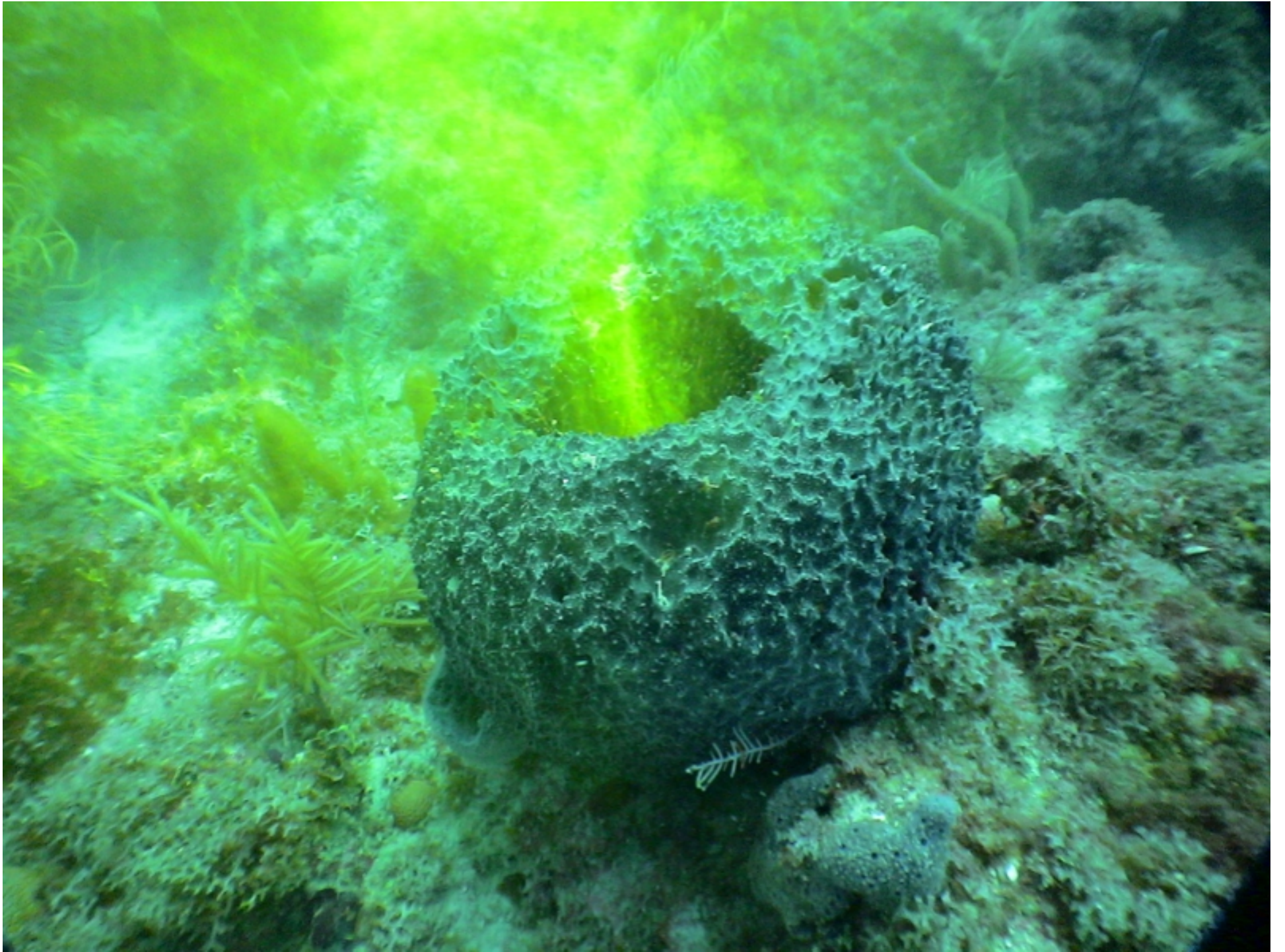








June 11-12, 2010



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# Primary Investigators

**UNC Chapel Hill:** Chris Martens; Niels Lindquist; Howard Mendlovitz; Patrick Gibson; Dan Hoer; Meredith Kintzing

**WHOI:** Rich Camilli

**University of Hawaii:** Brian Popp

**Duke University:** Jim Hench

**U. South Florida:** Pam Hallock-Muller; Bob Byrne; Sherwood Liu

# Funding and Field Support

**Chemical Oceanography Program NSF; Aquarius Reef Base NURC- UNCW**

**NURC-Key Largo: Aquarius Reef Base and Dayboat staff**

# Private Sector Partners

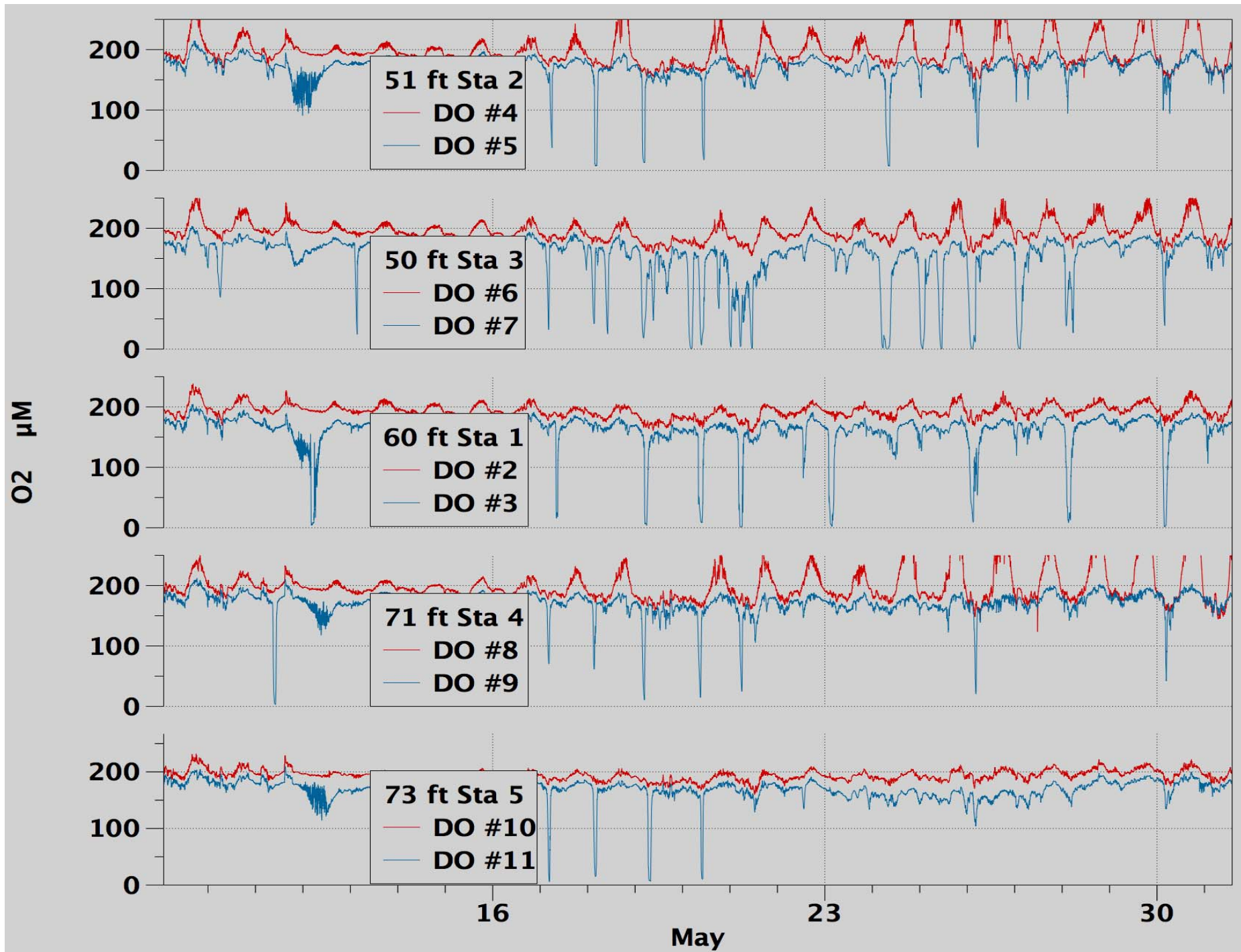
**Aanderaa Data Instruments; Monitor Instruments LLC;**









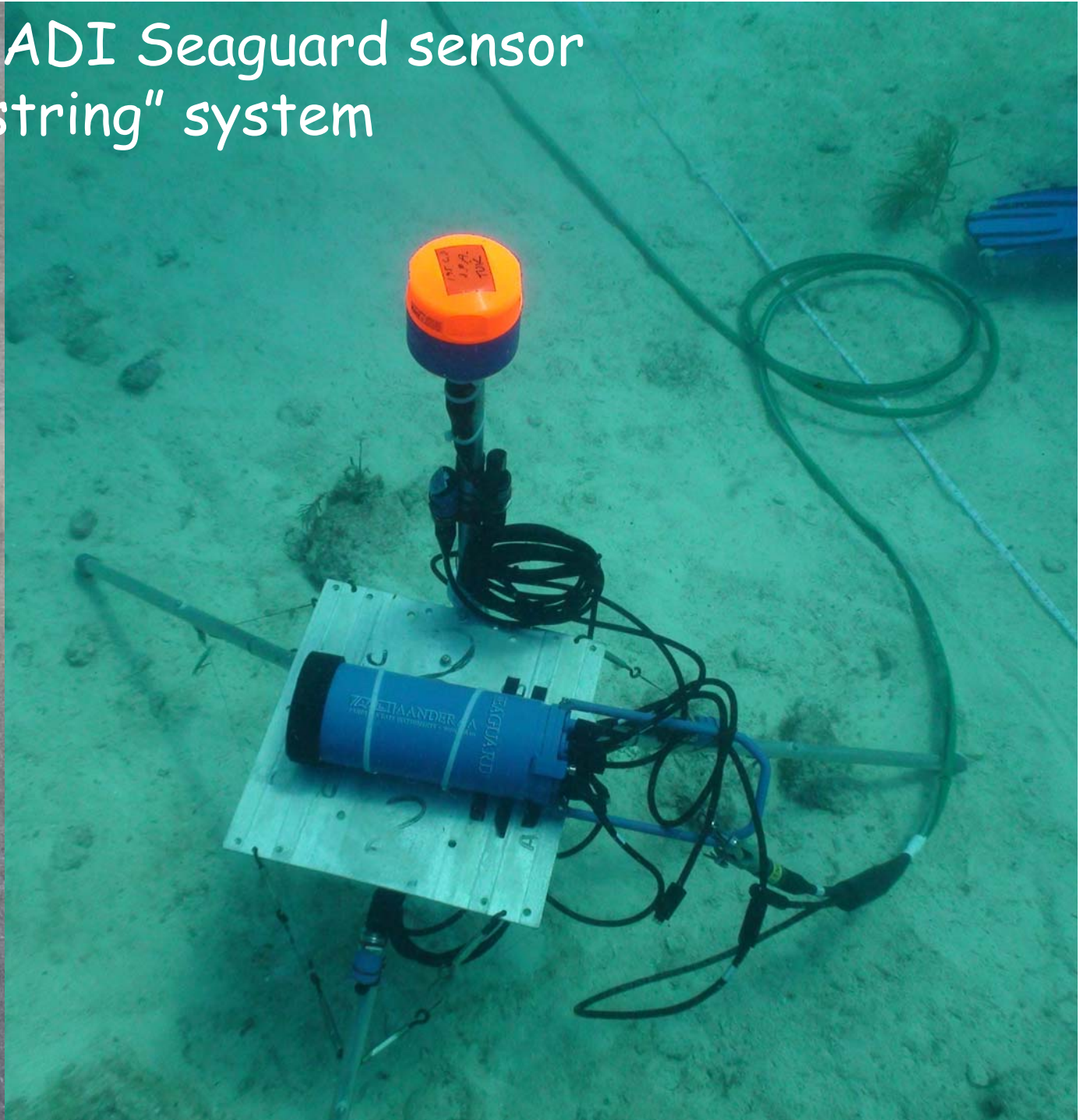


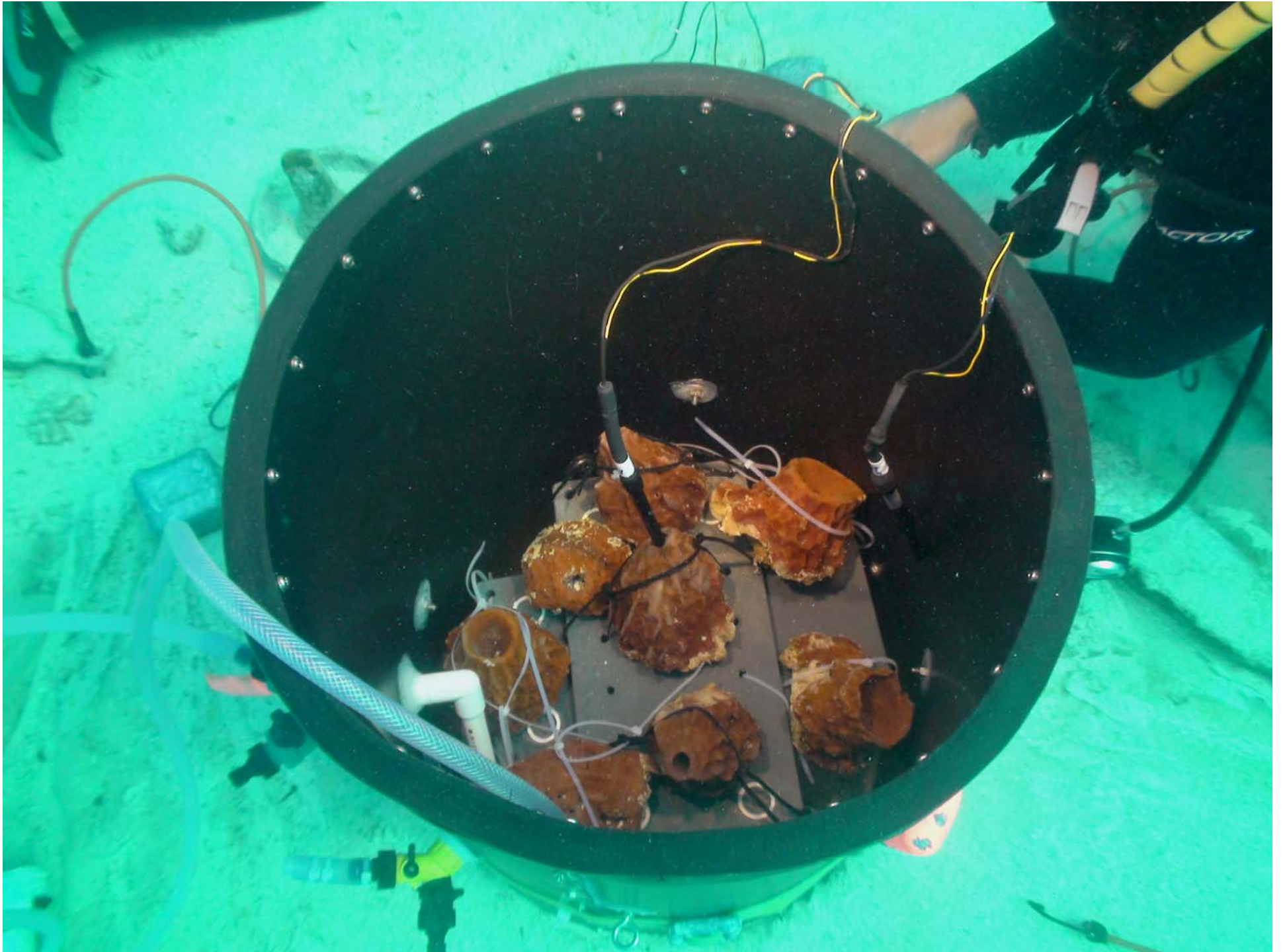
<b>DIN SOURCE</b>	<b>DIN FLUX</b> mmol m <sup>-2</sup> d <sup>-1</sup>	<b>SITE</b>	<b>REF.</b>
coral sediment	1.7	GBR	Capone et al. 1992
coral cavities	1.4	Caribbean	Scheffers et al. 2004
sediment	0.6	Hawaii	Stimson & Larned 2000
sponge – <i>P. zoei</i>	5.8-10.9	Caribbean	Diaz & Ward 1997
<b>Conch Reef sponges</b>	<b>13.4</b>	<b>FL Keys</b>	<b>Southwell et al 2008a L&amp;O</b>

# AADI Seaguard sensor "string" system



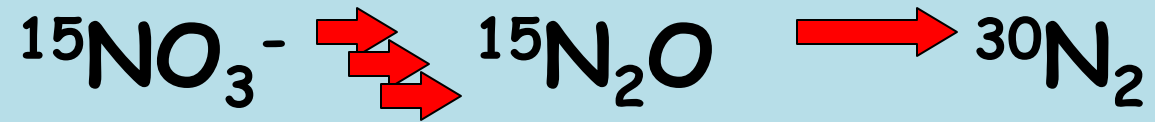
A







# Denitrification



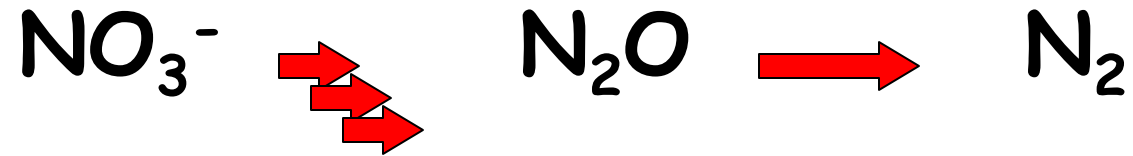
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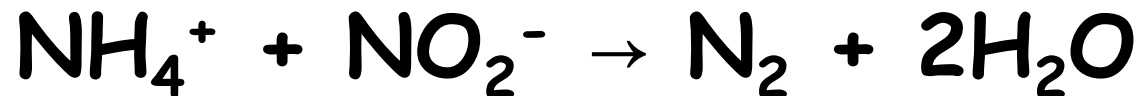




# Denitrification



Anammox



## Factors

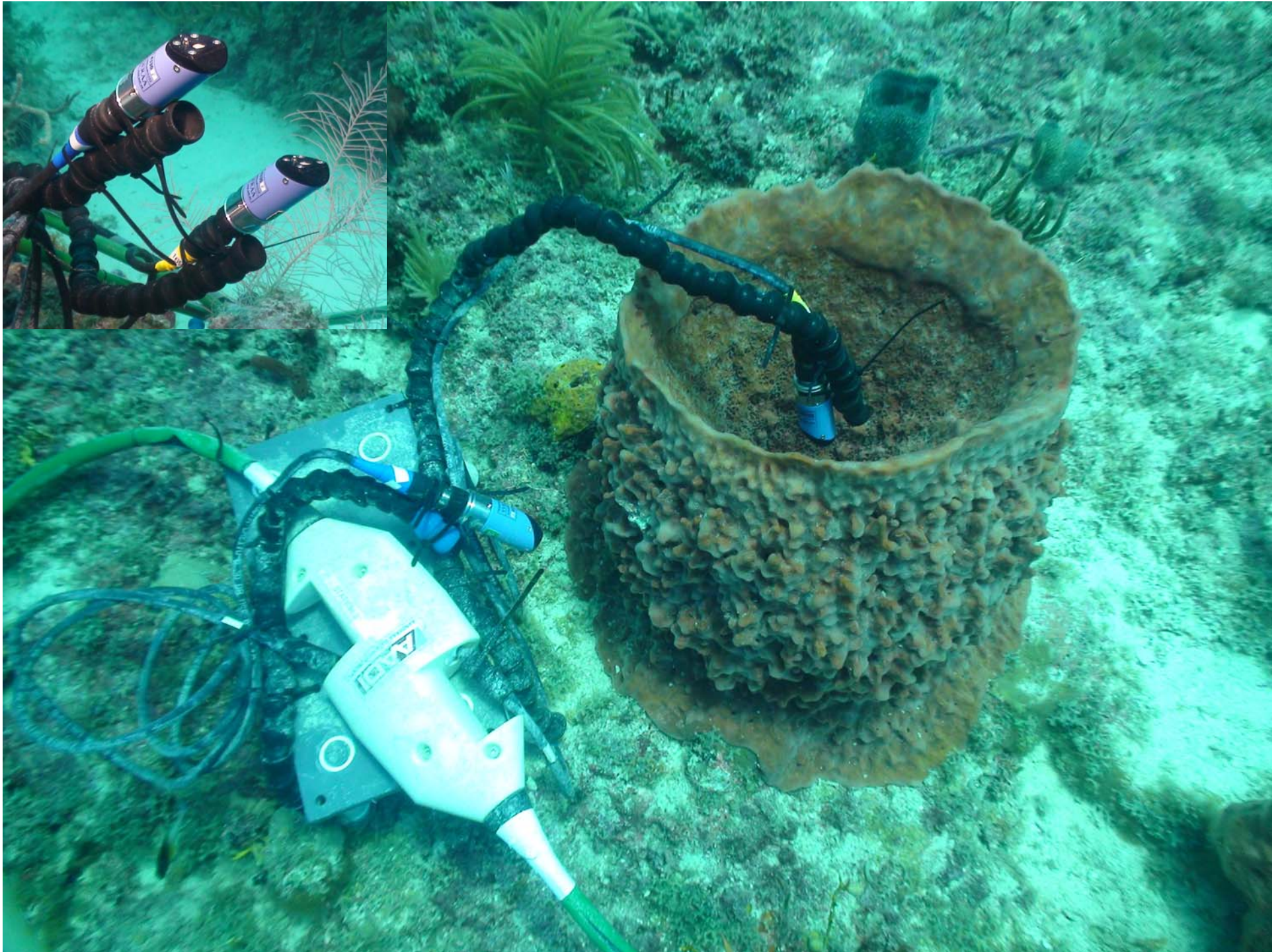
- Abundant organic matter
- Available  $\text{NO}_3^-$  &  $\text{NH}_4^+$
- Low oxygen

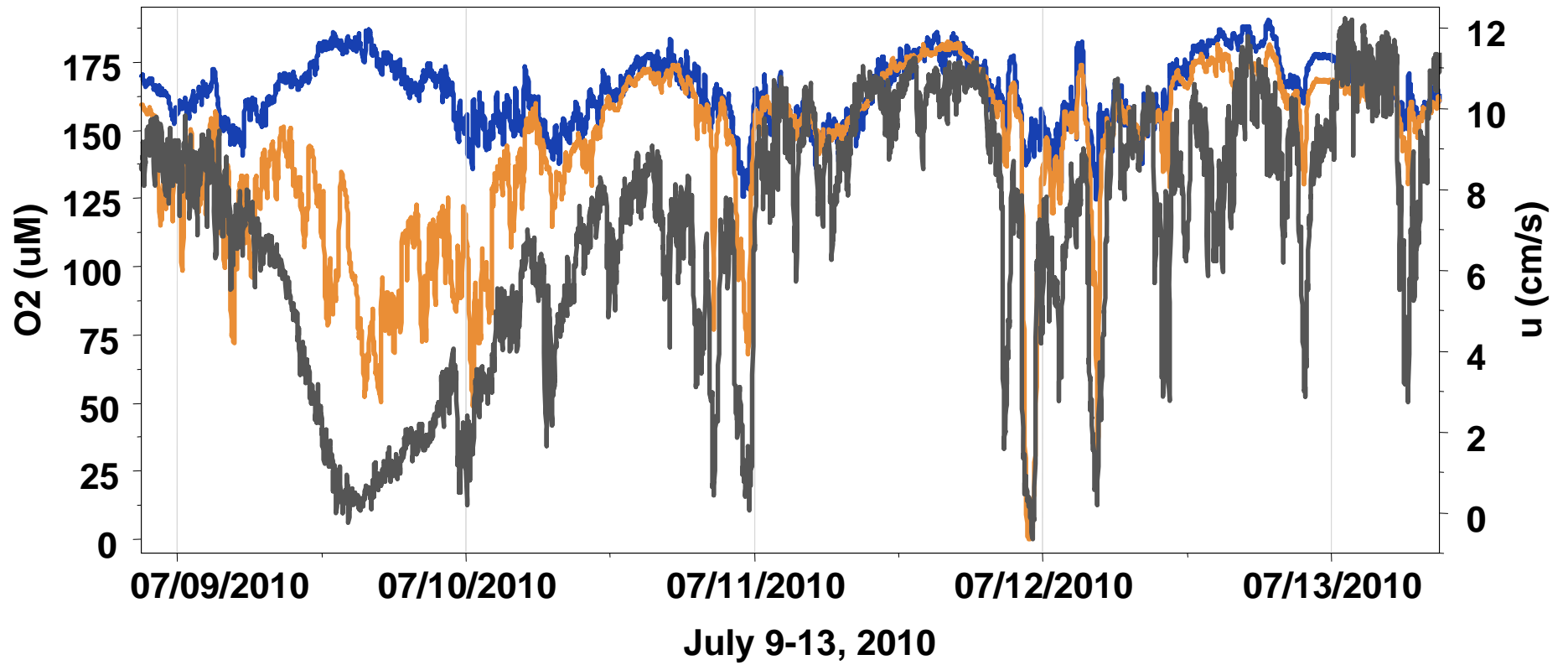
*Ircinia felix* - tetrazolium salts











Left Scale: ■ O2 Ambient ( $\mu\text{M}$ ) ■ O2 Excurrent ( $\mu\text{M}$ )

Right Scale: ■  $u$  (120s LPF)

