

Nov 06, 2018

Newport Beach Pier Weekly Sampling Protocol

DOI

dx.doi.org/10.17504/protocols.io.pcudiww

Jayme Smith¹, Emily Eggleston¹

¹University of Southern California

Caron Lab - Protistan Ec...



Jayme Smith

University of Southern California

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DOI: <https://dx.doi.org/10.17504/protocols.io.pcudiww>

Protocol Citation: Jayme Smith, Emily Eggleston 2018. Newport Beach Pier Weekly Sampling Protocol. **protocols.io**
<https://dx.doi.org/10.17504/protocols.io.pcudiww>

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Protocol status: Working

We use this protocol and it's working

Created: April 10, 2018

Last Modified: November 06, 2018

Protocol Integer ID: 11380

Keywords: newport beach pier weekly sampling protocol, protocol

Troubleshooting

Water Collection

- 1 Seawater is collected with a 3x rinsed (in seawater) bucket that is lowered with a rope to the water. The rinsed bucket is used to collect water to triple rinse a 2L polycarbonate bottle, a 1L cod-end, and an acid washed 30mL syringe. Then water is collected in the bucket and the syringe for the discrete sample collection (described in next section) is immediately filled. After filling the syringe the temperature is immediately measured with a total immersion thermometer.

Samples for dissolved algal toxins and dissolved nutrients are collected in the field (see 'Discrete Sample Collection' for details) from water collected in the bucket. 2L of water is poured into the rinsed 2L polycarbonate bottle and transported to the laboratory in a cooler for additional processing (see 'Discrete Sample Collection' for details).

A 20µm mesh plankton net with a 1L cod-end is used to collect a vertical net tow at a depth of 1 m. The net is pulled up and down ~2 meters, 4 times. The cod-end is transported to the laboratory in a cooler for additional processing.

Samples are always collected on Mondays unless there is a holiday and/or personnel are not available to collect samples. In these instances, samples are collected on the next day possible.

Discrete Sample Collection

- 2 The following discrete samples are collected each week

In field discrete sample collection

Dissolved nutrients (must be collected 1st to minimize risk of contamination):

- Whole water from the clean 30mL syringe (described above) is passed through a 0.2 µm cellulose luer-lock filter and collected into an acid washed and 3x filtrate washed scintillation vial. The filtrate is frozen at -20°C until analysis.

Dissolved algal toxins:

- Whole water from the clean 30mL syringe (described above) is passed through a 0.2 µm cellulose luer-lock filter and collected into 2mL screw top cryovials. The filtrate is frozen at -20°C until analysis.

In laboratory discrete sample collection

Particulate algal toxins:

- Particulate domoic acid samples are collected via filtration of 200mL of whole water onto a gf/f filter. Particulate saxitoxin samples are collected via filtration of 500mL of whole water onto a gf/f filter. Samples are frozen at -20°C until analysis.

Chlorophyll *a*:

- 100mL of whole water is gently filtered onto a gf/f filter and filters are placed into 5mL glass tubes. Samples are stored in foil and frozen at -20°C until analysis.

Fixed whole water:

- Whole water is fixed in a 125mL French Square bottle with formaldehyde at a final concentration of 3.7%. Samples are stored at 4°C until analysis.

Fixed net tow:

- A 20mL aliquot of the net tow sample is fixed in a glass scintillation vial with formaldehyde at a final concentration of 3.7% and archived at 4°C.

Sample processing

- 3 **Relative abundance** is assessed with a live aliquot of the net tow sample on the day of sample collection. 3mLs of the net tow sample are aliquoted into 3 wells of a 6-well plate. The sample is examined and relative abundance of organisms is assigned according to the following scale: ~None, Rare (R) <1%, Present (P) 1-9%, Common (C) 10-24%, Abundant (A) 25-49%, Dominant (D) >50%

Cell counts are conducted following the Utermohl method. A minimum of 40 fields of view at the 40x objective are counted, 25 mL of sample is settled, yielding a detection limit of 3 cells/mL.

Particulate domoic acid is analyzed with ELISA (Mercury Science, Durham, NC). The method as applied yields a detection limit of 0.02 µg/L

Chlorophyll *a* samples are extracted in 100% acetone in the dark at -20°C for 24 hours and analyzed using the non-acidification method with a Trilogy fluorometer (Turner Designs, San Jose, CA).

Dissolved nutrient samples are sent to UCSB Marine Science Institute for analysis.

Note: Refer to Seubert et al., 2013 for additional analysis details for particulate domoic acid, chlorophyll *a*, dissolved nutrients and cell counts.

References



- 4 Seubert, E. L., Gellene, A. G., Howard, M. D., Connell, P., Ragan, M., Jones, B. H., Runyan, J. and Caron, D. A. (2013) Seasonal and annual dynamics of harmful algae and algal toxins revealed through weekly monitoring at two coastal ocean sites off southern California, USA. *Environ Sci Pollut Res Int*, **20**, 6878-95.