

Complementary Bioluminescent Study in Salt River, St. Croix, U.S. Virgin Islands
Project SARI-2013-SCI-0006

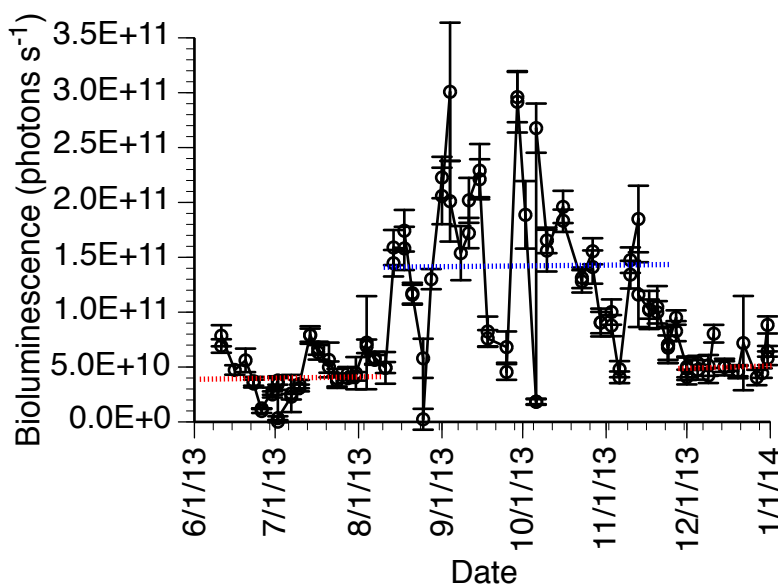
Final Report

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The six-month sampling period, from June 12 through December 31, 2013, included 56 nighttime sampling sessions representing twice weekly sampling. At each sampling date, bioluminescence and water quality measurements were made at the UVI sonde location, at a depth of approximately 1 m, and a near-surface water sample was taken and later preserved for enumeration of the luminescent plankton.

Measured bioluminescence was quite variable, and was affected by storm events, but it exhibited three general periods. The first period, from June until the middle of August, consisted of relatively low bioluminescence, with an average of 4.0×10^{10} photons/s (left red line). This was followed by a period of high bioluminescence that occurred from the middle of August through the end of November, with an average of 1.4×10^{11} photons/s (blue line). Finally there was again low bioluminescence during November and December, with an average of 5.4×10^{10} photons/s (right red line). None of these periods was characteristic of the overall average, which was 9.0×10^{10} photons/s, in that the high bioluminescence period was about 60% higher than the average, and the low bioluminescence periods were about 50% lower than the average.



Bioluminescence at Mosquito Bay, Vieques, Puerto Rico, made with similar instruments during fall 2010 had an average of 1.4×10^{11} photons/s, similar to the period of high bioluminescence at the Salt River lagoon.

Analysis of preserved water samples is ongoing, but bioluminescence was highly correlated with abundance of the dinoflagellate *Pyrodinium bahamense*, the most abundant luminescent phytoplankton in the lagoon.

Observations of bioluminescence, scored on a 5 point scale, were not always correlated with measured bioluminescence. High scores were recorded during the period of high bioluminescence, but high scores were also occasionally reported during the periods of low bioluminescence. Observer scores of bioluminescence were affected by the amount of background illumination, such that bright bioluminescence could be perceived even though measured bioluminescence levels were relatively low.