|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| *Month* | *Mean Bell Height (mm)* | *SE* | *-0.95* | *+0.95* | *n* |
| *Jan* | 61.02 | 1.16 | 58.74 | 63.30 | 52 |
| *Feb* | 60.02 | 0.77 | 58.50 | 61.53 | 118 |
| *Mar* | 63.90 | 0.45 | 63.03 | 64.78 | 353 |
| *Apr* | 62.65 | 0.42 | 61.82 | 63.48 | 391 |
| *May* | 66.78 | 0.53 | 65.74 | 67.82 | 251 |
| *Jun* | 62.09 | 0.27 | 61.57 | 62.61 | 1000 |
| *Jul* | 71.34 | 0.38 | 70.60 | 72.08 | 493 |
| *Aug* | 67.32 | 0.42 | 66.49 | 68.14 | 400 |
| *Sep* | 62.28 | 0.44 | 61.41 | 63.14 | 361 |
| *Oct* | 65.20 | 0.50 | 64.23 | 66.17 | 286 |
| *Nov* | 58.82 | 0.42 | 58.00 | 59.65 | 400 |
| *Dec* | 68.67 | 0.76 | 67.18 | 70.15 | 123 |

Table S1. Mean bell height of *Alatina moseri* medusae collected in 2001.



Figure S1. Histogram representing the distribution of bell height in medusae of *Alatina moseri* collected at Waikiki Beach in 2001 (*n* = 4228).



Table S2. Monthly number of *Alatina moseri* medusae collected at Waikiki Beach from Jan 1998 to Dec 2011. Some years had 13 waning crescent lunar phases (8-12 days after full moon) instead of 12; thereby, two jellyfish arrivals happened within the same month in five instances (indicated in yellow). In those cases, we used the average jellyfish counts.

|  |  |  |  |
| --- | --- | --- | --- |
|  | *Monthly* | *Annual* | *1-Year Lag* |
| ***Climatic variables*** |  |  |  |
| *Multivariate ENSO Index (MEI)* | -0.16 (p= 0.10) | -0.49 (p= 0.09) | -0.47 (p= 0.10) |
| *Pacific Decadal Oscillation (PDO)* | -0.10 (p= 0.21)  | -0.52 (p= 0.08) | -0.36 (p= 0.24) |
| *North Pacific Gyre Oscillation (NPGO)* | (*significant*) | (*significant*) | 0.56 (p= 0.06) |
|  |  |  |  |
| ***Biogeochemical variables*** |  |  |  |
| *Temp (oC)* | -0.004 (p= 0.9) | 0.09 (p= 0.77) | -0.28 (p= 0.36) |
| *Salinity (ppt)* | 0.04 (p= 0.70) | 0.14 (p= 0.64) | 0.47 (p= 0.11) |
| *Particulate Nitrogen (mmol.m-2)* | -0.14 (p= 0.12) | -0.29 (p= 0.34) | -0.51 (p= 0.07) |
| *Particulate Carbon (mmol.m-2)* | -0.07 (p= 0.44)  | -0.19 (p= 0.43) | -0.12 (p= 0.69) |
| *Chlorophyll a (mg m-2)* | 0.02 (p= 0.84) | -0.29 (p= 0.34) | 0.07 (p= 0.83) |
| *Prochlorococcus (# x10 11)* | -0.13 (p= 0.16) | -0.24 (p= 0.44) | 0.28 (p= 0.34) |
| *Eukaryotes (# x 10 11)* | 0.02 (p= 0.83) | 0.26 (p= 0.46) | -0.39 (p= 0.19) |
| *Heterotrophic bacteria (# x 10 11)* | -0.17 (p= 0.09) | -0.23 (p= 0.39) | -0.37 (p= 0.21) |
| *< 2mm (night) zoop. biomass (gDW m-2)* | 0.14 (p= 0.11) | 0.21 (p= 0.47) | -0.29 (p= 0.32) |
| *< 2mm (day) zoopl. biomass (gDW m-2)* | 0.09 (p= 0.32)  | -0.16 (p= 0.61) | -0.33 (p= 0.27) |
| *> 2mm (day) zoopl. biomass (gDW m-2)* | 0.07 (p= 0.58) | 0.32 (p= 0.21) | -0.31 (p= 0.29)  |
| *> 2mm (night) zoopl. biomass (gDW m-2)* | (*significant*) | (*significant*) | -0.21 (p= 0.49) |
| *Primary production (mgC m-2 day-1)* | 0.05 (p = 0.56) | (*significant*) | 0.1 (p= 0.75) |
|  |  |  |  |
| ***Local weather parameters*** |  |  |  |
| *Air temperature (oC)* | -0.04 (p= 0.62) | 0.27 (p= 0.34) | -0.28 (p= 0.34) |
| *Atmospheric pressure (mmHg)* | 0.03 (p= 0.71) | 0.13 (p= 0.67) | 0.22 (p= 0.47) |
| *Rainfall (mm)* | 0.05 (p= 0.53) | -0.22 (p= 0.45) | -0.43 (p= 0.14) |
| *Cloud cover (%)* | -0.01 (p= 0.81) | -0.37 (p= 0.23) | -0.49 (p= 0.08) |
| *Wind speed (km/h)* | -0.06 (p= 0.46) | -0.08 (p= 0.78) | 0.37 (p= 0.22) |
| *Wind direction (Degrees)* | 0.11 (p= 0.16) | 0.43 (p= 0.15) | -0.40 (p= 0.17) |
| *Humidity (%)* | 0.09 (p= 0.24) | 0.24 (p= 0.40) | -0.01 (p= 0.97) |

Table S3. Table showing the correlation coefficient of all non-significant relationships detected between environmental variables and numbers of box jellyfish counted at Waikiki Beach (Jan 1998 to Dec 2011). Coefficients and *p*-values were obtained using linear regressions (via General Regression Models after a non-significant relationship detected by the GAM; see methods), except for wind direction for which coefficients were obtained by a Circular-Linear correlation analysis. All variables were log-transformed and detrended before the analysis, except for wind direction (see Methods).