**Table S1**. Validations of DINEOF SST reconstruction against daily averaged buoy-measured SST during storm days. Correlation is given for all storm dates and the correlation for all non-storm days are given in parenthesis. Units of Bias and Root Mean Square (RMS) are °C.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Buoy ID | Observations | Correlation | Bias | RMS |
| Yucatan Channel – Gulf of Mexico | 42001 | 141 | 0.79 (0.95) | 1.53 | 1.80 |
| 42002 | 148 | 0.77 (0.94) | 1.59 | 1.83 |
| 42003 | 132 | 0.75 (0.90) | 1.91 | 2.13 |
| 42040 | 151 | 0.82 (0.95) | 1.43 | 1.74 |
| 42055 | 138 | 0.63 (0.94) | 1.81 | 2.01 |
| Mid Atlantic Bight – Sargasso Sea | 41001 | 176 | 0.88 (0.96) | 1.59 | 1.85 |
| 41002 | 176 | 0.86 (0.94) | 0.99 | 1.38 |
| 41010 | 234 | 0.86 (0.94) | 1.72 | 1.90 |
| 41047 | 95 | 0.91 (0.95) | 1.80 | 1.97 |
| 41048 | 127 | 0.92 (0.97) | 1.67 | 1.86 |
| 41049 | 89 | 0.78 (0.95) | 1.83 | 2.10 |
| 44088 | 234 | 0.88 (0.97) | 0.31 | 1.78 |