The NASA SPoRT SST composite uses the most recent NESDIS and OSTIA global SST composites yet ingests 7-days worth of satellite infrared (IR) data. Given the SPoRT SST composite ingests various dataset with different resolutions and multiple days worth of satellite SST data it is important to weigh those data appropriately. Therefore, the SPoRT SST compositing methodology uses two weights to calculate a time- and spatial resolution-weighted SST 7-day composite (Eq. 1).

$$SST_F = \frac{\sum_d (S*R*L)}{\sum_d (R*L)} \quad (1)$$

where $SST_F$ is the final SPoRT SST 7-day composite value, $S$ is data source SST, $R$ is the resolution weight factor, and $L$ is the latency factor. More specifically, the latency factor is the inverse of the number of days latent. For example, if the data source is from today the latency factor would be 1 (i.e., 1/1 =1) but if the source data was from yesterday the latency factor would be 0.5 (i.e., 1/2 = 0.5). As a result, the most recent SST data are weighted larger. The resolution weight factor favors higher resolution satellite data over the lower resolution global gridded datasets. The numerator represents the summation of weighted SSTs derived from the various data sources and the denominator represents a normalization of those weighted SST. Table 1 demonstrates example data for the SPoRT SST 7-day composite methodology when only one satellite is considered. Using the data from Table 1, the SPoRT SST 7-day composite value can be calculated to be ~278.5 K (see Appendix A for the calculation of this value).

| Latency Factor | Satellite IR SST (K) | Satellite IR Res. Factor | OSTIA SST (K) | OSTIA Res. Factor | NESDIS SST (K) | NESDIS Res. Factor |
|---|---|---|---|---|---|---|
| 1 | - | 1.0 | 280.2 | 0.1 | 276.7 | 0.5 |
| 0.5 | 279.3 | 1.0 | - | - | - | - |
| 0.333 | 279.6 | 1.0 | - | - | - | - |
| 0.25 | - | 1.0 | - | - | - | - |
| 0.2 | 279.9 | 1.0 | - | - | - | - |
| 0.166 | 276.5 | 1.0 | - | - | - | - |
| 0.142 | - | 1.0 | - | - | - | - |

**Table 1**: Sample SST data that can be used to calculate a sample NASA SPoRT 7-day SST composite value. When using the data in the table, the NASA SPoRT 7-day SST composite value can be computed to be ~278.5 K (see Appendix A for the calculation).

**Appenxis A: SPoRT SST 7-day Composite Sample Value Calculation**

Using Eq. 1 and the sample SST data from Table 1, the SPoRT SST 7-day Composite value can be calculated as followed:

$$\sum_d (S * R * L) = \left((279.3\ K)(1.0)\left(\frac{1}{2}\right)\right) + \left((279.6\ K)(1.0)\left(\frac{1}{3}\right)\right) + \left((279.9\ K)(1.0)\left(\frac{1}{5}\right)\right) + \left((276.5\ K)(1.0)\left(\frac{1}{6}\right)\right) + \left((280.2\ K)(0.1)\left(\frac{1}{1}\right)\right) + \left((276.7\ K)(0.5)\left(\frac{1}{1}\right)\right) \approx 501.283\ K$$

$$\sum_d (R * L) = \left((1.0)\left(\frac{1}{2}\right)\right) + \left((1.0)\left(\frac{1}{3}\right)\right) + \left((1.0)\left(\frac{1}{5}\right)\right) + \left((1.0)\left(\frac{1}{6}\right)\right) + \left((0.1)\left(\frac{1}{1}\right)\right) + \left((0.5)\left(\frac{1}{1}\right)\right) = 1.8$$

$$SST_F = \frac{\sum_d (S * R * L)}{\sum_d (R * L)} = \frac{501.283\ K}{1.8} \approx 278.5\ K$$