Table 5: Calculations for Fish data

|  |  |  |
| --- | --- | --- |
| **Variable Name** | **Variable Description** | **Calculation** |
| Fish\_Abun | Total Abundance | Σ fish / unit of interest1 |
| Fish\_Biom | Fish Biomass (individuals) | αL*β*  L =measured fork length (cm)  α and β = coefficients for length-weight relationships of species2 |
| Fish\_Total\_Biom | Total Biomass | Σ Fish\_Biom / unit of interest1 |
| Fish\_TaxaR | Taxonomic Richness | Σ taxa / unit of interest1 |
| Fish\_Freq | Frequency of taxon occurrence (%) | Proportion of sampled sites in which fish of a given taxon is present / number of sites sampled |

1 units of interest may include site, fish taxon, fish family, and feeding guild

2Menza et al., 2006

Table 11: Calculations using SpGorg Data

|  |  |  |
| --- | --- | --- |
| **Variable Name** | **Variable Description** | **Calculation** |
| Spn\_n  Gorg\_n | Abundance | # colonies in a quadrat |
| Spn\_3DCSA  Gorg\_3DCSA | 3D surface area | Refer to SA estimations in Santavy et al. 2012 |
| Spn\_Den  Gorg\_Den | Density | Σ Spn\_n/area of transect  Σ Gorg\_n/area of transect |
| Spn\_TSA  Gorg\_TSA | Total Surface Area | Σ Spn\_CSA in a quadrat or transect area  Σ Gorg\_CSA in quadrat or transect area |
| Spn\_CSA\_Av  Gorg\_CSA\_Av | Average Surface Area | Σ Spn\_CSA in quadrat or transect area/Spn\_n  Σ Gorg\_CSA in quadrat or transect area/Gorg\_n |

Table 13: Common calculations for Stony Coral

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Variable Name** | **Variable Type** | | **Variable Description** | | **Units** | | **Calculation** | |
| **n** | Transect | | Number (abundance) | | colonies | | # coloniesin transect area | |
| **Den** | Transect | | Density | | # colonies/sq m | | Σ n ÷ transect area | |
| **Tx** | Transect | | Number of taxa (richness) | | # taxa/transect | | # unique taxa in the transect area | |
| **Tx\_Fr** | Region | | Frequency of occurrence for a taxon | | % of stations | | (# sites with a particular taxon ÷ number of sites in region) x 100 | |
|  |  | |  | |  | |  | |
| **CSA** | Colony | | Colony Surface Area | | m2 | | Mπr2 \*  r=(colony height + (colony diam/2)/2)  M=1, 2, 3, or 4 depending on morphology (see Morphfactors.xlsx) | |
| **CSA\_Av** | Transect | | Average Colony Surface Area | | m2 | | Σ CSA ÷ n | |
| **CSA\_SD** | Transect | | Standard Deviation of Colony Surface Area | | -- | | Standard deviation of CSA\_Av | |
| **CSA\_CV** | Transect | | Coefficient of Variation of Colony Surface Area | | -- | | (CSA\_SD ÷ CSA\_Av) x 100 | |
| **TSA** | Transect | | Total Surface Area | | m2 | | Σ CSA for all colonies in transect | |
| **3DTC** | Transect | | Total Cover | | m2 / m2 | | TSA ÷ area of transect | |
|  |  | |  | |  | |  | |
| **LT** | Colony | | Live Tissue (%) | | Percent | | Estimated % live tissue on a colony | |
| **LT\_Av** | Transect | | Average Live Tissue | | Percent | | Σ LT ÷ n | |
| **LCSA** | Colony | | Live Colony Surface Area | | m2 | | CSA x (LT ÷ 100) | |
| **LCSA\_Av** | Transect | | Average Live Colony Surface Area | | m2 | | Σ LCSA ÷ n | |
| **LSA** | Transect | | Total Live Surface Area | | m2 | | Σ LCSA for all colonies in transect | |
| **3DLC** | Transect | | Live Cover | | m2 / m2 | | LSA ÷ area of transect | |
|  |  | |  | |  | |  | |
|  |  | |  | |  | |  | |
|  | |  | |  | |  | |  |
|  | |  | |  | |  | |  |

Supplemental Table 1. Gorgonian morphological shapes and regression models to estimate surface area

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Gorgonian Morphology** | | **Simulated Model** | ***in situ* example** | **Surface Area Estimations** |
| Sea Fans | Planar  *Gorgonia ventalina, Leptogorgia* | seafan planar | SF planar | SA=0.68h2+0.66d2–3.61 |
|  | Three-dimensional  *Gorgonia flabellum* | sea fan 3d | SF 3D | SA=0.0113h3+106d–1190 |
| Sea Rods  branch and branchlet diameter ≥ 15 - ≤30mm | Unbranched  digitate form,  *Briareu* | sea rods unbranched | SR unbr | SA=0.341d3+11.2h–127 |
|  | Branched  *Plexaura* | sea rods branched | SRbr | SA=1.46d2+399 |
|  | Bushy  *Eunicea fusca* | sea rods bushy | SR bush | SA=0.0288h3+ 939 |
|  | Planar  *Eunicea tourneforti* | sea rods planar | SR planar | SA=76.4 d–806 |
| Sea Whips  branch & branchlet diameter ≥5 - ≤15mm | Branched  *Pterogorgia* | sea whips branched | SWbr2 | SA=-0.479h3+3.37h2-1.3h+354 |
|  | Bushy  *Pterogorgia guadalupensi* | sea whips bushy | SWbush | SA=0.0672d3+1610 |
| Sea Plumes  smallest branch & branchlet diameter usually ≤5mm | *Muriceopsis flavida, Pseudopterogorgia* | sea plums bushy | SP | SA=4.77h2–2990 |
| Encrusting Gorgonians | *Briareum,*  *Erythopodium* |  |  | SA=dw |