

APPENDIX I

DEMERSAL COMMUNITY ASSESSMENT FROM TRAWLS

Fish Catch Summary Tables and Metrics

Table I-1. Demersal Fish Abundances - RHMP 2013

| Scientific Name | Common Name | Dana Point Harbor | Oceanside Harbor | Mission Bay | | | San Diego Bay | | | | | | | | | | Total Abundance per Taxa | % of Total Abundance | Frequency of Trawl Capture (%) |
|------------------------------------|-------------------------|-------------------|------------------|-------------|-----------|------------|---------------|---------------|------------|---------------|------------|------------|------------|-----------|-----------|-----------|--------------------------|----------------------|--------------------------------|
| | | | | | | | North | North Central | | South Central | | | | South Bay | | | | | |
| | | | | | | | | | | 8078 | 8060 | 8058 | 8052 | 8029 | 8017 | 8020 | | | |
| 8263 | 8239 | 8159 | 8152 | 8156 | 8122 | 8118 | 8109 | 8078 | 8060 | 8058 | 8052 | 8029 | 8017 | 8020 | | | | | |
| Anchoa compressa | Deepbody Anchovy | | | 8 | | | | | | 29 | 82 | 174 | | 13 | 16 | 322 | 15.1 | 40 | |
| Anchoa delicatissima | Slough Anchovy | | | 409 | | | | | | 50 | 52 | 154 | | 7 | 28 | 700 | 32.8 | 40 | |
| Anisotremus davidsonii | Sargo | | | | | | | | | | | | | 4 | | 4 | 0.2 | 7 | |
| Atherinops affinis | Topsmelt | | | | | 3 | | | | | | | | | | 3 | 0.1 | 7 | |
| Atractoscion nobilis | White Seabass | | 1 | | | | | 1 | 1 | | | | | | | 3 | 0.1 | 20 | |
| Cheilotrema saturnum | Black Croaker | | | | | | 1 | | | 3 | 1 | | | | 1 | 6 | 0.3 | 27 | |
| Citharichthys stigmæus | Speckled Sanddab | | | | 2 | | | | | | | | | | | 2 | 0.1 | 7 | |
| Cymatogaster aggregata | Shiner Surfperch | 1 | | | | 8 | | | | | | 2 | 1 | | | 12 | 0.6 | 27 | |
| Embiotoca jacksoni | Black Surfperch | | | | | 26 | | | | | | | | | | 26 | 1.2 | 7 | |
| Gymnura marmorata | Butterfly Ray | | | 4 | | | | 1 | 1 | | | | | | | 6 | 0.3 | 20 | |
| Heterostichus rostratus | Giant Kelpfish | 1 | 2 | | | 16 | | | | | | | | | | 19 | 0.9 | 20 | |
| Micrometrus minimus | Dwarf Surfperch | | | | | 5 | | | | | | | | | | 5 | 0.2 | 7 | |
| Mustelus californicus | Gray Smoothhound | | | 2 | | | | 1 | 1 | | 1 | 3 | 3 | | | 11 | 0.5 | 40 | |
| Myliobatis californica | Bat Ray | 1 | | | | | | 1 | 1 | | 1 | | | | | 4 | 0.2 | 27 | |
| Paralabrax clathratus | Kelp Bass | 1 | | | | 23 | | | | | | | | | | 24 | 1.1 | 13 | |
| Paralabrax maculatofasciatus | Spotted Sand Bass | | | | | 9 | 4 | 4 | 11 | 24 | 4 | 2 | 4 | 1 | 3 | 66 | 3.1 | 67 | |
| Paralabrax nebulifer | Barred Sand Bass | 2 | 2 | | | 14 | 12 | 17 | 2 | 2 | 6 | 3 | 4 | 1 | 4 | 73 | 3.4 | 87 | |
| Paralichthys californicus | California Halibut | 5 | 1 | 1 | 1 | 2 | 7 | 10 | 7 | 6 | 3 | 3 | 2 | 2 | 1 | 51 | 2.4 | 93 | |
| Phanerodon furcatus | White Surfperch | 1 | 5 | | | 13 | | | | | | | | | | 19 | 0.9 | 20 | |
| Pleuronichthys guttulatus | Diamond Turbot | 1 | | | | 1 | 1 | | 1 | 2 | | | 1 | | | 7 | 0.3 | 40 | |
| Pleuronichthys ritteri | Spotted Turbot | | | | 1 | | | 1 | 8 | 2 | | | | | | 12 | 0.6 | 27 | |
| Porichthys myriaster | Specklefin Midshipman | | | | | | | | 5 | 2 | 1 | | | | | 8 | 0.4 | 20 | |
| Quietula y-cauda | Shadow Goby | | | 1 | | | | | | | | | | | | 1 | 0.0 | 7 | |
| Rhinobatos productus | Shovelnose Guitarfish | | | | | | | | 1 | | | | | | | 1 | 0.0 | 7 | |
| Roncador stearnsii | Spotfin Croaker | 1 | 4 | | | | | | | | | | | | | 5 | 0.2 | 13 | |
| Scorpaena guttata | California Scorpionfish | | | | 2 | | | | | | | | | | | 2 | 0.1 | 7 | |
| Seriphus politus | Queenfish | | 16 | | | | | | | | 60 | 122 | 139 | | | 337 | 15.8 | 27 | |
| Syngnathus leptorhynchus | Bay Pipefish | | | | | 2 | | | | | | | | | | 2 | 0.1 | 7 | |
| Symphurus atricaudus | California Tonguefish | | 3 | | | | | 6 | 15 | 5 | | 1 | | | | 30 | 1.4 | 33 | |
| Synodus lucioceps | California Lizardfish | 6 | 13 | | 14 | | | 71 | 75 | 8 | | | | | | 187 | 8.8 | 40 | |
| Umbrina roncadior | Yellowfin Croaker | | | 1 | | | | 1 | | | | 1 | | | | 3 | 0.1 | 20 | |
| Urobatis halleri | Round Stingray | | 1 | 1 | | 5 | 1 | 6 | 54 | 4 | 45 | 23 | 35 | 2 | 5 | 182 | 8.5 | 80 | |
| Xystreurus liolepis | Fantail Sole | | | | | | | | 1 | | | | | | | 1 | 0.0 | 7 | |
| Total Abundance per Station | | 20 | 48 | 427 | 20 | 127 | 26 | 120 | 184 | 58 | 201 | 294 | 517 | 6 | 37 | 49 | 2134 | | |
| Means | | 20 | 48 | 191 | | | 149 | | | | | | | | | | | | |

Table I-2. Demersal Fish Biomass (kg) - RHMP 2013

| Scientific Name | Common Name | Dana Point Harbor | Oceanside Harbor | Mission Bay | | | San Diego Bay | | | | | | | | | | Total Biomass per Taxa | % of Total Biomass | | |
|----------------------------------|-------------------------|-------------------|------------------|-------------|-------------|--------------|---------------|-------------|---------------|-------------|-------------|---------------|-------------|-------------|-------------|-------------|------------------------|--------------------|--|--|
| | | | | | | | North | | North Central | | | South Central | | | | South Bay | | | | |
| | | | | | | | 8122 | 8118 | 8109 | 8078 | 8060 | 8058 | 8052 | 8029 | 8017 | 8020 | | | | |
| Anchoa compressa | Deepbody Anchovy | | | <0.1 | | | | | | 0.11 | 0.32 | 0.53 | | <0.1 | <0.1 | 1.30 | 0.9 | | | |
| Anchoa delicatissima | Slough Anchovy | | | <0.1 | | | | | | <0.1 | <0.1 | <0.1 | | <0.1 | <0.1 | 0.60 | 0.4 | | | |
| Anisotremus davidsonii | Sargo | | | | | | | | | | | | | 1.08 | | 1.08 | 0.8 | | | |
| Atherinops affinis | Topsmelt | | | | | <0.1 | | | | | | | | | | 0.10 | 0.1 | | | |
| Atractoscion nobilis | White Seabass | | <0.1 | | | | | 0.11 | 0.14 | | | | | | | 0.40 | 0.3 | | | |
| Cheilotrema saturnum | Black Croaker | | | | | | 0.15 | | | 0.45 | 0.29 | | | 0.11 | | 1.00 | 0.7 | | | |
| Citharichthys stigmaeus | Speckled Sanddab | | | | <0.1 | | | | | | | | | | | 0.10 | 0.1 | | | |
| Cymatogaster aggregata | Shiner Surfperch | <0.1 | | | | <0.1 | | | | | | <0.1 | <0.1 | | | 0.40 | 0.3 | | | |
| Embiotoca jacksoni | Black Surfperch | | | | | 2.38 | | | | | | | | | | 2.38 | 1.7 | | | |
| Gymnura marmorata | Butterfly Ray | | | 1.13 | | | | 0.23 | 0.80 | | | | | | | 2.16 | 1.5 | | | |
| Heterostichus rostratus | Giant Kelpfish | <0.1 | <0.1 | | | <0.1 | | | | | | | | | | 0.30 | 0.2 | | | |
| Micrometrus minimus | Dwarf Surfperch | | | | | <0.1 | | | | | | | | | | 0.10 | 0.1 | | | |
| Mustelus californicus | Gray Smoothhound | | | 0.18 | | | | 0.68 | 0.65 | | 0.14 | 0.39 | 0.43 | | | 2.47 | 1.7 | | | |
| Myliobatis californica | Bat Ray | 0.63 | | | | | | 8.60 | 1.85 | | 0.95 | | | | | 12.03 | 8.5 | | | |
| Paralabrax clathratus | Kelp Bass | <0.1 | | | | 1.2 | | | | | | | | | | 1.30 | 0.9 | | | |
| Paralabrax maculatofasciatus | Spotted Sand Bass | | | | | 4.38 | 1.13 | 0.81 | 1.83 | 4.48 | 0.72 | 0.39 | 0.63 | 0.21 | 0.64 | 19.58 | 13.9 | | | |
| Paralabrax nebulifer | Barred Sand Bass | <0.1 | <0.1 | | | 0.73 | 0.72 | 1.18 | 0.17 | 0.15 | 0.28 | 0.13 | 0.15 | <0.1 | 0.15 | 0.13 | 4.03 | 2.9 | | |
| Paralichthys californicus | California Halibut | 0.68 | 1.20 | <0.1 | <0.1 | <0.1 | 0.36 | 1.23 | 1.68 | 1.73 | 0.42 | 0.25 | <0.1 | 0.14 | | <0.1 | 8.20 | 5.8 | | |
| Phanerodon furcatus | White Surfperch | <0.1 | 0.43 | | | 0.40 | | | | | | | | | | 0.90 | 0.6 | | | |
| Pleuronichthys guttulatus | Diamond Turbot | 0.21 | | | | <0.1 | 0.20 | | 0.27 | 0.49 | | | 0.45 | | | 1.71 | 1.2 | | | |
| Pleuronichthys ritteri | Spotted Turbot | | | | <0.1 | | | 0.11 | 0.67 | 0.12 | | | | | | 1.00 | 0.7 | | | |
| Porichthys myriaster | Specklefin Midshipman | | | | | | | | 0.21 | <0.1 | <0.1 | | | | | 0.40 | 0.3 | | | |
| Quietula y-cauda | Shadow Goby | | | <0.1 | | | | | | | | | | | | 0.10 | 0.1 | | | |
| Rhinobatos productus | Shovelnose Guitarfish | | | | | | | | 1.97 | | | | | | | 1.97 | 1.4 | | | |
| Roncador stearnsii | Spotfin Croaker | 0.25 | 0.68 | | | | | | | | | | | | | 0.93 | 0.7 | | | |
| Scorpaena guttata | California Scorpionfish | | | | <0.1 | | | | | | | | | | | 0.10 | 0.1 | | | |
| Seriphus politus | Queenfish | | <0.1 | | | | | | | | 0.31 | 0.65 | 0.51 | | | 1.60 | 1.1 | | | |
| Syngnathus leptorhynchus | Bay Pipefish | | | | | <0.1 | | | | | | | | | | 0.10 | 0.1 | | | |
| Symphurus atricaudus | California Tonguefish | | <0.1 | | | | | 0.55 | 0.15 | <0.1 | | <0.1 | | | | 1.00 | 0.7 | | | |
| Synodus lucioceps | California Lizardfish | <0.1 | 0.58 | | 0.20 | | | 1.73 | 1.98 | 0.14 | | | | | | 4.70 | 3.3 | | | |
| Umbrina roncadore | Yellowfin Croaker | | | <0.1 | | | | 0.46 | | | 0.35 | | | | | 0.90 | 0.6 | | | |
| Urobatis halleri | Round Stingray | | 0.40 | 0.24 | | 1.68 | 0.37 | 1.28 | 12.16 | 0.68 | 12.29 | 4.96 | 32.74 | 0.35 | 1.00 | 68.15 | 48.2 | | | |
| Xystreureys liolepis | Fantail Sole | | | | | | | | 0.29 | | | | | | | 0.29 | 0.2 | | | |
| Total Biomass per Station | | 2.40 | 3.80 | 2.10 | 0.60 | 11.45 | 2.92 | 17.0 | 24.8 | 8.40 | 15.7 | 7.70 | 35.7 | 0.80 | 3.20 | 0.40 | 141 | | | |
| Means | | 2.40 | 3.80 | 4.72 | | | 11.7 | | | | | | | | | | | | | |

Table I-3. Demersal Fish Biodiversity Metrics - RHMP 2013

| Biological Metric | Dana Point Harbor | Oceanside Harbor | Mission Bay | | | San Diego Bay | | | | | | | | | |
|--------------------------------|-------------------|------------------|-------------|------|------|---------------|---------------|------|---------------|------|------|------|-----------|------|------|
| | | | | | | North | North Central | | South Central | | | | South Bay | | |
| | 8263 | 8239 | 8159 | 8152 | 8156 | 8122 | 8118 | 8109 | 8078 | 8060 | 8058 | 8052 | 8029 | 8017 | 8020 |
| Taxa Richness | 10.0 | 10.0 | 8.0 | 5.0 | 13.0 | 6.0 | 12.0 | 15.0 | 10.0 | 11.0 | 11.0 | 10.0 | 4.0 | 7.0 | 4.0 |
| Abundance | 20.0 | 48.0 | 427 | 20.0 | 127 | 26.0 | 120 | 184 | 58.0 | 201 | 294 | 517 | 6.0 | 37.0 | 49.0 |
| Shannon-Wiener Diversity Index | 1.99 | 1.84 | 0.24 | 1.01 | 2.25 | 1.37 | 1.45 | 1.70 | 1.89 | 1.67 | 1.47 | 1.41 | 1.33 | 1.74 | 0.97 |
| Pielou's Evenness Index | 0.86 | 0.80 | 0.12 | 0.63 | 0.88 | 0.77 | 0.58 | 0.63 | 0.82 | 0.70 | 0.61 | 0.61 | 0.96 | 0.89 | 0.70 |
| % Dominance Top Taxa | 30.0 | 34.8 | 95.8 | 70.0 | 20.5 | 46.2 | 59.2 | 40.8 | 41.4 | 14.4 | 41.5 | 33.7 | 33.3 | 35.1 | 57.1 |
| % Dominance Top 3 Taxa | 65.0 | 73.9 | 98.6 | 90.0 | 51.2 | 88.5 | 81.7 | 78.3 | 65.5 | 69.2 | 87.1 | 90.3 | 83.3 | 67.6 | 98.0 |
| % Biomass Top Taxa | 28.1 | 31.6 | 53.8 | 32.5 | 38.3 | 38.8 | 50.7 | 49.0 | 53.3 | 78.3 | 64.4 | 91.7 | 43.1 | 33.8 | 31.3 |
| % Biomass Top 3 Taxa | 64.6 | 64.5 | 73.8 | 32.5 | 73.7 | 76.0 | 68.5 | 64.9 | 82.0 | 88.9 | 77.9 | 94.9 | 85.6 | 84.8 | 31.3 |
| % Top Predator Taxa | 40.0 | 30.0 | 12.5 | 40.0 | 30.8 | 50.0 | 41.7 | 33.3 | 40.0 | 27.3 | 27.3 | 30.0 | 75.0 | 28.6 | 50.0 |
| % Top Predator Individuals | 70.0 | 33.3 | 0.2 | 75.0 | 37.8 | 88.5 | 85.8 | 52.2 | 69.0 | 6.5 | 2.7 | 1.9 | 66.7 | 18.9 | 10.2 |

Table I-4. Demersal Fish Ecological Indices, All Harbors Combined - RHMP 2013

| Scientific Name | Common Name | % of Total Abundance | Frequency of Trawl Capture (%) | % of Total Biomass | ECOLOGICAL INDEX |
|-------------------------------------|-------------------------|----------------------|--------------------------------|--------------------|------------------|
| <i>Urobatis halleri</i> | Round Stingray | 8.5 | 80 | 49.4 | 4636 |
| <i>Anchoa delicatissima</i> | Slough Anchovy | 32.8 | 40 | 0.1 | 1315 |
| <i>Paralabrax maculatofasciatus</i> | Spotted Sand Bass | 3.1 | 67 | 14.2 | 1153 |
| <i>Paralichthys californicus</i> | California Halibut | 2.4 | 93 | 5.6 | 742 |
| <i>Anchoa compressa</i> | Deepbody Anchovy | 15.1 | 40 | 0.7 | 631 |
| <i>Paralabrax nebulifer</i> | Barred Sand Bass | 3.4 | 87 | 2.7 | 533 |
| <i>Synodus lucioceps</i> | California Lizardfish | 8.8 | 40 | 3.4 | 485 |
| <i>Seriphus politus</i> | Queenfish | 15.8 | 27 | 1.1 | 449 |
| <i>Myliobatis californica</i> | Bat Ray | 0.2 | 27 | 8.7 | 238 |
| <i>Mustelus californicus</i> | Gray Smoothound | 0.5 | 40 | 1.8 | 92.1 |
| <i>Symphurus atricaudus</i> | California Tonguefish | 1.4 | 33 | 0.5 | 63.7 |
| <i>Pleuronichthys guttulatus</i> | Diamond Turbot | 0.3 | 40 | 1.2 | 59.8 |
| <i>Gymnura marmorata</i> | Butterfly Ray | 0.3 | 20 | 1.6 | 37.0 |
| <i>Pleuronichthys ritteri</i> | Spotted Turbot | 0.6 | 27 | 0.7 | 32.4 |
| <i>Phanerodon furcatus</i> | White Surfperch | 0.9 | 20 | 0.6 | 29.8 |
| <i>Cheilotrema saturnum</i> | Black Croaker | 0.3 | 27 | 0.7 | 26.7 |
| <i>Paralabrax clathratus</i> | Kelp Bass | 1.1 | 13 | 0.9 | 26.6 |
| <i>Embiotoca jacksoni</i> | Black Surfperch | 1.2 | 6.7 | 1.7 | 19.6 |
| <i>Heterostichus rostratus</i> | Giant Kelpfish | 0.9 | 20 | 0.1 | 19.3 |
| <i>Cymatogaster aggregata</i> | Shiner Surfperch | 0.6 | 27 | 0.1 | 16.9 |
| <i>Umbrina roncadior</i> | Yellowfin Croaker | 0.1 | 20 | 0.6 | 14.5 |
| <i>Roncadior stearnsii</i> | Spotfin Croaker | 0.2 | 13 | 0.7 | 12.1 |
| <i>Porichthys myriaster</i> | Specklefin Midshipman | 0.4 | 20 | 0.2 | 10.5 |
| <i>Rhinobatos productus</i> | Shovelnose Guitarfish | 0.0 | 6.7 | 1.4 | 9.84 |
| <i>Anisotremus davidsonii</i> | Sargo | 0.2 | 6.7 | 0.8 | 6.47 |
| <i>Atractoscion nobilis</i> | White Seabass | 0.1 | 20 | 0.2 | 6.44 |
| <i>Micrometrus minimus</i> | Dwarf Surfperch | 0.2 | 6.7 | 0.1 | 2.05 |
| <i>Xystreurys liolepis</i> | Fantail Sole | 0.0 | 6.7 | 0.2 | 1.69 |
| <i>Atherinops affinis</i> | Topsmelt | 0.1 | 6.7 | 0.1 | 1.42 |
| <i>Citharichthys stigmaeus</i> | Speckled Sanddab | 0.1 | 6.7 | 0.1 | 1.11 |
| <i>Scorpaena guttata</i> | California Scorpionfish | 0.1 | 6.7 | 0.1 | 1.11 |
| <i>Syngnathus leptorhynchus</i> | Bay Pipefish | 0.1 | 6.7 | 0.1 | 1.11 |
| <i>Quietula y-cauda</i> | Shadow Goby | 0.0 | 6.7 | 0.1 | 0.80 |

Table I-5. Demersal Fish Ecological Indices, Sorted By Harbor - RHMP 2013

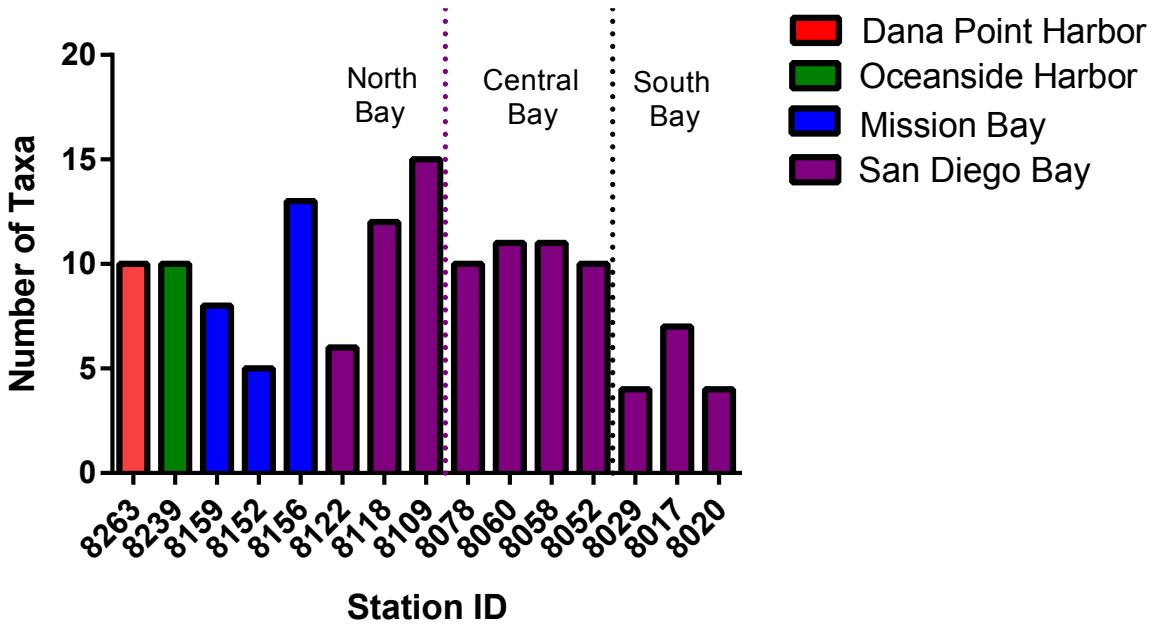
| Harbor | Common Name | Scientific Name | % of Total Abundance | Frequency of Trawl Capture (%) | % of Total Biomass | ECOLOGICAL INDEX |
|-----------------------|-------------------------|-------------------------------------|----------------------|--------------------------------|--------------------|------------------|
| Dana Point | California Halibut | <i>Paralichthys californicus</i> | 25.0 | 100 | 28.6 | 5360 |
| Dana Point | California Lizardfish | <i>Synodus lucioceps</i> | 30.0 | 100 | 4.2 | 3424 |
| Dana Point | Bat Ray | <i>Myliobatis californica</i> | 5.0 | 100 | 26.5 | 3148 |
| Dana Point | Spotfin Croaker | <i>Roncador stearnsii</i> | 5.0 | 100 | 10.6 | 1559 |
| Dana Point | Barred Sand Bass | <i>Paralabrax nebulifer</i> | 10.0 | 100 | 4.2 | 1424 |
| Dana Point | Diamond Turbot | <i>Pleuronichthys guttulatus</i> | 5.0 | 100 | 8.9 | 1390 |
| Dana Point | Shiner Surfperch | <i>Cymatogaster aggregata</i> | 5.0 | 100 | 4.2 | 924 |
| Dana Point | Giant Kelpfish | <i>Heterostichus rostratus</i> | 5.0 | 100 | 4.2 | 924 |
| Dana Point | Kelp Bass | <i>Paralabrax clathratus</i> | 5.0 | 100 | 4.2 | 924 |
| Dana Point | White Surfperch | <i>Phanerodon furcatus</i> | 5.0 | 100 | 4.2 | 924 |
| Oceanside | California Lizardfish | <i>Synodus lucioceps</i> | 27.1 | 100 | 15.2 | 4232 |
| Oceanside | Queenfish | <i>Seriphus politus</i> | 33.3 | 100 | 2.6 | 3598 |
| Oceanside | California Halibut | <i>Paralichthys californicus</i> | 2.1 | 100 | 31.8 | 3387 |
| Oceanside | Spotfin Croaker | <i>Roncador stearnsii</i> | 8.3 | 100 | 17.9 | 2621 |
| Oceanside | White Surfperch | <i>Phanerodon furcatus</i> | 10.4 | 100 | 11.3 | 2167 |
| Oceanside | Round Stingray | <i>Urobatis halleri</i> | 2.1 | 100 | 10.6 | 1268 |
| Oceanside | California Tonguefish | <i>Symphurus atricaudus</i> | 6.3 | 100 | 2.6 | 890 |
| Oceanside | Giant Kelpfish | <i>Heterostichus rostratus</i> | 4.2 | 100 | 2.6 | 682 |
| Oceanside | Barred Sand Bass | <i>Paralabrax nebulifer</i> | 4.2 | 100 | 2.6 | 682 |
| Oceanside | White Seabass | <i>Atractoscion nobilis</i> | 2.1 | 100 | 2.6 | 473 |
| Mission Bay | Slough Anchovy | <i>Anchoa delicatissima</i> | 71.3 | 33.3 | 0.7 | 2399 |
| Mission Bay | Spotted Sand Bass | <i>Paralabrax maculatofasciatus</i> | 1.6 | 33.3 | 31.5 | 1103 |
| Mission Bay | Round Stingray | <i>Urobatis halleri</i> | 1.0 | 66.7 | 13.8 | 991 |
| Mission Bay | Black Surfperch | <i>Embiotoca jacksoni</i> | 4.5 | 33.3 | 17.1 | 722 |
| Mission Bay | Kelp Bass | <i>Paralabrax clathratus</i> | 4.0 | 33.3 | 8.5 | 417 |
| Mission Bay | Butterfly Ray | <i>Gymnura marmorata</i> | 0.7 | 33.3 | 8.1 | 294 |
| Mission Bay | Barred Sand Bass | <i>Paralabrax nebulifer</i> | 2.4 | 33.3 | 5.3 | 256 |
| Mission Bay | White Surfperch | <i>Phanerodon furcatus</i> | 2.3 | 33.3 | 2.9 | 172 |
| Mission Bay | California Halibut | <i>Paralichthys californicus</i> | 0.7 | 100 | 0.7 | 142 |
| Mission Bay | California Lizardfish | <i>Synodus lucioceps</i> | 2.4 | 33.3 | 1.4 | 128 |
| Mission Bay | Giant Kelpfish | <i>Heterostichus rostratus</i> | 2.8 | 33.3 | 0.7 | 117 |
| Mission Bay | Deepbody Anchovy | <i>Anchoa compressa</i> | 1.4 | 33.3 | 0.7 | 70 |
| Mission Bay | Shiner Surfperch | <i>Cymatogaster aggregata</i> | 1.4 | 33.3 | 0.7 | 70 |
| Mission Bay | Gray Smoothhound | <i>Mustelus californicus</i> | 0.3 | 33.3 | 1.3 | 55 |
| Mission Bay | Dwarf Surfperch | <i>Micrometrus minimus</i> | 0.9 | 33.3 | 0.7 | 53 |
| Mission Bay | Topsmelt | <i>Atherinops affinis</i> | 0.5 | 33.3 | 0.7 | 41 |
| Mission Bay | Speckled Sanddab | <i>Citharichthys stigmaeus</i> | 0.3 | 33.3 | 0.7 | 36 |
| Mission Bay | California Scorpionfish | <i>Scorpaena guttata</i> | 0.3 | 33.3 | 0.7 | 36 |
| Mission Bay | Bay Pipefish | <i>Syngnathus sp</i> | 0.3 | 33.3 | 0.7 | 36 |
| Mission Bay | Diamond Turbot | <i>Pleuronichthys guttulatus</i> | 0.2 | 33.3 | 0.7 | 30 |
| Mission Bay | Spotted Turbot | <i>Pleuronichthys ritteri</i> | 0.2 | 33.3 | 0.7 | 30 |
| Mission Bay | Shadow Goby | <i>Quietula y-cauda</i> | 0.2 | 33.3 | 0.7 | 30 |
| Mission Bay | Yellowfin Croaker | <i>Umbrina roncadior</i> | 0.2 | 33 | 0.7 | 30 |
| San Diego Bay North | Round Stingray | <i>Urobatis halleri</i> | 18.5 | 100.0 | 30.9 | 4940 |
| San Diego Bay North | California Lizardfish | <i>Synodus lucioceps</i> | 44.2 | 66.7 | 8.3 | 3503 |
| San Diego Bay North | Bat Ray | <i>Myliobatis californica</i> | 0.6 | 66.7 | 23.4 | 1600 |
| San Diego Bay North | California Halibut | <i>Paralichthys californicus</i> | 7.3 | 100.0 | 7.3 | 1458 |
| San Diego Bay North | Spotted Sand Bass | <i>Paralabrax maculatofasciatus</i> | 5.8 | 100.0 | 8.4 | 1419 |
| San Diego Bay North | Barred Sand Bass | <i>Paralabrax nebulifer</i> | 9.4 | 100.0 | 4.6 | 1402 |
| San Diego Bay North | California Tonguefish | <i>Symphurus atricaudus</i> | 6.4 | 66.7 | 1.6 | 528 |
| San Diego Bay North | Spotted Turbot | <i>Pleuronichthys ritteri</i> | 2.7 | 67 | 1.7 | 297 |
| San Diego Bay North | Gray Smoothhound | <i>Mustelus californicus</i> | 0.6 | 66.7 | 3.0 | 239 |
| San Diego Bay North | Butterfly Ray | <i>Gymnura marmorata</i> | 0.6 | 66.7 | 2.3 | 194 |
| San Diego Bay North | Shovelnose Guitarfish | <i>Rhinobatos productus</i> | 0.3 | 33.3 | 4.4 | 157 |
| San Diego Bay North | Diamond Turbot | <i>Pleuronichthys guttulatus</i> | 0.6 | 66.7 | 1.0 | 110 |
| San Diego Bay North | White Seabass | <i>Atractoscion nobilis</i> | 0.6 | 66.7 | 0.6 | 78 |
| San Diego Bay North | Specklefin Midshipman | <i>Porichthys myriaster</i> | 1.5 | 33.3 | 0.5 | 66 |
| San Diego Bay North | Yellowfin Croaker | <i>Umbrina roncadior</i> | 0.3 | 33.3 | 1.0 | 44 |
| San Diego Bay North | Fantail Sole | <i>Xystreurus liolepis</i> | 0.3 | 33.3 | 0.6 | 31 |
| San Diego Bay North | Black Croaker | <i>Cheilotrema saturnum</i> | 0.3 | 33 | 0.3 | 21 |
| San Diego Bay Central | Round Stingray | <i>Urobatis halleri</i> | 10.0 | 100.0 | 75.1 | 8507 |
| San Diego Bay Central | Queenfish | <i>Seriphus politus</i> | 30.0 | 75.0 | 2.2 | 2412 |
| San Diego Bay Central | Deepbody Anchovy | <i>Anchoa compressa</i> | 26.6 | 75.0 | 1.4 | 2104 |
| San Diego Bay Central | Slough Anchovy | <i>Anchoa delicatissima</i> | 23.9 | 75 | 0.4 | 1828 |
| San Diego Bay Central | Spotted Sand Bass | <i>Paralabrax maculatofasciatus</i> | 3.2 | 100.0 | 9.2 | 1238 |
| San Diego Bay Central | California Halibut | <i>Paralichthys californicus</i> | 1.3 | 100.0 | 3.7 | 500 |
| San Diego Bay Central | Barred Sand Bass | <i>Paralabrax nebulifer</i> | 1.4 | 100.0 | 1.0 | 245 |
| San Diego Bay Central | Gray Smoothhound | <i>Mustelus californicus</i> | 0.7 | 75.0 | 1.4 | 155 |
| San Diego Bay Central | Diamond Turbot | <i>Pleuronichthys guttulatus</i> | 0.3 | 50.0 | 1.4 | 83 |
| San Diego Bay Central | Black Croaker | <i>Cheilotrema saturnum</i> | 0.4 | 50.0 | 1.1 | 73 |

Table I-5. Demersal Fish Ecological Indices, Sorted By Harbor - RHMP 2013

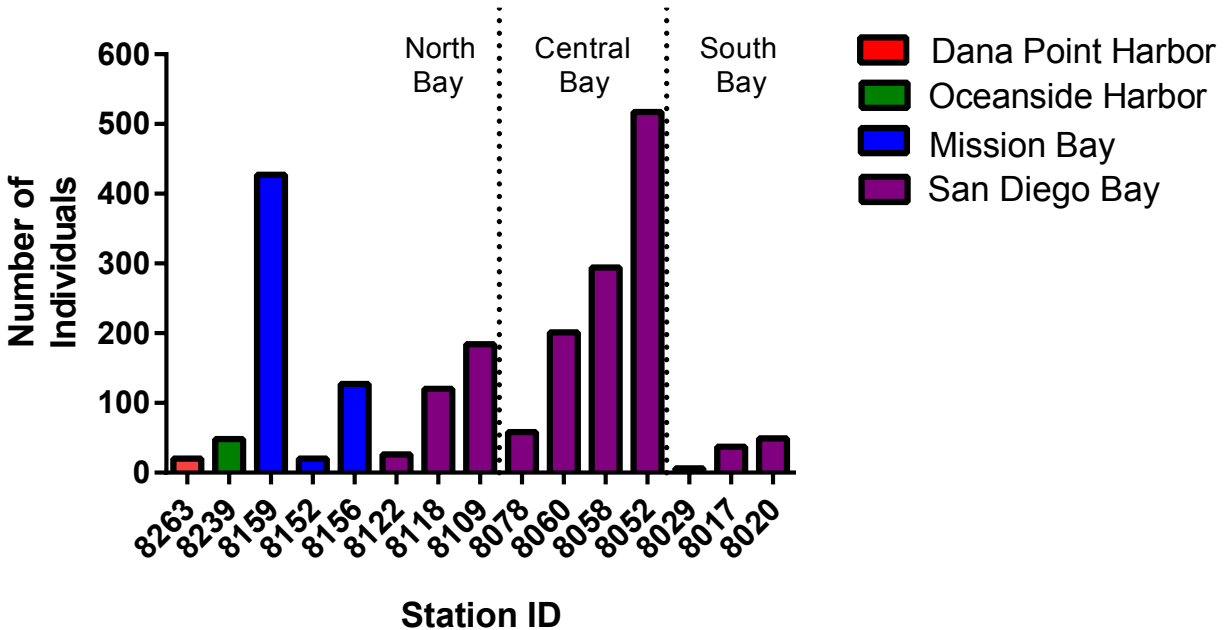
| Harbor | Common Name | Scientific Name | % of Total Abundance | Frequency of Trawl Capture (%) | % of Total Biomass | ECOLOGICAL INDEX |
|-----------------------|-----------------------|-------------------------------------|----------------------|--------------------------------|--------------------|------------------|
| San Diego Bay Central | California Tonguefish | <i>Symphurus atricaudus</i> | 0.6 | 50.0 | 0.3 | 43 |
| San Diego Bay Central | Bat Ray | <i>Myliobatis californica</i> | 0.1 | 25.0 | 1.4 | 38 |
| San Diego Bay Central | Shiner Surfperch | <i>Cymatogaster aggregata</i> | 0.3 | 50.0 | 0.3 | 29 |
| San Diego Bay Central | Specklefin Midshipman | <i>Porichthys myriaster</i> | 0.3 | 50.0 | 0.3 | 29 |
| San Diego Bay Central | California Lizardfish | <i>Synodus lucioceps</i> | 0.7 | 25.0 | 0.2 | 24 |
| San Diego Bay Central | Yellowfin Croaker | <i>Umbrina roncadore</i> | 0.1 | 25.0 | 0.5 | 15 |
| San Diego Bay Central | Spotted Turbot | <i>Pleuronichthys ritteri</i> | 0.2 | 25 | 0.2 | 9 |
| San Diego Bay South | Slough Anchovy | <i>Anchoa delicatissima</i> | 38.0 | 66.7 | 4.5 | 2839 |
| San Diego Bay South | Round Stingray | <i>Urobatis halleri</i> | 7.6 | 66.7 | 30.6 | 2545 |
| San Diego Bay South | Deepbody Anchovy | <i>Anchoa compressa</i> | 31.5 | 66.7 | 4.5 | 2404 |
| San Diego Bay South | Barred Sand Bass | <i>Paralabrax nebulifer</i> | 9.8 | 100.0 | 8.4 | 1819 |
| San Diego Bay South | Spotted Sand Bass | <i>Paralabrax maculatofasciatus</i> | 4.3 | 66.7 | 19.1 | 1563 |
| San Diego Bay South | Sargo | <i>Anisotremus davidsonii</i> | 4.3 | 33.3 | 24.5 | 963 |
| San Diego Bay South | California Halibut | <i>Paralichthys californicus</i> | 3.3 | 66.7 | 5.3 | 573 |
| San Diego Bay South | Black Croaker | <i>Cheilotrema saturnum</i> | 1.1 | 33 | 2.5 | 120 |

Fish Metric Graphical Summaries

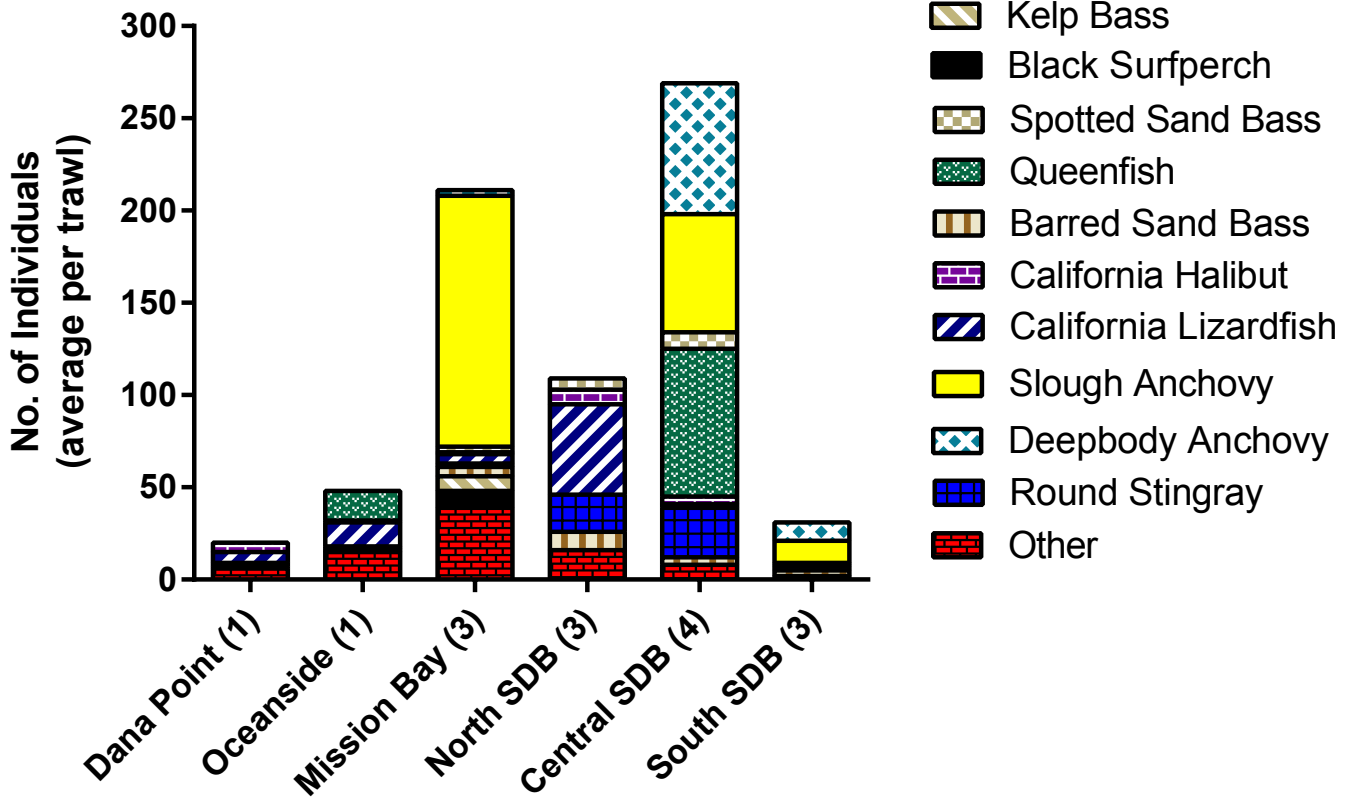
Fish Taxa Richness by Site RHMP 2013



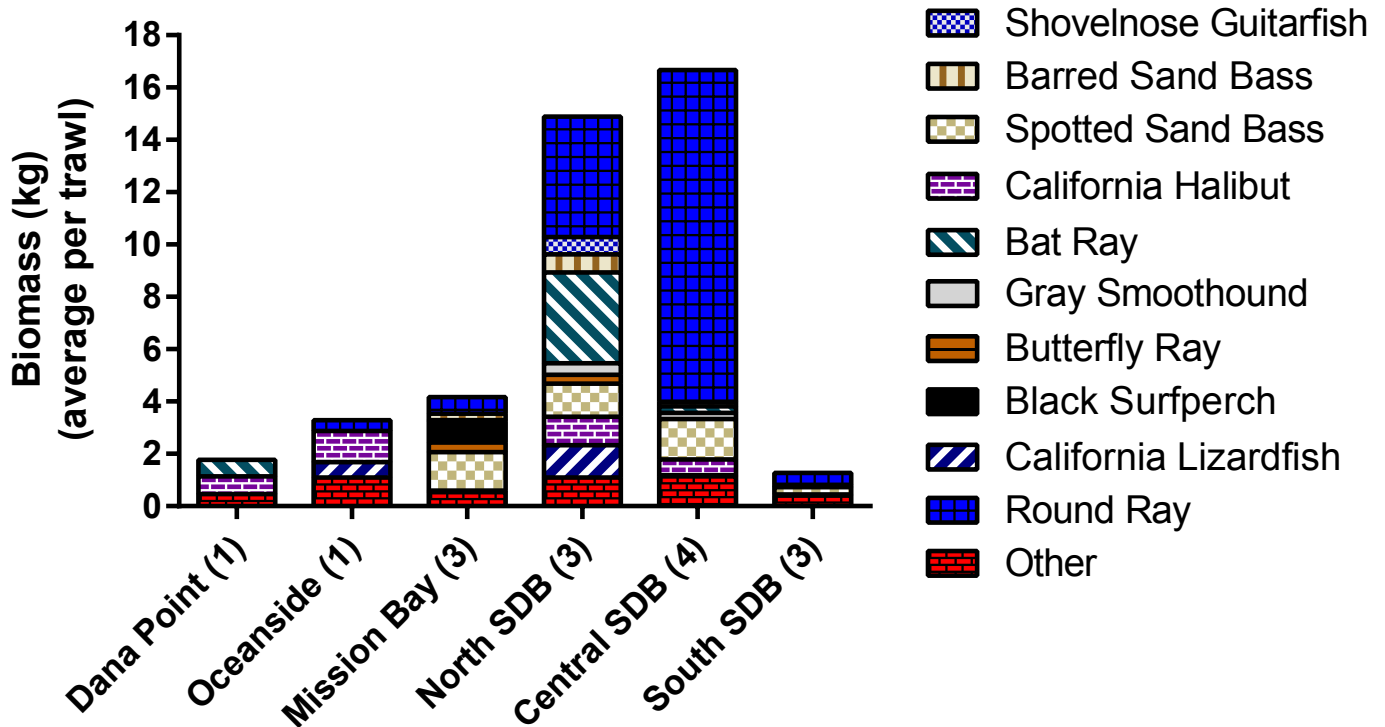
Fish Species Abundance by Site RHMP 2013



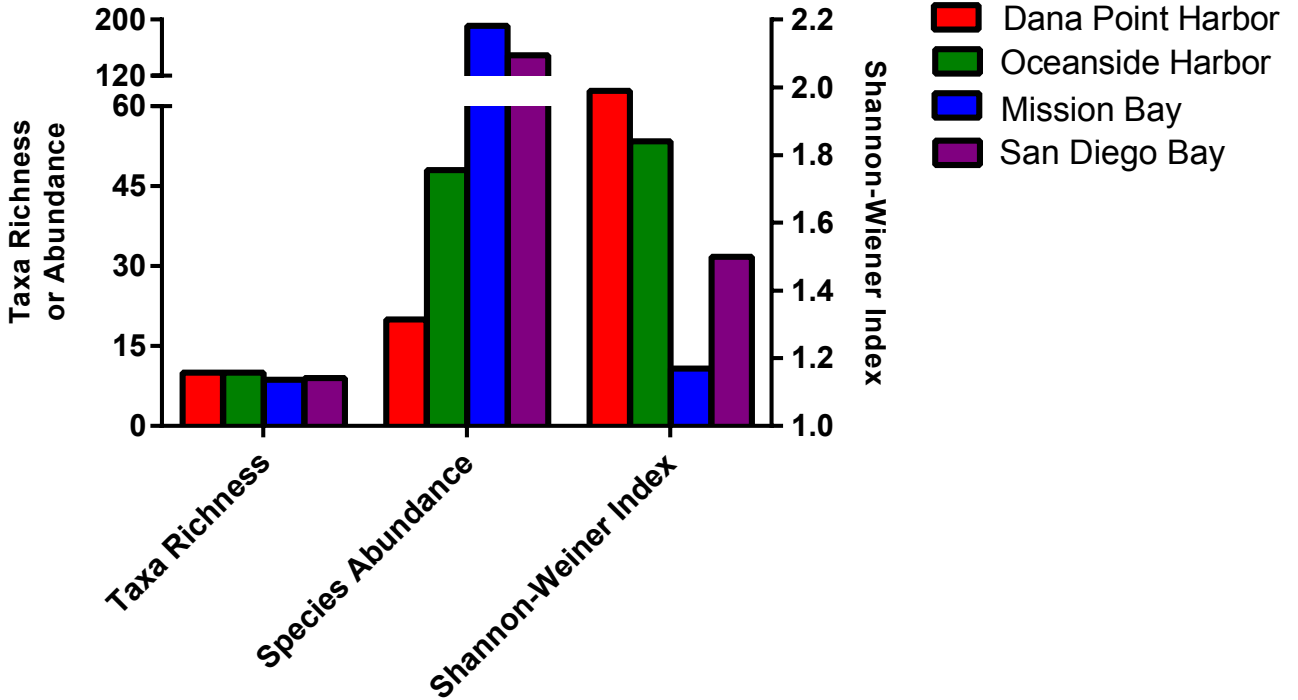
Fish Abundance



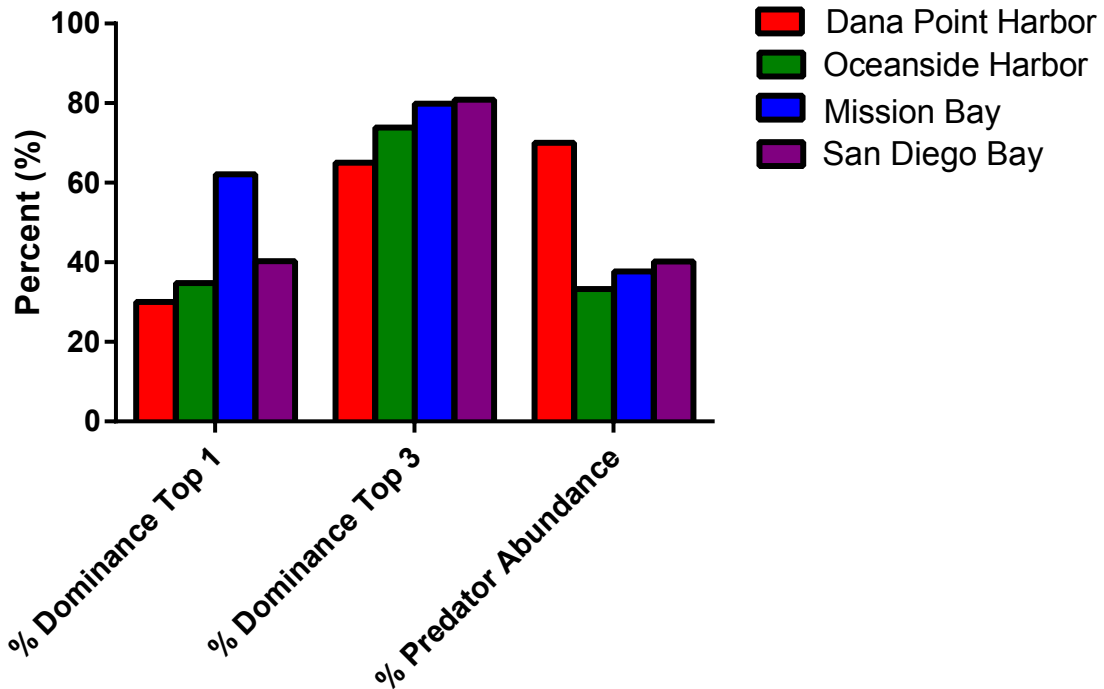
Fish Biomass



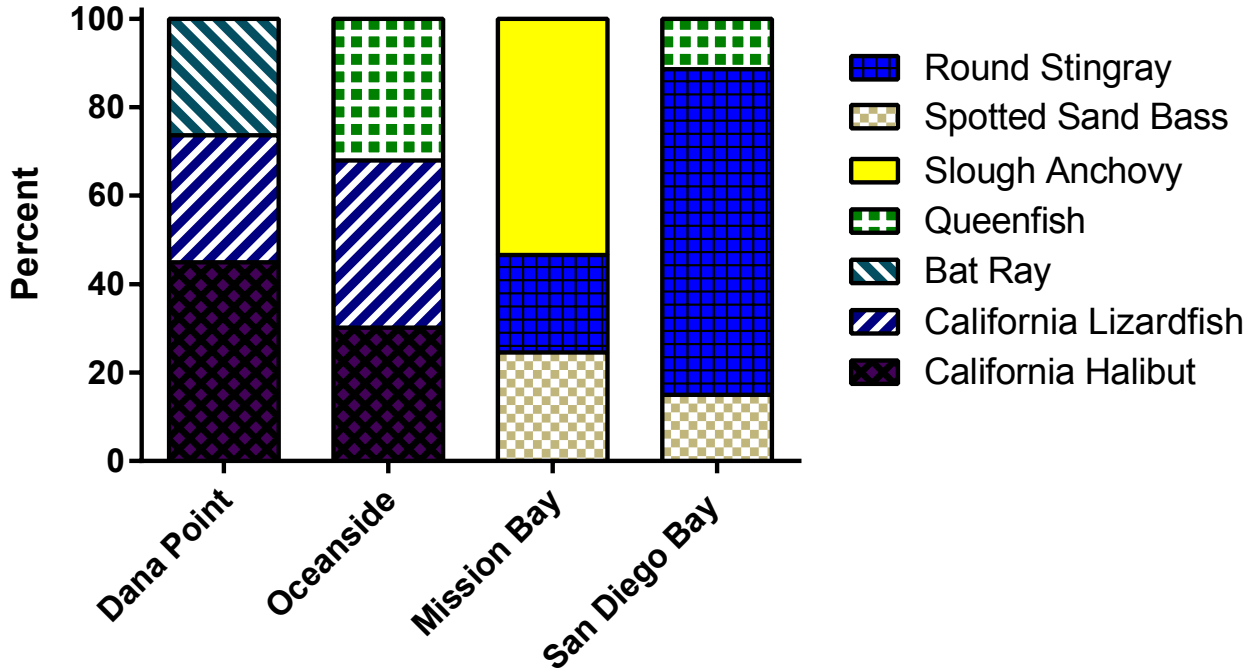
Fish Biodiversity Metrics by Bay RHMP 2013



Fish Taxa Distribution by Bay RHMP 2013



Fish Ecological Index by Harbor - RHMP 2013



Invertebrate Catch Summary Tables and Metrics

Table I-6. Trawl Caught Benthic Macroinvertebrate Species Abundances - RHMP 2013

| Scientific Name | Dana Point Harbor | Oceanside Harbor | Mission Bay | | | San Diego Bay | | | | | | | | | Total Abundance per Taxa | % of Total Abundance | Frequency of Trawl Capture (%) | |
|---------------------------------------|-------------------|------------------|--------------|-----------|-----------|---------------|-----------|----------|-------------|-----------|-----------|-----------|-----------|-----------|--------------------------|----------------------|--------------------------------|-------|
| | 8263 | 8239 | 8159 | 8152 | 8156 | North Bay | | | Central Bay | | | South Bay | | | | | | |
| | | | | | | 8122 | 8118 | 8109 | 8078 | 8060 | 8058 | 8052 | 8029 | 8017 | | | | 8020 |
| <i>Acanthoptilum</i> sp. | | | | | | | | 3 | 3 | | | | | | | 6 | 1.31 | 13.33 |
| <i>Alia carinata</i> | | | | | 36 | | | | | | | | | | | 36 | 7.88 | 6.67 |
| <i>Anoplodactylus erectus</i> | | | | | | | | | 1 | | | | | | | 1 | 0.22 | 6.67 |
| <i>Arcularia tiarula</i> | | | 1 | | | | | | | 3 | | | | | | 4 | 0.88 | 13.33 |
| <i>Argopecten ventricosus</i> | | | | | 3 | | | | | | | | | | | 3 | 0.66 | 6.67 |
| <i>Bulla gouldiana</i> | 4 | 1 | | | | | | | | 3 | | | | | | 8 | 1.75 | 20.00 |
| <i>Chlorostoma aureotincta</i> | | | | | 1 | | | | | | | | | | | 1 | 0.22 | 6.67 |
| <i>Chlorostoma eiseni</i> | 1 | | | | | | | | | | | | | | | 1 | 0.22 | 6.67 |
| <i>Conus californicus</i> | | 1 | | | 1 | | | | | | | | | | | 2 | 0.44 | 13.33 |
| <i>Crangon nigromaculata</i> | 1 | 1 | | | | | | | | | | | | | | 2 | 0.44 | 13.33 |
| <i>Dendraster excentricus</i> | | | | 1 | | | | | | | | | | | | 1 | 0.22 | 6.67 |
| <i>Diaulula sandiegensis</i> | | | | | | | | | 1 | | | | | | | 1 | 0.22 | 6.67 |
| <i>Epiactis prolifera</i> | | | 70 | | | | | | | | | | | | | 70 | 15.32 | 6.67 |
| <i>Farfantepenaeus californiensis</i> | | 1 | 5 | | | | 2 | | | | | 1 | | | | 9 | 1.97 | 26.67 |
| <i>Harmathoe</i> sp. | | | | | 1 | | | | 1 | | | | | | | 2 | 0.44 | 13.33 |
| <i>Heptacarpus palpator</i> | | | | 1 | | | | | | | | | | | | 1 | 0.22 | 6.67 |
| <i>Hippolyte californiensis</i> | | | | | 16 | | | | | | | | | 1 | | 17 | 3.72 | 13.33 |
| <i>Janolus barbarentis</i> | | | | | | | | | 2 | | | | | | | 2 | 0.44 | 6.67 |
| <i>Lophopanopeus frontalis</i> | | | | | | 3 | | | | 1 | | | | 1 | 1 | 6 | 1.31 | 26.67 |
| <i>Lytechinus pictus</i> | | | | | 2 | | | | | | | | | | | 2 | 0.44 | 6.67 |
| <i>Megastraea undosa</i> | | | | | 6 | | | | | | | | | | | 6 | 1.31 | 6.67 |
| <i>Metacarcinus gracilis</i> | | | | | | 1 | | | | | | | | | | 1 | 0.22 | 6.67 |
| <i>Musculista senhousia</i> | | | 5 | | | | | | | 57 | 14 | 13 | 9 | 3 | 34 | 135 | 29.54 | 46.67 |
| <i>Navanax inermis</i> | 1 | | | 3 | 1 | | | | | | | | 5 | 1 | | 11 | 2.41 | 33.33 |
| <i>Norrisia norrisi</i> | | | | | 1 | | | | | | | | | | | 1 | 0.22 | 6.67 |
| <i>Ophiocnida hispida</i> | | | | | | | | | 1 | | | | | | | 1 | 0.22 | 6.67 |
| <i>Ophiothrix spiculata</i> | | | | 7 | | | | | | | | | | | | 7 | 1.53 | 6.67 |
| <i>Ostrea lurida</i> | | | | | | 1 | 4 | | 1 | | | | | | | 6 | 1.31 | 20.00 |
| <i>Panulirus interruptus</i> | | | | | 9 | | | 1 | | | | | | | | 10 | 2.19 | 13.33 |
| <i>Portunus xantusii</i> | | 10 | | | | | | | | | 1 | | | | | 11 | 2.41 | 13.33 |
| <i>Pyromaia tuberculata</i> | | | | | | | | | 1 | 4 | 4 | 6 | | | | 15 | 3.28 | 26.67 |
| <i>Romaleon antennarium</i> | | 1 | | | | | | | | | | | | | | 1 | 0.22 | 6.67 |
| <i>Sicyonia disedwardsi</i> | | | | | 2 | | | | | | | | | | | 2 | 0.44 | 6.67 |
| Sponges | | | | | | | | | | | | | | | | | | |
| <i>Dragmacidon</i> sp. | | | | | | | | | 1 | | | | | | | 1 | 0.22 | 6.67 |
| <i>Halichondria bowerbanki</i> | | | 5 | 2 | 2 | | | | 1 | 4 | 6 | 1 | 3 | | | 24 | 5.25 | 53.33 |
| <i>Haliclona</i> sp. | | | | | | | 1 | | | | | | | | | 1 | 0.22 | 6.67 |
| <i>Tetilla</i> sp. | | | | | | | | | | 1 | | | | 30 | 2 | 33 | 7.22 | 20.00 |
| <i>Suberites latus</i> | | | | | | 1 | 11 | 1 | 1 | | | | | | | 14 | 3.06 | 26.67 |
| <i>Halichondria panicea</i> | | | | 1 | | | | | | | | | | | | 1 | 0.22 | 6.67 |
| <i>Silicea</i> | | | | | 1 | | | | | | | | | | | 1 | 0.22 | 6.67 |
| Total Abundance per Station | 7 | 15 | 86 | 15 | 82 | 6 | 18 | 5 | 14 | 73 | 25 | 21 | 17 | 36 | 37 | 457 | | |
| Means | 7 | 15 | 61.00 | | | 25.2 | | | | | | | | | 457 | | | |

Table I-7. Trawl Caught Benthic Macroinvertebrate Biomass (kg) - RHMP 2013

| Scientific Name | Dana Point Harbor | Oceanside Harbor | Mission Bay | | | San Diego Bay | | | | | | | | | Total Biomass per Taxa | % of Total Biomass | |
|---------------------------------------|-------------------|------------------|-------------|------------|------------|---------------|------------|------------|-------------|------------|------------|------------|------------|------------|------------------------|--------------------|------|
| | | | | | | North Bay | | | Central Bay | | | South Bay | | | | | |
| | | | | | | 8122 | 8118 | 8109 | 8078 | 8060 | 8058 | 8052 | 8029 | 8017 | | | 8020 |
| <i>Acanthoptilum</i> sp | | | | | | | | < 0.1 | < 0.1 | | | | | | | 0.20 | 0.8 |
| <i>Alia carinata</i> | | | | | < 0.1 | | | | | | | | | | | 0.10 | 0.4 |
| <i>Anoplodactylus erectus</i> | | | | | | | | | < 0.1 | | | | | | | 0.10 | 0.4 |
| <i>Arcularia tiarula</i> | | | < 0.1 | | | | | | | < 0.1 | | | | | | 0.20 | 0.8 |
| <i>Argopecten ventricosus</i> | | | | | < 0.1 | | | | | | | | | | | 0.10 | 0.4 |
| <i>Bulla gouldiana</i> | < 0.1 | < 0.1 | | | | | | | | < 0.1 | | | | | | 0.30 | 1.2 |
| <i>Chlorostoma aureotincta</i> | | | | | < 0.1 | | | | | | | | | | | 0.10 | 0.4 |
| <i>Chlorostoma eiseni</i> | < 0.1 | | | | | | | | | | | | | | | 0.10 | 0.4 |
| <i>Conus californicus</i> | | < 0.1 | | | < 0.1 | | | | | | | | | | | 0.20 | 0.8 |
| <i>Crangon nigromaculata</i> | < 0.1 | < 0.1 | | | | | | | | | | | | | | 0.20 | 0.8 |
| <i>Dendraster excentricus</i> | | | | < 0.1 | | | | | | | | | | | | 0.10 | 0.4 |
| <i>Diaulula sandiegensis</i> | | | | | | | | | < 0.1 | | | | | | | 0.10 | 0.4 |
| <i>Dragmacidon</i> sp | | | | | | | | | 0.3 | | | | | | | 0.30 | 1.2 |
| <i>Epiactis prolifera</i> | | | < 0.1 | | | | | | | | | | | | | 0.10 | 0.4 |
| <i>Farfantepenaeus californiensis</i> | | < 0.1 | 0.1 | | | | 0.1 | | | | | < 0.1 | | | | 0.40 | 1.6 |
| <i>Halichondria bowerbanki</i> | | | < 0.1 | 0.7 | < 0.1 | | | | 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | | | 1.40 | 5.5 |
| <i>Halichondria panicea</i> | | | | < 0.1 | | | | | | | | | | | | 0.10 | 0.4 |
| <i>Haliclona</i> sp | | | | | | | < 0.1 | | | | | | | | | 0.10 | 0.4 |
| <i>Harmothoe</i> sp | | | | | < 0.1 | | | | < 0.1 | | | | | | | 0.20 | 0.8 |
| <i>Heptacarpus palpator</i> | | | | < 0.1 | | | | | | | | | | | | 0.10 | 0.4 |
| <i>Hippolyte californiensis</i> | | | | | < 0.1 | | | | | | | | < 0.1 | | | 0.20 | 0.8 |
| <i>Janolus barborensis</i> | | | | | | | | | < 0.1 | | | | | | | 0.10 | 0.4 |
| <i>Lophopanopeus frontalis</i> | | | | | | < 0.1 | | | | < 0.1 | | | < 0.1 | < 0.1 | | 0.40 | 1.6 |
| <i>Lytechinus pictus</i> | | | | | < 0.1 | | | | | | | | | | | 0.10 | 0.4 |
| <i>Megastraea undosa</i> | | | | | < 0.1 | | | | | | | | | | | 0.10 | 0.4 |
| <i>Metacarcinus gracilis</i> | | | | | | < 0.1 | | | | | | | | | | 0.10 | 0.4 |
| <i>Musculista senhousia</i> | | | < 0.1 | | | | | | | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | 0.70 | 2.8 |
| <i>Navanax inermis</i> | < 0.1 | | | < 0.1 | < 0.1 | | | | | | | | < 0.1 | < 0.1 | | 0.50 | 2.0 |
| <i>Norrisia norrisi</i> | | | | | < 0.1 | | | | | | | | | | | 0.10 | 0.4 |
| <i>Ophiocnida hispida</i> | | | | | | | | | < 0.1 | | | | | | | 0.10 | 0.4 |
| <i>Ophiothrix spiculata</i> | | | < 0.1 | | | | | | | | | | | | | 0.10 | 0.4 |
| <i>Ostrea lurida</i> | | | | | | < 0.1 | < 0.1 | | < 0.1 | | | | | | | 0.30 | 1.2 |
| <i>Panulirus interruptus</i> | | | | | 3.6 | | | 0.2 | | | | | | | | 3.80 | 15.0 |
| <i>Portunus xantusii</i> | | 0.1 | | | | | | | | < 0.1 | | | | | | 0.20 | 0.8 |
| <i>Pyromaia tuberculata</i> | | | | | | | | | < 0.1 | < 0.1 | < 0.1 | < 0.1 | | | | 0.40 | 1.6 |
| <i>Romaleon antennarium</i> | | 0.2 | | | | | | | | | | | | | | 0.20 | 0.8 |
| <i>Sicyonia disedwardsi</i> | | | | | < 0.1 | | | | | | | | | | | 0.10 | 0.4 |
| <i>Silicea</i> unid | | | | | < 0.1 | | | | | | | | | | | 0.10 | 0.4 |
| <i>Suberites latus</i> | | | | | | 1.8 | 3.9 | 2.5 | 1 | | | | | | | 9.20 | 36.4 |
| <i>Tetilla</i> sp | | | | | | | | | | 3.3 | | | 0.3 | 0.4 | | 4.00 | 15.8 |
| Total Biomass per Station | 0.4 | 0.7 | 0.5 | 1.2 | 4.9 | 2.1 | 4.2 | 2.8 | 2.2 | 3.9 | 0.4 | 0.4 | 0.3 | 0.7 | 0.6 | 25.3 | |
| Means | 0.40 | 0.70 | 2.20 | | | 1.8 | | | | | | | | | | | |

Note: When species weight was less than 0.1 kg, it was recorded as < 0.1 kg and when averaging biomass estimated at 0.1 kg.

Table I-8. Mean Biodiversity Metrics by Station for Benthic Macroinvertebrates - RHMP 2013

| Biodiversity Metric | Dana Point Harbor | Oceanside Harbor | Mission Bay | | | San Diego Bay | | | | | | | | | |
|-----------------------------|-------------------|------------------|-------------|-----|-----|---------------|------|------|-------------|------|------|------|-----------|------|------|
| | | | | | | North Bay | | | Central Bay | | | | South Bay | | |
| | | | | | | 8263 | 8239 | 8159 | 8152 | 8156 | 8122 | 8118 | 8109 | 8078 | 8060 |
| Taxa Richness | 4.0 | 6.0 | 5.0 | 6.0 | 15 | 4.0 | 4.0 | 3.0 | 11 | 7.0 | 4.0 | 4.0 | 3.0 | 5.0 | 3.0 |
| Abundance | 7.0 | 15 | 85 | 15 | 89 | 6.0 | 18 | 5.0 | 14 | 73 | 25 | 21 | 17 | 36 | 37 |
| Shannon-Wiener (H) | 1.2 | 1.2 | 0.7 | 1.5 | 2.0 | 1.2 | 1.0 | 1.0 | 2.3 | 0.9 | 1.1 | 0.9 | 1.0 | 0.7 | 0.7 |
| Pielou's Evenness Index (E) | 0.8 | 0.7 | 0.4 | 0.8 | 0.7 | 0.9 | 0.8 | 0.9 | 1.0 | 0.5 | 0.8 | 0.7 | 0.9 | 0.4 | 0.6 |
| % Dominance Top Taxa | 57 | 67 | 82 | 47 | 40 | 50 | 61 | 60 | 21 | 78 | 56 | 62 | 53 | 83 | 92 |

Table I-9. Mean Phyla Richness (%) by Harbor for Benthic Macroinvertebrates - RHMP 2013

| Phyla | Regional | Dana Point Harbor | Oceanside Harbor | Mission Bay | San Diego Bay All | North SD Bay | Central SD Bay | South SD Bay |
|------------------------|----------|-------------------|------------------|-------------|-------------------|--------------|----------------|--------------|
| % <i>Cnidaria</i> | 4 | 0.0 | 0.0 | 4 | 6.0 | 13 | 5.6 | 0.0 |
| % <i>Mollusca</i> | 35 | 75 | 33 | 39 | 26 | 13 | 33 | 33 |
| % <i>Arthropoda</i> | 32 | 25 | 67 | 22 | 37 | 50 | 28 | 33.3 |
| % <i>Echinodermata</i> | 3.3 | 0.0 | 0.0 | 13 | 1.9 | 0.0 | 5.6 | 0.0 |
| % <i>Annelida</i> | 1.1 | 0.0 | 0.0 | 4.3 | 1.9 | 0.0 | 5.6 | 0.0 |
| % <i>Porifera</i> | 27 | 0.0 | 0.0 | 17 | 27 | 25 | 22 | 33 |

**Table I-10. Benthic Invertebrate Ecological Indices, All Harbors
Combined - RHMP 2013**

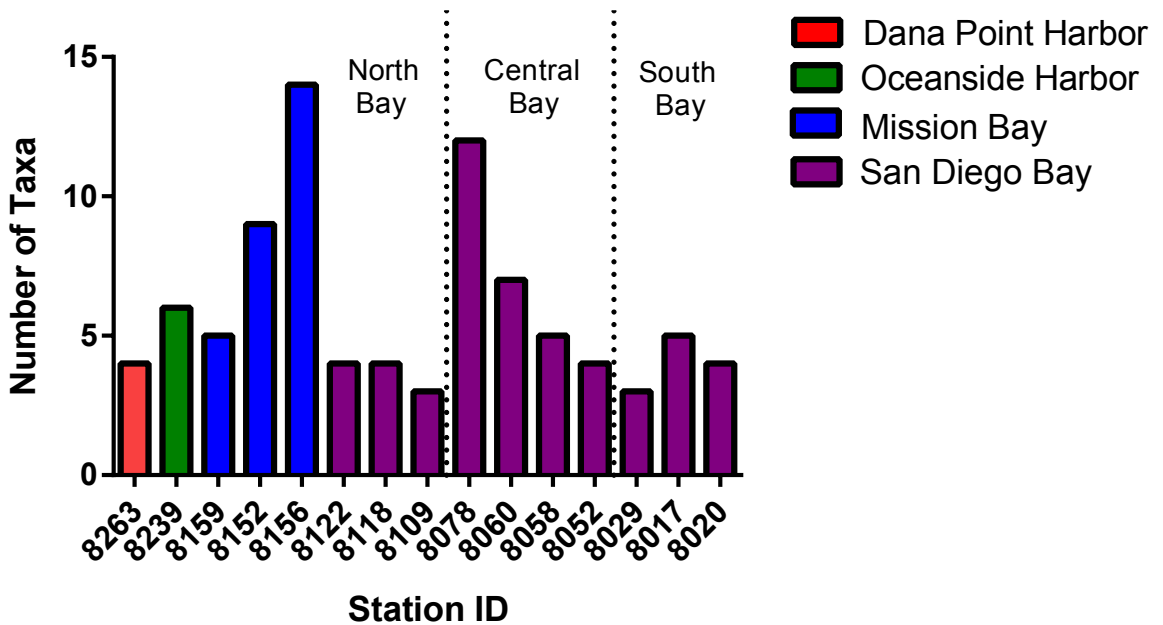
| Scientific Name | % of Total Abundance | Frequency of Trawl Capture (%) | % of Total Biomass | ECOLOGICAL INDEX |
|---------------------------------------|----------------------|--------------------------------|--------------------|------------------|
| <i>Musculista senhousia</i> | 29.1 | 47 | 0.46 | 1379 |
| <i>Suberites latus</i> | 3.0 | 27 | 42.1 | 1204 |
| <i>Tetilla sp.</i> | 7.1 | 20 | 17.9 | 500 |
| <i>Halichondria bowerbanki</i> | 5.2 | 53 | 3.91 | 484 |
| <i>Panulirus interruptus</i> | 2.2 | 13 | 17.49 | 262 |
| <i>Epiactis prolifera</i> | 15.1 | 7 | 0.46 | 104 |
| <i>Pyromaia tuberculata</i> | 3.2 | 27 | 0.46 | 98.4 |
| <i>Navanax inermis</i> | 2.4 | 33 | 0.46 | 94.3 |
| <i>Farfantepenaeus californiensis</i> | 1.9 | 27 | 1.02 | 78.9 |
| <i>Hippolyte californiensis</i> | 3.7 | 13 | 0.46 | 54.9 |
| <i>Alia carinata</i> | 7.8 | 7 | 0.46 | 54.8 |
| <i>Lophopanopeus frontalis</i> | 1.3 | 27 | 0.46 | 46.7 |
| <i>Bulla gouldiana</i> | 1.7 | 20 | 0.46 | 43.6 |
| <i>Portunus xantusii</i> | 2.4 | 13 | 0.57 | 39.2 |
| <i>Ostrea lurida</i> | 1.3 | 20 | 0.46 | 35.0 |
| <i>Acanthoptilum sp.</i> | 1.3 | 13 | 0.46 | 23.3 |
| <i>Arcularia tiarula</i> | 0.9 | 13 | 0.46 | 17.6 |
| <i>Chalinula loosanoffi</i> | 1.5 | 7 | 0.46 | 13.1 |
| <i>Ophiothrix spiculata</i> | 1.5 | 7 | 0.46 | 13.1 |
| <i>Conus californicus</i> | 0.4 | 13 | 0.46 | 11.8 |
| <i>Crangon nigromaculata</i> | 0.4 | 13 | 0.46 | 11.8 |
| <i>Harmathoe sp.</i> | 0.4 | 13 | 0.46 | 11.8 |
| <i>Megastraea undosa</i> | 1.3 | 7 | 0.46 | 11.7 |
| <i>Dragmacidon sp.</i> | 0.2 | 7 | 1.22 | 9.54 |
| <i>Argopecten ventricosus</i> | 0.6 | 7 | 0.46 | 7.36 |
| <i>Romaleon antennarium</i> | 0.2 | 7 | 0.69 | 6.01 |
| <i>Janolus barbarensis</i> | 0.4 | 7 | 0.46 | 5.92 |
| <i>Lytechinus pictus</i> | 0.4 | 7 | 0.46 | 5.92 |
| <i>Sicyonia disedwardsi</i> | 0.4 | 7 | 0.46 | 5.92 |
| <i>Anoplodactylus erectus</i> | 0.2 | 7 | 0.46 | 4.48 |
| <i>Chlorostoma aureotincta</i> | 0.2 | 7 | 0.46 | 4.48 |
| <i>Chlorostoma eiseni</i> | 0.2 | 7 | 0.46 | 4.48 |
| <i>Dendraster excentricus</i> | 0.2 | 7 | 0.46 | 4.48 |
| <i>Diaulula sandiegensis</i> | 0.2 | 7 | 0.46 | 4.48 |
| <i>Halichondria panicea</i> | 0.2 | 7 | 0.46 | 4.48 |
| <i>Haliclona sp.</i> | 0.2 | 7 | 0.46 | 4.48 |
| <i>Heptacarpus palpator</i> | 0.2 | 7 | 0.46 | 4.48 |
| <i>Metacarcinus gracilis</i> | 0.2 | 7 | 0.46 | 4.48 |
| <i>Norrisia norrisi</i> | 0.2 | 7 | 0.46 | 4.48 |
| <i>Ophiocnida hispida</i> | 0.2 | 7 | 0.46 | 4.48 |

**Table I-11. Benthic Invertebrate Ecological Indices, Sorted By Harbor- RHMP
2013**

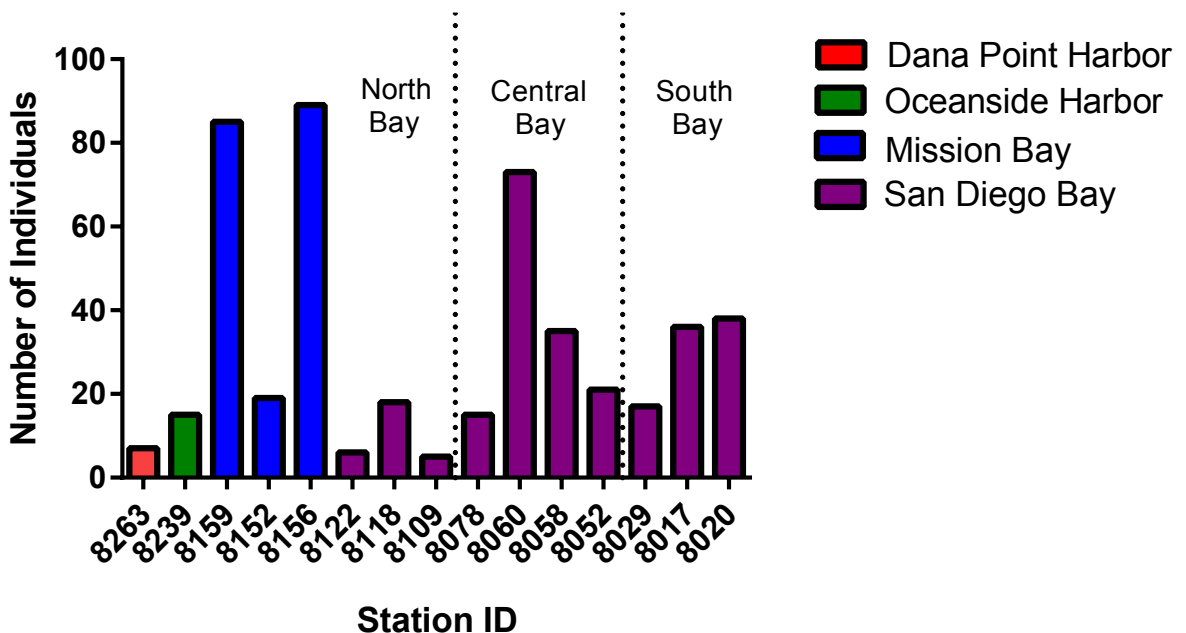
| Harbor | Scientific Name | % of Total Abundance | Frequency of Trawl Capture (%) | % of Total Biomass | ECOLOGICAL INDEX |
|------------------|---------------------------------------|----------------------|--------------------------------|--------------------|------------------|
| Dana Point | <i>Bulla gouldiana</i> | 57.1 | 100 | 25.0 | 8214 |
| Dana Point | <i>Chlorostoma eiseni</i> | 14.3 | 100 | 25.0 | 3929 |
| Dana Point | <i>Crangon nigromaculata</i> | 14.3 | 100 | 25.0 | 3929 |
| Dana Point | <i>Navanax inermis</i> | 14.3 | 100 | 25.0 | 3929 |
| Mission Bay | <i>Panulirus interruptus</i> | 4.8 | 33.3 | 56.3 | 2034 |
| Mission Bay | <i>Halichondria bowerbanki</i> | 4.8 | 100 | 10.9 | 1570 |
| Mission Bay | <i>Epiactis prolifera</i> | 37.0 | 33.3 | 1.6 | 1287 |
| Mission Bay | <i>Alia carinata</i> | 19.0 | 33.3 | 1.6 | 687 |
| Mission Bay | <i>Hippolyte californiensis</i> | 8.5 | 33.3 | 1.6 | 334 |
| Mission Bay | <i>Navanax inermis</i> | 2.1 | 66.7 | 1.6 | 245 |
| Mission Bay | <i>Chalinula loosanoffi</i> | 3.7 | 33.3 | 1.6 | 176 |
| Mission Bay | <i>Ophiothrix spiculata</i> | 3.7 | 33.3 | 1.6 | 176 |
| Mission Bay | <i>Megastraea undosa</i> | 3.2 | 33.3 | 1.6 | 158 |
| Mission Bay | <i>Farfantepenaeus californiensis</i> | 2.6 | 33.3 | 1.6 | 140 |
| Mission Bay | <i>Musculista senhousia</i> | 2.1 | 33.3 | 1.6 | 123 |
| Mission Bay | <i>Argopecten ventricosus</i> | 1.6 | 33.3 | 1.6 | 105 |
| Mission Bay | <i>Lytechinus pictus</i> | 1.1 | 33.3 | 1.6 | 87.4 |
| Mission Bay | <i>Sicyonia disedwardsi</i> | 1.1 | 33.3 | 1.6 | 87.4 |
| Mission Bay | <i>Arcularia tiarula</i> | 0.5 | 33.3 | 1.6 | 69.7 |
| Mission Bay | <i>Chlorostoma aureotincta</i> | 0.5 | 33.3 | 1.6 | 69.7 |
| Mission Bay | <i>Conus californicus</i> | 0.5 | 33.3 | 1.6 | 69.7 |
| Mission Bay | <i>Dendraster excentricus</i> | 0.5 | 33.3 | 1.6 | 69.7 |
| Mission Bay | <i>Halichondria panicea</i> | 0.5 | 33.3 | 1.6 | 69.7 |
| Mission Bay | <i>Harmathoe</i> sp. | 0.5 | 33.3 | 1.6 | 69.7 |
| Mission Bay | <i>Heptacarpus palpator</i> | 0.5 | 33.3 | 1.6 | 69.7 |
| Mission Bay | <i>Norrisia norrisi</i> | 0.5 | 33.3 | 1.6 | 69.7 |
| Mission Bay | <i>Silicea</i> | 0.5 | 33.3 | 1.6 | 69.7 |
| Oceanside Harbor | <i>Portunus xantusii</i> | 66.7 | 100.0 | 18.5 | 8518.5 |
| Oceanside Harbor | <i>Romaleon antennarium</i> | 6.7 | 100.0 | 22.2 | 2888.9 |
| Oceanside Harbor | <i>Bulla gouldiana</i> | 6.7 | 100.0 | 14.8 | 2148.1 |
| Oceanside Harbor | <i>Conus californicus</i> | 6.7 | 100.0 | 14.8 | 2148.1 |
| Oceanside Harbor | <i>Crangon nigromaculata</i> | 6.7 | 100.0 | 14.8 | 2148.1 |
| Oceanside Harbor | <i>Farfantepenaeus californiensis</i> | 6.7 | 100.0 | 14.8 | 2148.1 |
| SD Bay North | <i>Musculista senhousia</i> | 51.6 | 60.0 | 0.6 | 3133.7 |
| SD Bay | <i>Suberites latus</i> | 5.6 | 40.0 | 59.1 | 2586.7 |
| SD Bay | <i>Tetilla</i> sp. | 13.1 | 30.0 | 25.1 | 1145.2 |
| SD Bay | <i>Halichondria bowerbanki</i> | 6.0 | 50.0 | 1.3 | 361.7 |
| SD Bay | <i>Pyromaia tuberculata</i> | 6.0 | 40.0 | 0.6 | 263.7 |
| SD Bay | <i>Lophopanopeus frontalis</i> | 2.4 | 40.0 | 0.6 | 120.9 |
| SD Bay | <i>Ostrea lurida</i> | 2.4 | 30.0 | 0.6 | 90.7 |
| SD Bay | <i>Acanthoptilum</i> sp | 2.4 | 20.0 | 0.6 | 60.4 |
| SD Bay | <i>Navanax inermis</i> | 2.4 | 20.0 | 0.6 | 60.4 |
| SD Bay | <i>Farfantepenaeus californiensis</i> | 1.2 | 20.0 | 0.6 | 36.6 |
| SD Bay | <i>Dragmacidon</i> sp | 0.4 | 10.0 | 1.7 | 21.0 |
| SD Bay | <i>Arcularia tiarula</i> | 1.2 | 10.0 | 0.6 | 18.3 |
| SD Bay | <i>Bulla gouldiana</i> | 1.2 | 10.0 | 0.6 | 18.3 |
| SD Bay | <i>Panulirus interruptus</i> | 0.4 | 10.0 | 1.3 | 16.8 |
| SD Bay | <i>Janolus barbarensis</i> | 0.8 | 10.0 | 0.6 | 14.3 |
| SD Bay | <i>Anoplodactylus erectus</i> | 0.4 | 10.0 | 0.6 | 10.4 |
| SD Bay | <i>Diaulula sandiegensis</i> | 0.4 | 10.0 | 0.6 | 10.4 |
| SD Bay | <i>Haliclona</i> sp. | 0.4 | 10.0 | 0.6 | 10.4 |
| SD Bay | <i>Harmathoe</i> sp. | 0.4 | 10.0 | 0.6 | 10.4 |
| SD Bay | <i>Hippolyte californiensis</i> | 0.4 | 10.0 | 0.6 | 10.4 |
| SD Bay | <i>Metacarcinus gracilis</i> | 0.4 | 10.0 | 0.6 | 10.4 |
| SD Bay | <i>Ophiocnida hispida</i> | 0.4 | 10.0 | 0.6 | 10.4 |
| SD Bay | <i>Portunus xantusii</i> | 0.4 | 10.0 | 0.6 | 10.4 |

Invertebrate Metric Graphical Summaries

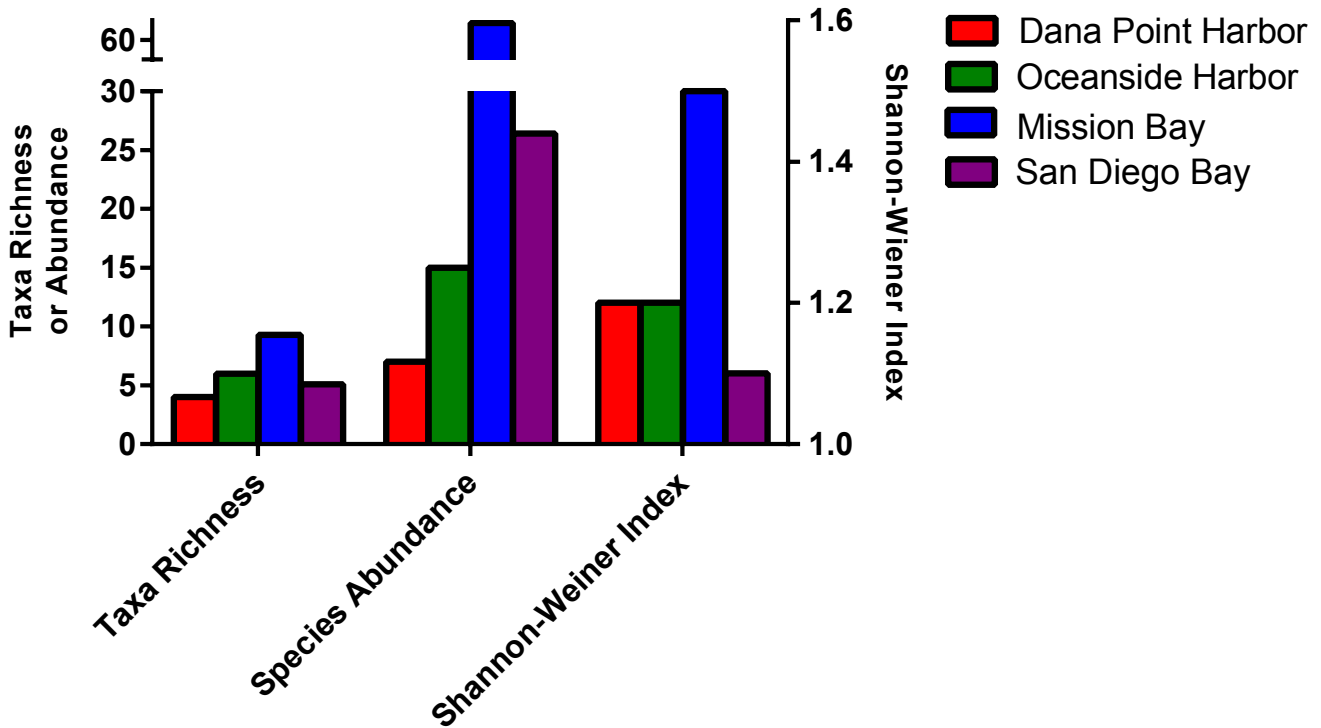
Invertebrate Taxa Richness by Site RHMP 2013 Trawls



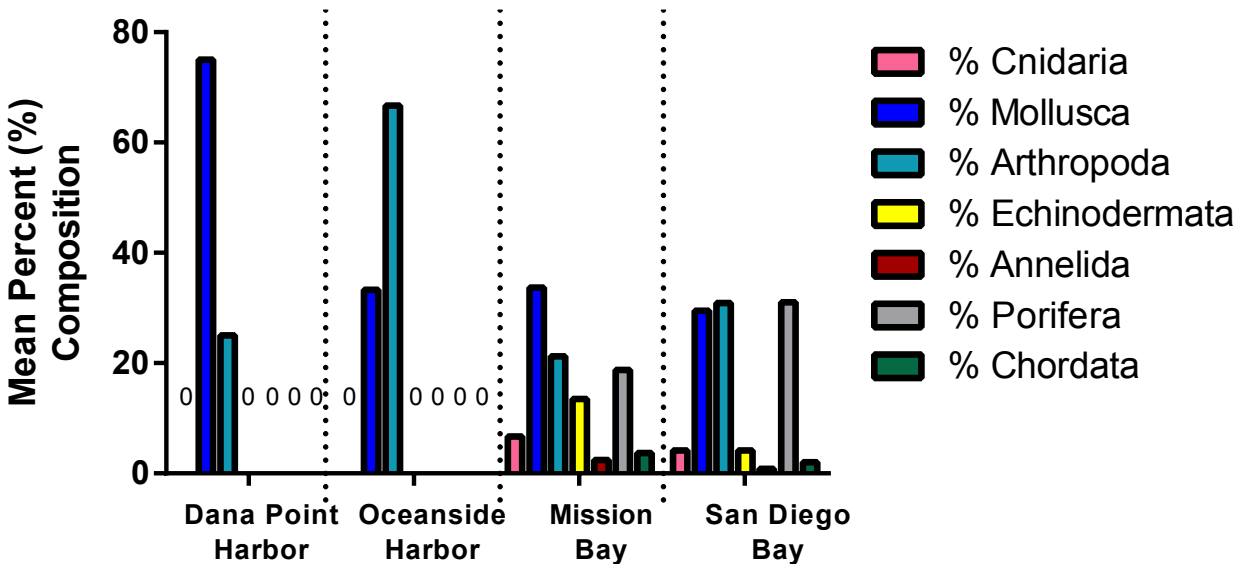
Invertebrate Species Abundance by Site RHMP 2013 Trawls



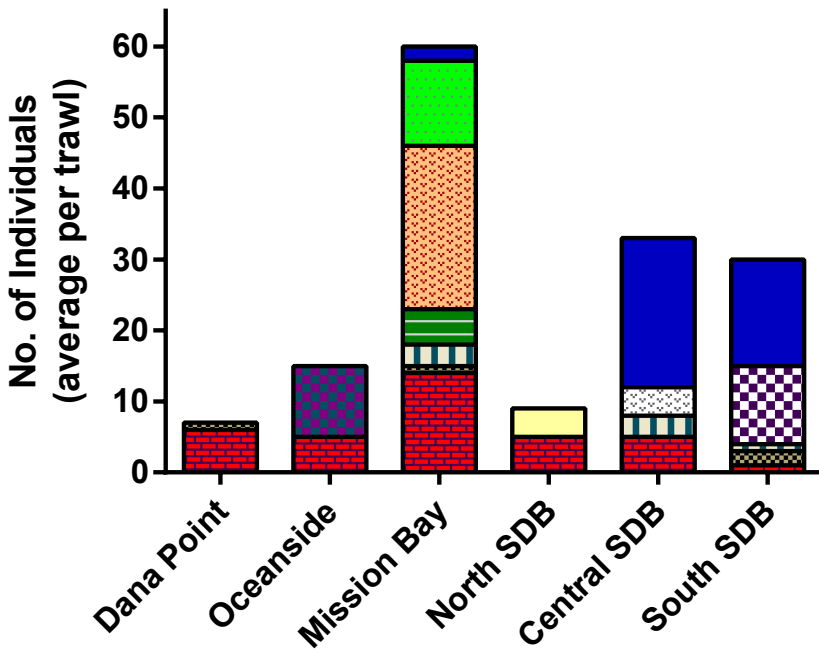
Invertebrate Biodiversity Metrics by Harbor 2013 Trawls



Invertebrate Phyla Richness by Harbor RHMP 2013

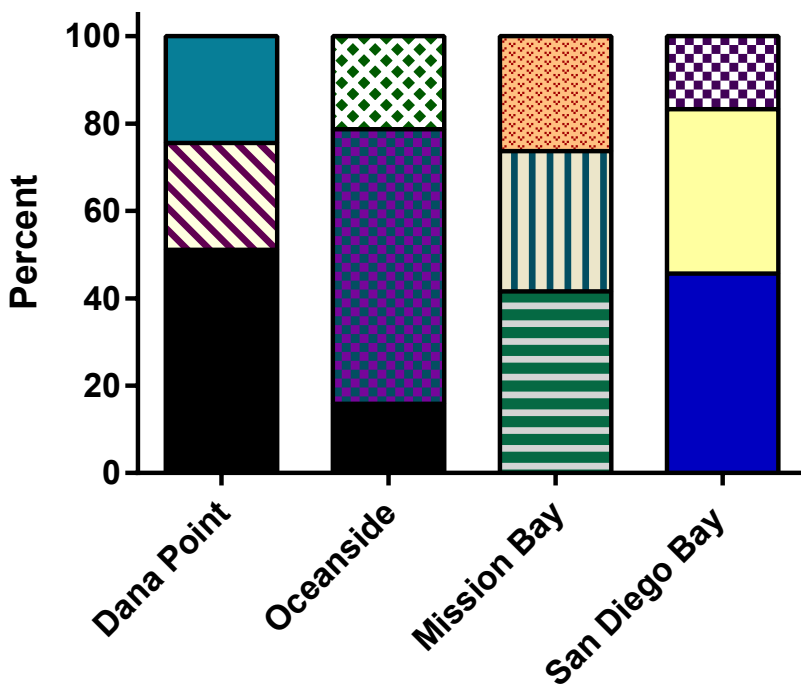


Benthic Macroinvertebrate Abundance



- Navanax inermis*
- Tetilla sp.*
- Halichondria bowerbanki*
- Pyromaia tuberculata*
- Musculista senhousia*
- Suberites latus*
- Portunus xantusii*
- Hippolyte californiensis*
- Alia carinata*
- Epiactis prolifera*
- Other

Ecological Index Epibenthic Invertebrates



- Tetilla sp.*
- Suberites latus*
- Musculista senhousia*
- Romaleon antennarium*
- Portunus xantusii*
- Epiactis prolifera*
- Halichondria bowerbanki*
- Panulirus interruptus*
- Crangon nigromaculata*
- Chlorostoma eiseni*
- Bulla gouldiana*