Table 1 Number of eDNA metabarcoding reads and macrofaunal Polychaeta individuals at each of six sampled farm sites

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | BI | BS | MI | MR | PP | VP | Overall |
| No. of eukaryote reads | 7,816,158 | 5,752,434 | 6,233,606 | 6,637,413 | 9,782,205 | 6,082,027 | 42,303,843 |
| No. of metazoan reads | 1,601,232 | 1,513,425 | 1,909,814 | 1,171,276 | 1,647,272 | 4,707,315 | 12,550,334 |
| No. of benthic metazoan reads | 913,866 | 163,707 | 646,120 | 253,574 | 58,500 | 1,388,311 | 3,424,078 |
| No. of Polychaeta individuals | 1,279 | 431 | 3,395 | 763 | 1,029 | 4,548 | 11,445 |
| No. of *Capitella* individuals | 289 | 222 | 3,009 | 179 | 217 | 3,927 | 7,843 |

Table 2 The six OTUs found in this study with relative abundances that differed significantly among organic enrichment statuses based on ANOVA

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| OTU ID | Oxic A (%)  (Mean±SE) | Oxic B (%)  (Mean±SE) | Hypoxic (%)  (Mean±SE) | Anoxic (%)  (Mean±SE) | P value (corrected) | Assigned taxonomy |
| c94fc2ac2f0dc7c32b3decffc60bfc12 | 10.11±1.67b | 48.90±5.49a | 13.99±3.75b | 4.21±1.93b | <0.001 | *Sabatieria punctata* |
| 413e5941a757176c5279c986fdbf71fa | 5.07±1.31b | 1.83±1.14b | 17.87±4.70a | 19.27±4.92a | 0.002 | *Cytheromorpha acupunctata* |
| 279406089f55f06babaadbc159433687 | 0.10±0.03b | 0.50±0.31b | 1.61±0.51a | 0.35±0.14b | 0.003 | *Pyura haustor* |
| ab77ddef8d8bc35495470b973b5cc456 | 0.01±0.01b | 0.08±0.06b | 0.11±0.05b | 0.76±0.28a | 0.003 | *Chelyosoma siboja* |
| 63f22c095c57b5d48c4d4be39cfc3c7d | 0.31±0.11b | 0.77±0.28b | 1.65±0.54b | 4.95±1.85a | 0.007 | *Panopea abrupta* |
| 1f8805bbb0e88710c5cac7d1bdad3e00 | 6.28±1.45a | 0b | 0b | 0b | 0.014 | *Sabatieria punctata* |

Table 3 The OTUs showing significant association with organic enrichment status (across six salmon farms sampled) based on Pearson’s phi coefficient of association analysis

|  |  |  |  |
| --- | --- | --- | --- |
| OTU ID | Status | P (corrected) | Assigned taxonomy |
| 1f8805bbb0e88710c5cac7d1bdad3e00 | oxic A | 0.002 | *Sabatieria punctata* |
| 60284b60bdc27a164f201da7800b2ac8 | oxic A | 0.002 | *Chromadorita tentabundum* |
| 8cdc54bc50625ff91a74a550bf3c118c | oxic A | 0.002 | Chromadorida |
| b8d42d074f414bcd2f6f5889fd892cc3 | oxic A | 0.002 | Monhysterida |
| 0996aacc856a483281d3be613bab551f | oxic A | 0.002 | Enoplida |
| 0c74a3e12188a2d56a806a77158f9dc2 | oxic A | 0.002 | *Daptonema procerus* |
| 15a9bb8d85d8515b06010fed06202bc9 | oxic A | 0.002 | Chromadorea |
| 4ef139bd7d81aac77b431612d0e13916 | oxic A | 0.002 | Chaetonotida |
| d374a4837b249c6d39a5bcc9ab922a7f | oxic A | 0.002 | Chromadorea |
| 33904e0994ae6d142437d74d88eb4245 | oxic A | 0.002 | *Onuphis elegans* |
| bc65359c308bf5af0a6827ec3e897d0b | oxic A | 0.002 | *Aurospio dibranchiata* |
| 2dc28ff6d46fed30709e36b300620e9b | oxic A | 0.004 | Chromadorea |
| 566d30551d5f2ea155876fc3b47d88d2 | oxic A | 0.004 | Monhysterida |
| 4242918b7ae922e44d0eac9959eabbd1 | oxic A | 0.002 | Desmodorida |
| f72c0d75ed89faf9eeca99382d6c492d | oxic A | 0.005 | *Corella inflata* |
| 010d860f34edf9d46ce4949140b5a852 | oxic A | 0.008 | *Terschellingia longicaudata* |
| 9835f6457ad1ad891c5bf4d0d01e8252 | oxic A | 0.011 | *Daptonema procerus* |
| 41109835c39a086a6115bad91bd8c311 | oxic A | 0.013 | *Daptonema procerus* |
| 892ecf2050f4c3612063c1e2d6037c78 | oxic A | 0.011 | *Terschellingia longicaudata* |
| 83c6545312acfe5ccfc31ebb3cc2a308 | oxic A | 0.009 | *Paracyatholaimus intermedius* |
| 1e9cb319932c36c787ee9ec312900996 | oxic A | 0.012 | *Leitoscoloplos pugettensis* |
| f29b98a9d2d41d0a95fd6892a5562a92 | oxic A | 0.020 | *Achromadora cf terricola* |
| 0b175f3974d0340c7d9bbe08fae7e509 | oxic A | 0.020 | *Terschellingia longicaudata* |
| ad57ea6ace161fb8dc7fc02584ae5da7 | oxic A | 0.031 | *Astomonema* sp*.* |
| 515429f43cdf8e144845eab0c27a6614 | oxic A | 0.042 | Chromadorida |
| 965b62136edbb42b6346e7325ef42ce9 | oxic A | 0.042 | *Notomastus tenuis* |
| 580475013c66a072166810a25e943003 | oxic B | 0.002 | *Gunnarea capensis* |
| 738d1f29ebb635e5c16a8e31ba7fbfad | oxic B | 0.002 | *Capitella capitata* |
| 6459197a0a0ad0ee64af441097e09836 | oxic B | 0.002 | Monhysterida |
| c94fc2ac2f0dc7c32b3decffc60bfc12 | oxic B | 0.002 | *Sabatieria punctata* |
| baba65d3e058860397c22500b70ddebb | oxic B | 0.002 | Pectinoida |
| 68743207db3a26c7a71d9b619da76657 | oxic B | 0.005 | *Cytheromorpha acupunctata* |
| a141d3acc2c15ff72b37b2c96931edc6 | oxic B | 0.020 | Araeolaimida |
| 6b4a9ac4e95a3765800dd20fd4c38df5 | oxic B | 0.030 | Bilateria |
| ad27650ba722bf3535988a125f25b94d | anoxic | 0.007 | *Cnemidocarpa finmarkiensis* |

Table 4 The 10 OTUs with highest importance scores for prediction of organic enrichment status based on machine learning analysis

|  |  |  |
| --- | --- | --- |
| OTU ID | Importance | Assigned taxonomy |
| c94fc2ac2f0dc7c32b3decffc60bfc12 | 0.083 | *Sabatieria punctata* |
| 738d1f29ebb635e5c16a8e31ba7fbfad | 0.042 | *Capitella capitata* |
| 580475013c66a072166810a25e943003 | 0.036 | *Gunnarea capensis* |
| d87e2dcfcd46be498befd1b26bd0a6af | 0.026 | *Halocynthia igaboja* |
| 06944a0f588037d8726df45c7d4ff9f1 | 0.025 | *Diopatra chilienis* |
| f216fd1d91eba261d40fcf8afff08f76 | 0.024 | *Chromadorita leuckarti* |
| b181f5d113cf8259f08f10f70e7d3669 | 0.022 | Actiniaria |
| baba65d3e058860397c22500b70ddebb | 0.022 | Pectinoida |
| 6459197a0a0ad0ee64af441097e09836 | 0.020 | Monhysterida |
| 83c6545312acfe5ccfc31ebb3cc2a308 | 0.020 | *Paracyatholaimus intermedius* |