**Table S2** List of indicators for a) Norway and b) Scotland datasets sorted by relative abundance and their assigned taxonomic affiliation and Eco-group. With bold are indicated the ASVs that were in the top 20 ASVs with the highest importance value by Random Forest (RF).

1. Norway

|  |  |  |  |
| --- | --- | --- | --- |
| ASV | Taxa name | Eco-group | Relative abundance |
| **ASV\_000031** | **Myxococcales** | **III** | **1.03** |
| **ASV\_000024** | **Alteromonadales** | **IV** | **0.92** |
| ASV\_000043 | Myxococcales | III | 0.90 |
| **ASV\_000040** | **Myxococcales** | **II** | **0.86** |
| ASV\_000016 | Helicobacteraceae | IV | 0.83 |
| **ASV\_000013** | **Helicobacteraceae** | **IV** | **0.72** |
| ASV\_000022 | Helicobacteraceae | IV | 0.54 |
| ASV\_000100 | *Psychromonas* | IV | 0.51 |
| **ASV\_000054** | **Syntrophobacteraceae** | **II** | **0.49** |
| ASV\_000039 | Bacteroidales | IV | 0.48 |
| ASV\_000038 | Thiohalorhabdales | IV | 0.46 |
| **ASV\_000036** | **Bacteroidales** | **IV** | **0.46** |
| **ASV\_000063** | **Rhodospirillales** | **II** | **0.45** |
| ASV\_000055 | Alteromonadales | IV | 0.41 |
| **ASV\_000126** | ***Nitrospina*** | **II** | **0.40** |
| ASV\_000076 | Desulfobulbaceae | IV | 0.36 |
| ASV\_000106 | Myxococcales | III | 0.36 |
| **ASV\_000044** | **Flavobacteriaceae** | **IV** | **0.35** |
| ASV\_000052 | Helicobacteraceae | IV | 0.30 |
| ASV\_000114 | *Desulfococcus* | II | 0.29 |
| ASV\_000026 | Acidimicrobiales | IV | 0.27 |
| ASV\_000066 | Caldilineaceae | IV | 0.27 |
| ASV\_000173 | *Psychromonas* | IV | 0.25 |
| ASV\_000046 | Helicobacteraceae | IV | 0.25 |
| ASV\_000233 | Myxococcales | I | 0.24 |
| **ASV\_000198** | **Gammaproteobacteria** | **II** | **0.23** |
| ASV\_000086 | Bacteroidales | IV | 0.22 |
| ASV\_000186 | Nitrospiraceae | II | 0.22 |
| ASV\_000155 | Myxococcales | III | 0.22 |
| ASV\_000033 | Enterobacteriaceae | III | 0.22 |
| ASV\_000085 | Flavobacteriaceae | IV | 0.20 |
| ASV\_000128 | Unknown bacteria | IV | 0.20 |
| ASV\_000098 | Caldilineaceae | IV | 0.20 |
| ASV\_000149 | Myxococcales | II | 0.20 |
| ASV\_000123 | Alteromonadales | IV | 0.19 |
| ASV\_000090 | Thiohalorhabdales | IV | 0.19 |
| ASV\_000238 | Piscirickettsiaceae | III | 0.18 |
| ASV\_000153 | Lachnospiraceae | IV | 0.17 |
| ASV\_000014 | Helicobacteraceae | IV | 0.17 |
| ASV\_000271 | Myxococcales | III | 0.17 |
| **ASV\_000296** | **Helicobacteraceae** | **IV** | **0.17** |
| **ASV\_000080** | ***Desulfosarcina*** | **IV** | **0.16** |
| ASV\_000268 | *Psychromonas* | IV | 0.16 |
| ASV\_000208 | *Psychromonas* | IV | 0.16 |
| ASV\_000276 | Gammaproteobacteria | II | 0.16 |
| ASV\_000165 | Desulfobacteraceae | IV | 0.16 |
| ASV\_000134 | Ruminococcaceae | IV | 0.16 |
| ASV\_000385 | Piscirickettsiaceae | II | 0.16 |
| ASV\_000273 | Myxococcales | II | 0.14 |
| ASV\_000456 | Acidimicrobiales | II | 0.14 |
| ASV\_000377 | Piscirickettsiaceae | II | 0.14 |
| ASV\_000357 | Nitrospiraceae | II | 0.14 |
| ASV\_000437 | Alphaproteobacteria | II | 0.14 |
| **ASV\_000217** | **Acidobacteria** | **III** | **0.14** |
| **ASV\_000053** | ***Lutimonas*** | **IV** | **0.12** |
| ASV\_000214 | Desulfarculaceae | IV | 0.12 |
| ASV\_000776 | Alteromonadales | II | 0.12 |
| ASV\_000488 | Myxococcales | I | 0.11 |
| ASV\_000420 | Gammaproteobacteria | II | 0.11 |
| ASV\_000472 | Gammaproteobacteria | II | 0.11 |
| **ASV\_000348** | **Bacteroidales** | **IV** | **0.11** |
| ASV\_000422 | Betaproteobacteria | I | 0.11 |
| ASV\_000243 | Chromatiales | III | 0.11 |
| ASV\_000281 | Desulfobacteraceae | IV | 0.11 |
| ASV\_000486 | Piscirickettsiaceae | II | 0.10 |
| ASV\_000050 | Helicobacteraceae | IV | 0.10 |
| ASV\_000171 | Gammaproteobacteria | IV | 0.10 |
| ASV\_000494 | Gemmatimonadetes | II | 0.10 |
| ASV\_000275 | Desulfobulbaceae | IV | 0.10 |
| ASV\_000438 | Flammeovirgaceae | III | 0.10 |
| ASV\_000662 | Piscirickettsiaceae | II | 0.10 |
| ASV\_001328 | Piscirickettsiaceae | II | 0.09 |
| ASV\_000064 | Lutimonas | IV | 0.09 |
| ASV\_000325 | Alteromonadales | II | 0.09 |
| ASV\_000323 | Verrucomicrobia | IV | 0.09 |
| ASV\_000528 | Myxococcales | II | 0.09 |
| ASV\_000188 | Desulfobulbaceae | IV | 0.09 |
| ASV\_000255 | Alteromonadales | IV | 0.09 |
| ASV\_000482 | Myxococcales | II | 0.08 |
| ASV\_000573 | Acidimicrobiales | III | 0.08 |
| ASV\_000254 | Acidimicrobiia | III | 0.08 |
| ASV\_000342 | Desulfobacteraceae | IV | 0.08 |
| ASV\_000340 | Bacteroidales | V | 0.08 |
| ASV\_000345 | Desulfobacteraceae | IV | 0.08 |
| ASV\_000344 | Bacteroidales | IV | 0.08 |
| ASV\_000306 | Desulfobulbaceae | II | 0.08 |
| ASV\_000458 | Alteromonadales | IV | 0.08 |
| ASV\_000334 | Myxococcales | II | 0.08 |
| ASV\_000361 | Alteromonadales | IV | 0.08 |
| ASV\_000504 | Pirellulaceae | I | 0.08 |
| ASV\_000262 | Desulfuromonadaceae | II | 0.08 |
| ASV\_000696 | Piscirickettsiaceae | II | 0.08 |
| ASV\_000366 | Sulfurimonas | IV | 0.08 |
| ASV\_000491 | Hyphomicrobiaceae | II | 0.07 |
| ASV\_000809 | Myxococcales | I | 0.07 |
| ASV\_000600 | Piscirickettsiaceae | III | 0.07 |
| ASV\_000748 | Myxococcales | II | 0.07 |
| ASV\_000393 | Desulfobulbaceae | III | 0.07 |
| ASV\_000167 | Lutimonas | IV | 0.07 |
| ASV\_000735 | Myxococcales | II | 0.07 |
| ASV\_000250 | Alteromonadales | IV | 0.07 |
| ASV\_000423 | Acidobacteria | III | 0.07 |
| ASV\_000786 | Piscirickettsiaceae | III | 0.07 |
| ASV\_000556 | Alphaproteobacteria | II | 0.07 |
| ASV\_000218 | Helicobacteraceae | IV | 0.07 |
| ASV\_000368 | Verrucomicrobia | IV | 0.07 |
| ASV\_000591 | Gemmatimonadetes | II | 0.07 |
| ASV\_000449 | Acidimicrobiales | II | 0.07 |
| ASV\_000414 | Unknown bacteria | IV | 0.07 |
| ASV\_000354 | Bacteroidales | IV | 0.07 |
| ASV\_000710 | Gammaproteobacteria | II | 0.07 |
| ASV\_000725 | Alteromonadales | II | 0.07 |
| **ASV\_000105** | **Helicobacteraceae** | **IV** | **0.07** |
| ASV\_000207 | Alteromonadales | IV | 0.07 |
| ASV\_000763 | Psychromonas | III | 0.07 |
| ASV\_000122 | Flavobacteriaceae | IV | 0.07 |
| ASV\_000314 | Alteromonadales | IV | 0.07 |
| ASV\_000324 | Deltaproteobacteria | III | 0.06 |
| ASV\_000749 | Alteromonadales | II | 0.06 |
| ASV\_000593 | Deltaproteobacteria | III | 0.06 |
| ASV\_000355 | Alteromonadales | IV | 0.06 |
| ASV\_000646 | Alteromonadales | II | 0.06 |
| ASV\_000586 | Acidobacteria | II | 0.06 |
| ASV\_000723 | Alphaproteobacteria | II | 0.06 |
| ASV\_000082 | Desulfobulbaceae | IV | 0.06 |
| ASV\_000721 | Psychromonas | IV | 0.06 |
| ASV\_000985 | Nitrospina | I | 0.06 |
| ASV\_000866 | Myxococcales | II | 0.06 |
| ASV\_000168 | Bacteroidales | III | 0.06 |
| ASV\_001190 | Acidimicrobiales | II | 0.06 |
| ASV\_000930 | Nitrosomonadaceae | I | 0.06 |
| ASV\_000532 | Verrucomicrobia | IV | 0.06 |
| ASV\_000708 | Acidimicrobiales | II | 0.06 |
| ASV\_000527 | Myxococcales | III | 0.06 |
| ASV\_001204 | Piscirickettsiaceae | II | 0.06 |
| ASV\_001120 | Acidobacteria | II | 0.06 |
| ASV\_000443 | Chromatiales | III | 0.06 |
| ASV\_000521 | Acidomicrobiales | II | 0.06 |
| ASV\_000990 | Flammeovirgaceae | II | 0.06 |
| ASV\_000898 | Piscirickettsiaceae | III | 0.06 |
| ASV\_000351 | Anaerolineae | II | 0.06 |
| ASV\_001010 | Piscirickettsiaceae | II | 0.06 |
| ASV\_000799 | Alteromonadales | III | 0.06 |
| ASV\_000874 | Deltaproteobacteria | II | 0.05 |
| ASV\_000716 | Desulfobulbaceae | II | 0.05 |
| ASV\_000533 | Sulfurimonas | IV | 0.05 |
| ASV\_000782 | Piscirickettsiaceae | III | 0.05 |
| ASV\_000499 | Desulfobulbaceae | IV | 0.05 |

1. Scotland

|  |  |  |  |
| --- | --- | --- | --- |
| ASV | Taxa name | Eco-group | Relative abundance |
| **ASV\_000008** | ***Psychrilyobacter*** | **IV** | **2.81** |
| **ASV\_000014** | **Helicobacteraceae** | **IV** | **1.53** |
| ASV\_000004 | Planococcaceae | III | 1.38 |
| ASV\_000003 | Alteromonadales | IV | 1.12 |
| ASV\_000013 | Helicobacteraceae | IV | 0.70 |
| ASV\_000017 | Bacillales | III | 0.67 |
| ASV\_000018 | Acidimicrobiales | IV | 0.62 |
| ASV\_000060 | Alteromonadales | IV | 0.47 |
| **ASV\_000079** | **Alteromonadales** | **IV** | **0.44** |
| **ASV\_000078** | **Helicobacteraceae** | **IV** | **0.43** |
| ASV\_000016 | Helicobacteraceae | IV | 0.40 |
| ASV\_000028 | Acidimicrobiales | III | 0.38 |
| **ASV\_000064** | ***Lutimonas*** | **IV** | **0.34** |
| ASV\_000026 | Acidimicrobiales | IV | 0.30 |
| ASV\_000053 | *Lutimonas* | IV | 0.30 |
| **ASV\_000067** | **Helicobacteraceae** | **IV** | **0.27** |
| ASV\_000092 | Actinomycetales | IV | 0.25 |
| ASV\_000051 | Helicobacteraceae | IV | 0.25 |
| ASV\_000023 | Helicobacteraceae | IV | 0.22 |
| ASV\_000059 | Desulfobulbaceae | IV | 0.21 |
| ASV\_000024 | Alteromonadales | IV | 0.21 |
| ASV\_000082 | Desulfobulbaceae | IV | 0.18 |
| ASV\_000087 | Helicobacteraceae | IV | 0.17 |
| ASV\_000096 | Helicobacteraceae | IV | 0.17 |
| ASV\_000175 | Desulfobulbaceae | IV | 0.17 |
| **ASV\_000154** | ***Lutimonas*** | **IV** | **0.17** |
| ASV\_000044 | Flavobacteriaceae | IV | 0.16 |
| ASV\_000050 | Helicobacteraceae | IV | 0.16 |
| **ASV\_000039** | **Bacteroidales** | **IV** | **0.15** |
| ASV\_000191 | Helicobacteraceae | IV | 0.12 |
| ASV\_000301 | Anaerolineae | IV | 0.12 |
| ASV\_000350 | Chromatiales | IV | 0.12 |
| ASV\_000091 | Desulfobacteraceae | IV | 0.10 |
| ASV\_000098 | Caldilineaceae | IV | 0.10 |
| ASV\_000066 | Caldilineaceae | IV | 0.10 |
| ASV\_000137 | Helicobacteraceae | III | 0.09 |
| **ASV\_000292** | ***Lutimonas*** | **IV** | **0.09** |
| ASV\_000239 | Helicobacteraceae | IV | 0.09 |
| ASV\_000038 | Thiohalorhabdales | IV | 0.09 |
| ASV\_000331 | Chromatiales | IV | 0.09 |
| ASV\_000090 | Thiohalorhabdales | III | 0.09 |
| **ASV\_000421** | ***Lutimonas*** | **IV** | **0.09** |
| ASV\_000127 | *Persicirhabdus* | IV | 0.09 |
| ASV\_000468 | Helicobacteraceae | IV | 0.09 |
| ASV\_000171 | Alteromonadales | IV | 0.08 |
| ASV\_000036 | Bacteroidales | IV | 0.08 |
| ASV\_000303 | *Lutimonas* | IV | 0.08 |
| ASV\_000031 | Myxococcales | III | 0.08 |
| ASV\_000485 | Helicobacteraceae | IV | 0.08 |
| ASV\_000215 | Desulfuromonadaceae | III | 0.08 |
| **ASV\_000107** | **Bacteroidales** | **IV** | **0.07** |
| ASV\_000473 | Helicobacteraceae | IV | 0.07 |
| ASV\_000356 | Myxococcales | II | 0.07 |
| ASV\_000122 | Flavobacteriaceae | III | 0.07 |
| ASV\_000110 | Unknown bacteria | III | 0.07 |
| ASV\_000401 | *Lutimonas* | V | 0.07 |
| ASV\_000415 | Flavobacteriaceae | IV | 0.06 |
| ASV\_000120 | *Lutimonas* | II | 0.06 |
| ASV\_000300 | Desulfobulbaceae | I | 0.06 |
| ASV\_000200 | Acidimicrobiales | III | 0.06 |
| ASV\_000262 | Desulfuromonadaceae | II | 0.06 |
| ASV\_000041 | Bacteroidales | IV | 0.06 |
| ASV\_000582 | Chromatiales | IV | 0.06 |
| ASV\_000781 | Chromatiales | IV | 0.06 |
| ASV\_000306 | Desulfobulbaceae | I | 0.06 |
| ASV\_000180 | Thiotrichaceae | IV | 0.05 |
| **ASV\_000114** | ***Desulfococcus*** | **II** | **0.05** |
| ASV\_000630 | Thiotrichales | IV | 0.05 |
| ASV\_000111 | Actinomycetales | IV | 0.05 |
| ASV\_000080 | *Desulfosarcina* | IV | 0.05 |
| ASV\_000566 | Chromatiales | III | 0.05 |
| ASV\_000168 | Bacteroidales | IV | 0.05 |
| ASV\_000641 | Flavobacteriaceae | IV | 0.05 |
| ASV\_000086 | Bacteroidales | IV | 0.05 |
| ASV\_000247 | Desulfobulbaceae | I | 0.05 |
| ASV\_000699 | Chromatiales | IV | 0.05 |
| ASV\_000412 | *Persicirhabdus* | IV | 0.05 |
| ASV\_000660 | Acidimicrobiales | IV | 0.04 |
| ASV\_000552 | Caldilineaceae | IV | 0.04 |