# Evaluating top-down, bottom-up, and environmental drivers of pelagic food web dynamics along an estuarine gradient

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## Supplemental data and model tables for Appendix S1

Table :Table S1. Variable definitions and temporal extent for the monthly and annual datasets.

| Variable | Monthly years (missing months) | Annual years (missing years) | Definition |
| --- | --- | --- | --- |
| Ammonia | 1995‒2020 (0) | 1980‒2020 (0) | from the Discrete Environmental Monitoring Program (EMP) at DWR - year-round |
| Amphipods catch | 1997‒2020 (18) | 1975‒2020 (1) | from 5 different sources - year-round - see Bashevkin et al. 2022 |
| Amphipods mass | 1997‒2020 (18) | 1975‒2020 (1) | from 5 different sources - year-round - see Bashevkin et al. 2022 |
| Centrarchids DJFMP | 1995‒2020 (3) |  | year-round - beach seines - biomass |
| Cladocera | 1995‒2020 (2) | 1975‒2020 (0) | from 5 different sources - year-round - see Bashevkin et al. 2022 |
| Cladocera catch | 1995‒2020 (2) | 1975‒2020 (0) | from 5 different sources - year-round - see Bashevkin et al. 2022 |
| Cladocera energy | 1995‒2020 (2) | 1975‒2020 (0) | from 5 different sources - year-round - see Bashevkin et al. 2022 |
| Corbicula | 1997‒2020 (18) | 1975‒2020 (1) | from the Environmental Monitoring Program (EMP) Benthic Survey at DWR - year-round |
| Delta smelt BSMT | 1995‒2020 (38) | 1980‒2020 (1) | year-round - midwater trawl - biomass |
| Delta smelt BSOT | 1995‒2020 (18) | 1980‒2020 (0) | year-round - otter trawl - biomass |
| Delta smelt FMWT |  | 1975‒2020 (1) | fall (September - December) - midwater trawl - biomass |
| Delta smelt STN |  | 1975‒2021 (0) | summer (June - August) - townet - biomass |
| Dissolved Inorganic Nitrogen | 1995‒2020 (0) |  | from the Discrete Environmental Monitoring Program (EMP) at DWR - year-round |
| Dissolved Orthophos | 1995‒2020 (0) | 1980‒2020 (0) | from the Discrete Environmental Monitoring Program (EMP) at DWR - year-round |
| Estuarine fishes BSMT | 1995‒2020 (38) | 1980‒2020 (1) | year-round - midwater trawl - biomass of estuarine pelagic forage fishes |
| Estuarine fishes BSOT | 1995‒2020 (18) | 1980‒2020 (0) | year-round - otter trawl - biomass of estuarine pelagic forage fishes |
| Estuarine fishes FMWT |  | 1975‒2020 (1) | fall (September - December) - midwater trawl - biomass of estuarine pelagic forage fishes |
| Estuarine fishes STN |  | 1975‒2021 (0) | summer (June - August) - townet - biomass of estuarine pelagic forage fishes |
| Flow | 1995‒2020 (0) | 1975‒2020 (0) | year-round - mean Delta outflow (water leaving the Delta to the Bay) |
| Herbivorous copepods | 1995‒2020 (2) | 1975‒2020 (0) | from 5 different sources - year-round - see Bashevkin et al. 2022 |
| Herbivorous copepods catch | 1995‒2020 (2) | 1975‒2020 (0) | from 5 different sources - year-round - see Bashevkin et al. 2022 |
| Herbivorous copepods energy | 1995‒2020 (2) | 1975‒2020 (0) | from 5 different sources - year-round - see Bashevkin et al. 2022 |
| Herbivorous zooplankton biomass | 1995‒2020 (2) | 1975‒2020 (0) | summed herbivorous zooplankton biomass |
| Herbivorous zooplankton energy | 1995‒2020 (2) | 1975‒2020 (0) | summed herbivorous zooplankton energy |
| Longfin smelt BSMT | 1995‒2020 (38) | 1980‒2020 (1) | year-round - midwater trawl - biomass |
| Longfin smelt BSOT | 1995‒2020 (18) | 1980‒2020 (0) | year-round - otter trawl - biomass |
| Longfin smelt FMWT |  | 1975‒2020 (1) | fall (September - December) - midwater trawl - biomass |
| Longfin smelt STN |  | 1975‒2021 (0) | summer (June - August) - townet - biomass |
| Marine fishes BSMT | 1995‒2020 (38) | 1980‒2020 (1) | year-round - midwater trawl - biomass |
| Marine fishes BSOT | 1995‒2020 (18) | 1980‒2020 (0) | year-round - otter trawl - biomass |
| Marine fishes FMWT |  | 1975‒2020 (1) | fall (September - December) - midwater trawl - biomass |
| Marine fishes STN |  | 1975‒2021 (0) | summer (June - August) - townet - biomass |
| Mississippi silverside DJFMP | 1995‒2020 (3) | 1976‒2020 (0) | year-round - beach seines - biomass |
| Mysids | 1995‒2020 (2) | 1975‒2020 (0) | from 5 different sources - year-round - see Bashevkin et al. 2022 |
| Mysids catch | 1995‒2020 (2) | 1975‒2020 (0) | from 5 different sources - year-round - see Bashevkin et al. 2022 |
| Mysids energy | 1995‒2020 (2) | 1975‒2020 (0) | from 5 different sources - year-round - see Bashevkin et al. 2022 |
| Nitrate and Nitrite | 1995‒2020 (0) | 1980‒2020 (0) | from the Discrete Environmental Monitoring Program (EMP) at DWR - year-round |
| Phytoplankton | 1995‒2020 (0) | 1980‒2020 (0) | from the Discrete Environmental Monitoring Program (EMP) at DWR - year-round |
| Potamocorbula | 1997‒2020 (18) | 1975‒2020 (1) | from the Environmental Monitoring Program (EMP) Benthic Survey at DWR - year-round |
| Predatory copepods | 1995‒2020 (2) | 1975‒2020 (0) | from 5 different sources - year-round - see Bashevkin et al. 2022 |
| Predatory copepods catch | 1995‒2020 (2) | 1975‒2020 (0) | from 5 different sources - year-round - see Bashevkin et al. 2022 |
| Predatory copepods energy | 1995‒2020 (2) | 1975‒2020 (0) | from 5 different sources - year-round - see Bashevkin et al. 2022 |
| Predatory zooplankton biomass | 1995‒2020 (2) | 1975‒2020 (0) | summed predatory zooplankton biomass |
| Predatory zooplankton energy | 1995‒2020 (2) | 1975‒2020 (0) | summed predatory zooplankton energy |
| Rotifers catch | 1995‒2020 (2) | 1975‒2020 (0) | from 5 different sources - year-round - see Bashevkin et al. 2022 |
| Rotifers energy | 1995‒2020 (2) | 1975‒2020 (0) | from 5 different sources - year-round - see Bashevkin et al. 2022 |
| Rotifers mass | 1995‒2020 (2) | 1975‒2020 (0) | from 5 different sources - year-round - see Bashevkin et al. 2022 |
| Secchi | 1995‒2020 (0) | 1980‒2020 (0) | from the Discrete Environmental Monitoring Program (EMP) at DWR - year-round |
| Striped bass age 1+ BSMT | 1995‒2020 (38) |  | year-round - midwater trawl - biomass of age 1+ individuals |
| Striped bass age 1+ BSOT | 1995‒2020 (18) |  | year-round - otter trawl - biomass of age 1+ individuals |
| Striped bass BSMT | 1995‒2020 (38) | 1980‒2020 (1) | year-round - midwater trawl - biomass of age 0 individuals |
| Striped bass BSOT | 1995‒2020 (18) | 1980‒2020 (0) | year-round - otter trawl - biomass of age 0 individuals |
| Striped bass FMWT |  | 1975‒2020 (1) | fall (September - December) - midwater trawl - biomass of age 0 individuals |
| Striped bass STN |  | 1975‒2021 (0) | summer (June - August) - townet - biomass of age 0 individuals |
| Temperature | 1995‒2020 (0) | 1980‒2020 (0) | from the Discrete Environmental Monitoring Program (EMP) at DWR - year-round |
| Total zooplankton biomass | 1995‒2020 (2) | 1975‒2020 (0) | summed zooplankton biomass |
| Total zooplankton energy | 1995‒2020 (2) | 1975‒2020 (0) | summed zooplankton energy |
| Turbidity | 1995‒2020 (0) | 1980‒2020 (0) | negative secchi depth |

Table :Table S2. Stations used to calculate input data for annual and monthly models.

| Survey | Temporal resolution | Stations |
| --- | --- | --- |
| Bay Study | Annual | 427, 428, 429, 431, 432, 433, 534, 535, 736, 837 |
| DJFMP | Annual | MS001N, SJ001S, SJ005N, SR012E, SR012E, SR014W, TM001N |
| EMP Benthic | Annual | D4-L, D7-C, D28A-L |
| EMP Nutrients | Annual | D26, D28A, D4, D6, D7, D8 |
| EMP Zoop | Annual | NZD28, NZ054, NZ074, NZ048, NZ086, NZ064, NZ060, NZ028, NZS42, NZ032 |
| FMWT | Annual | 338, 339, 401, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 501, 502, 503, 504, 505, 507, 508, 509, 510, 511, 512, 513, 515, 516, 517, 518, 519, 601, 602, 603, 604, 605, 606, 608, 701, 703, 704, 705, 706, 707, 708, 709, 710, 711, 802, 804, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 902, 904, 905, 906, 908, 915 |
| STN | Annual | 405, 411, 418, 501, 504, 508, 513, 519, 520, 602, 606, 609, 610, 704, 706, 707, 711, 801, 804, 809, 812, 815, 902, 906, 915 |
| Bay Study | Monthly | 317, 318, 319, 320, 321, 322, 323, 325, 427, 428, 429, 430, 431, 432, 433, 534, 535, 736, 837, 345, 346, 447, 750, 751, 752, 853, 760, 761, 863, 864, 865 |
| DJFMP | Monthly | SR014W, SR012E, MS001N, TM001N, SJ005N, SJ001S, OR003W, OR014W, SR012E |
| EMP Benthic | Monthly | D4-L, D6-R, D7-C, D16-L, D28A-L, D24-L, D41-C, D41A-C |
| EMP Nutrients | Monthly | D26, D28A, D4, D41, D6, D7, D8 |
| EMP Zoop | Monthly | NZD28, NZ054, NZ074, NZ048, NZD16, NZ086, NZ064, NZ060, NZ028, NZS42, NZ032, NZD41, NZD06 |