| | | DATABASES and OBSERVATIONS | | | | | | | | | | | | | | PREDICTIVE SYSTEMS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Model Inputs | | | | | Science | | | | | How Obtained | | | | Model Outputs | | | | | | | |
| **Physical Variables** | **FYR** | **P** | **W** | **C** | **M** | **S** | **P** | **W** | **C** | **M** | **S** | **Instruments** | **Platforms** | **Meas. Accuracy** | **Meas. Precision** | **P** | **W** | **C** | **M** | **S** | **R** | **Output Accuracy** | **Output Precision** |
| Water Temperature | 1 | I R | H I R | H I R | H I R | H I R | - | - | - | M | S | Model, CTD | Gliders, AUVs, Moorings, and Ships | AAAP | 0.1 deg C | I R | H I R | H I R | H I R | H I R | R | AAAP | 0.1 deg C |
| Air Temperature | 1 | | | | | | - | - | - | M | S | COAMPS | | AAAP | TBD deg C | - | - | - | - | - | - | AAAP | TBD deg C |
| SST | 1 | I R | H I R | H I R | H I R | H I R | P | W | C | M | S | AVHRR | Satellite, aircraft | AAAP | TBD deg C | I R | H I R | H I R | H I R | H I R | R | AAAP | TBD deg C |
| Salinity | 1 | I R | H I R | H I R | H I R | H I R | - | - | - | M | S | Model, CTD | Gliders, AUVs, Moorings, and Ships | AAAP | TBD PSS | I R | H I R | H I R | H I R | H I R | R | AAAP | TBD PSS |
| [u,v] | 1 | | H | H | H | H | - | - | - | M | S | Model | | AAAP | TBD cm/s | I R | H I R | H I R | H I R | H I R | R | AAAP | TBD cm/s |
| [w] | 1 | | H | H | H | H | - | - | - | M | S | Model | | AAAP | TBD cm/s | - | H | H | H I R | H I R | R | AAAP | TBD cm/s |
| Water Pressure | 1 | | | | | | - | - | - | M | S | | | AAAP | TBD | I R | H I R | H I R | H I R | H | - | AAAP | TBD |
| Barometric Pressure | 1 | | H | H | H | H | - | - | - | - | - | COAMPS | | AAAP | TBD | I R | H I R | H I R | H I R | H I R | - | AAAP | TBD |
| Density | 1 | | H | H | H | H | - | - | - | M | S | Model, CTD | Gliders, AUVs, Moorings, and Ships | AAAP | TBD g/cm^3 | I R | H I R | H I R | H I R | H I R | R | AAAP | TBD g/cm^3 |
| Winds | 1 | | H | H | H | H | - | - | - | M | S | COAMPS, QuickScat | Satellite | AAAP | 1 kt? | - | | I R | I R | I R | R | AAAP | 1 kt? |
| Currents | 1 | | H | H | H | H | | | | | | CODAR, ADCP | Moorings, AUVs | AAAP | 1 kt? | I R | I R | I R | I R | I R | R | AAAP | 1 kt? |
| Precipitation | 1 | | H | H | H | H | - | - | - | - | - | COAMPS | | AAAP | TBD | I R | I R | I R | I R | I R | R | AAAP | TBD |
| Cloud Cover | 1 | | H | H | H | H | - | - | - | - | - | COAMPS | | AAAP | TBD | I R | I R | I R | I R | I R | - | AAAP | TBD |
| Relative Humidity | 1 | | H | H | H | H | - | - | - | - | - | COAMPS | | AAAP | TBD | | | | | | - | AAAP | TBD |
| Injected Tracer Conc. | 2 | | | | | | - | - | - | - | S | | | AAAP | umole/l | - | - | - | - | H I R | R | AAAP | umole/l |
| Injected Tracer Flux | 2 | | | | | | - | - | - | - | S | | | AAAP | TBD | - | - | - | - | H I R | R | AAAP | TBD |
| Sea Level | 1 | | | | | | - | - | - | - | - | | | AAAP | TBD | | | | | | - | AAAP | TBD |
| Sediment Resuspension | 1 | | | | | | - | - | - | M | S | | | AAAP | TBD | | | | | | R | AAAP | TBD |
| Turbulent Mixing | 1 | | | | | | - | - | - | M | S | | | AAAP | TBD | | | | | | R | AAAP | TBD |
| Mixed Layer Depth | 1 | | H | H | H | H | - | - | - | M | S | | | AAAP | TBD | | | | | | R | AAAP | TBD |
| Sea Surface Height | 1 | | | | | | - | - | - | - | - | | | AAAP | TBD | - | - | - | - | - | - | AAAP | TBD |
| Bottom Topography | 1 | | H | H | H | H | - | - | - | M | S | | | AAAP | TBD | - | - | - | - | - | - | AAAP | TBD |
| Water Mass Tagging and Tracking | 1 | | | | | | - | - | - | M | S | | | AAAP | TBD | H I R | H I R | H I R | H I R | H I R | R | AAAP | TBD |
| **Ecosystem Variables** | | | | | | | | | | | | | | | | | | | | | | | |
| NO3 Conc. | 1 | | H | H | H | H | - | - | - | M | S | Temp model, water samples, ISUS | Gliders, AUVs, Moorings, and Ships | AAAP | TBD umole/l | I R | H I R | H I R | H I R | H I R | R | AAAP | TBD umole/l |
| NO3 Flux (succession vs. advect) | 1 | | H | H | H | H | - | - | - | - | - | | | AAAP | TBD | - | H | H I R | H I R | H I R | R | AAAP | TBD |
| NO3 Gradient | 1 | | H | H | H | H | - | - | - | - | - | | | AAAP | TBD | - | H | H I R | H I R | H I R | R | AAAP | TBD |
| NH4 Conc. | 1 | | H | H | H | H | - | - | - | M | S | SW | Ships | AAAP | TBD umole/l | - | H | H I R | H I R | H I R | R | AAAP | TBD umole/l |
| NH4 Flux (succession vs. advect) | 1 | | H | H | H | H | - | - | - | - | - | | | AAAP | TBD | - | H | H I R | H I R | H I R | R | AAAP | TBD |
| NH4 Gradient | 1 | | H | H | H | H | - | - | - | - | - | | | AAAP | TBD | - | H | H I R | H I R | H I R | R | AAAP | TBD |
| Chl Conc. | 1 | | H | H | H | H | P | W | C | M | S | Flurometer, SW | Satellites, Aircraft, Gliders, AUVs, Moorings, Ships. | AAAP | TBD umole/l | - | H | H I R | H I R | H I R | R | AAAP | TBD umole/l |
| Chl Flux (succession vs. advect) | 1 | | H | H | H | H | - | - | - | - | - | | | AAAP | TBD | - | H | H I R | H I R | H I R | R | AAAP | TBD |
| Chl Gradient | 1 | | H | H | H | H | - | - | - | - | - | | | AAAP | TBD | - | H | H I R | H I R | H I R | R | AAAP | TBD |
| CO2 Conc. | 1 | | | | | | - | - | - | M | S | ? See Gernot | Moorings, Drifters, Ships | AAAP | TBD umole/l | - | - | I R | I R | I R | R | AAAP | TBD umole/l |
| CO2 Flux (succession vs. advect) | 1 | | | | | | - | - | - | - | - | | | AAAP | TBD | - | - | I R | I R | I R | R | AAAP | TBD |
| CO2 Gradient | 1 | | | | | | - | - | - | - | - | | | AAAP | TBD | - | - | I R | I R | I R | R | AAAP | TBD |
| SiO4 Conc. | 1 | | | | | | - | - | - | M | S | SW | Ships | AAAP | TBD umole/l | - | - | - | I R | I R | R | AAAP | TBD umole/l |
| SiO4 Flux (succession vs. advect) | 1 | | | | | | - | - | - | - | - | | | AAAP | TBD | - | - | - | I R | I R | R | AAAP | TBD |
| SiO4 Gradient | 1 | | | | | | - | - | - | - | - | | | AAAP | TBD | - | - | - | I R | I R | R | AAAP | TBD |
| Fe Conc. | 1 | | | | | | - | - | - | M | S | ? See Ken | Ships | AAAP | TBD umole/l | - | - | - | I R | I R | R | AAAP | TBD umole/l |
| Fe Flux (succession vs. advect) | 1 | | | | | | - | - | - | - | - | | | AAAP | TBD | - | - | - | I R | I R | R | AAAP | TBD |
| Fe Gradient | 1 | | | | | | - | - | - | - | - | | | AAAP | TBD | - | - | - | I R | I R | R | AAAP | TBD |
| Irradiance - for heat flux | 1 | | H | H | H | H | P | W | C | M | S | HydroRad, TSRB | Moorings, Ships, TSRB | AAAP | TBD | | H | H | H I R | H I R | R | AAAP | TBD |
| Irradiance (PAR) | 1 | | H | H | H | H | P | W | C | M | S | HydroRad, TSRB | Moorings, Ships, TSRB | AAAP | TBD | | H | H | H I R | H I R | R | AAAP | TBD |
| optical backscatter | 1 | | | | | | - | - | - | M | S | Ecopuck, HS6, others? | Gliders, AUVs, Moorings, Drifters, Ships | AAAP | TBD | | | | I R | I R | R | AAAP | TBD |
| optical properties (a, b, bb, c, k) | 1 | | | | | | - | - | - | M | S | Ecopuck, ac-9, HS-2, HS-6, HydroRad, others? | Gliders, AUVs, Moorings, Drifters, Ships | AAAP | TBD | | | | I R | I R | R | AAAP | TBD |
| radiance - surface reflectance | 1 | | | | | | - | - | C | M | S | | Satellites, Aircraft | AAAP | TBD | | | | I R | I R | R | AAAP | TBD |
| P1, Small PhytoP Biomass | 1 | I R | H I R | H I R | H I R | H I R | - | - | - | M | S | SW, Plankton tows | Ships | AAAP | TBD | - | H | H I R | H I R | H I R | R | AAAP | TBD |
| P1, Small PhytoP Production | 1 | | | | | | - | - | - | - | - | | | AAAP | TBD | - | H | H I R | H I R | H I R | R | AAAP | TBD |
| P2, Large PhytoP Biomass | 1 | I R | I R | I R | I R | I R | - | - | - | M | S | SW, Plankton tows | Ships | AAAP | TBD | - | - | I R | I R | I R | R | AAAP | TBD |

| | | DATABASES and OBSERVATIONS | | | | | | | | | | | | | | PREDICTIVE SYSTEMS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Model Inputs | | | | | Science | | | | | How Obtained | | | | Model Outputs | | | | | | | |
| P2, Large PhytoP Production | 1 | | | | | | - | - | - | - | - | | | AAAP | TBD | - | - | I R | I R | I R | R | AAAP | TBD |
| heterotroph Biomass | 1 | I R | I R | I R | I R | I R | - | - | - | M | S | SW, Plankton tows | Ships | AAAP | TBD | - | - | - | I R | I R | R | AAAP | TBD |
| heterotroph Production | 1 | | | | | | - | - | - | M | S | | | AAAP | TBD | - | - | - | I R | I R | R | AAAP | TBD |
| autotrophs Biomass | 1 | I R | I R | I R | I R | I R | - | - | - | - | - | SW, Plankton tows | Ships | AAAP | TBD | - | - | - | I R | I R | R | AAAP | TBD |
| autotrophs Production | 1 | | | | | | - | - | - | - | - | | | AAAP | TBD | - | - | - | I R | I R | R | AAAP | TBD |
| Z1, Small ZooP Biomass | 1 | I R | H I R | H I R | H I R | H I R | - | - | - | M | S | SW, Plankton tows | Ships | AAAP | TBD | - | H | H | H I R | H I R | R | AAAP | TBD |
| Z1, Small ZooP Production | 1 | | H | H | H | H | - | - | - | - | - | | | AAAP | TBD | - | H | H | H I R | H I R | R | AAAP | TBD |
| Z2, Large ZooP Biomass | 1 | I R | I R | I R | I R | I R | - | - | - | M | S | SW, Plankton tows | Ships | AAAP | TBD | - | - | - | I R | I R | R | AAAP | TBD |
| Z2, Large ZooP Production | 1 | | | | | | - | - | - | - | - | | | AAAP | TBD | - | - | - | I R | I R | R | AAAP | TBD |
| Species Composition | 1 | | | | | | - | - | - | M | S | SW, Plankton tows | Ships | AAAP | TBD | - | - | - | I R | I R | R | AAAP | TBD |
| Biolum Species Composition | 1 | | | | | | - | - | - | M | S | SW, Plankton tows | Ships | AAAP | TBD | - | - | - | I R | I R | R | AAAP | TBD |
| Biolum Species Flux (succession vs. advect) | 1 | | | | | | - | - | - | - | - | | | AAAP | TBD | - | - | - | I R | I R | R | AAAP | TBD |
| Biolum Light Budget | 1 | | | | | | - | - | - | M | S | fluorescence and biolum sensors | Gliders | AAAP | TBD | - | - | - | I R | I R | R | AAAP | TBD |
| Grazing | 1 | | H | H | H | H | - | - | - | - | - | | | AAAP | TBD | - | H | H | H I R | H I R | R | AAAP | TBD |
| Particulate Organic Carbon Conc. | 1 | | | | | | - | - | - | M | S | Sediment Traps, Ships | Moorings | AAAP | TBD umoles/l | - | - | - | I R | I R | R | AAAP | TBD umoles/l |
| Dissolved Organic Carbon Conc. | 1 | | | | | | - | - | - | M | S | Sediment Traps, Ships | Moorings | AAAP | TBD umoles/l | - | - | - | I R | I R | R | AAAP | TBD umoles/l |
| Particulate Organic Nitrogen Conc. | 1 | | | | | | - | - | - | M | S | Sediment Traps | Moorings | AAAP | TBD umoles/l | - | - | - | I R | I R | R | AAAP | TBD umoles/l |
| Dissolved Organic Nitrogen Conc. | 1 | | | | | | - | - | - | M | S | Sediment Traps | Moorings | AAAP | TBD umoles/l | - | - | - | I R | I R | R | AAAP | TBD umoles/l |
| Bacteria Conc. | 1 | | H | H | H | H | - | - | - | M | S | Sediment Traps | Moorings | AAAP | TBD umoles/l | - | H | H | H I R | H I R | R | AAAP | TBD umoles/l |
| Particulate Flux | 1 | | | | | | - | - | - | M | S | Sediment Traps | Moorings | AAAP | TBD | - | - | - | I R | H R | R | AAAP | TBD |
| Detritus Si (Production/Rate)?? | 1 | | H | H | H | H | - | - | - | M | S | | | AAAP | TBD | - | H | H | H I R | H I R | R | | TBD |
| Detritus dn (Production/Rate)?? | 1 | | | | | | - | - | - | M | S | | | AAAP | TBD | - | H | H | H I R | H I R | R | | TBD |

## LEGEND

FYR=First Year Required (first year that a variable is to be measured or modeled): 1=2003, …, 5=2007
Where Measured: P = Pacific Basin, W=U.S. West Coast, C=California Coast, M=M Bay and Outer Waters, S=Science Operatations Area
Predictive System: H=HOPS, I=ICON, R=ROMS
AAAP=As Accurate As Possible
Column "R" under Model Outputs=Required for Science
Light Budget = Which organisms contribute what % to Bioluminescence Signal
Flux = either succession of species or advection. Future iterates of this table will need to be more specific. Modeling and Ecosystem Teams should discuss issues and resolve this.
Assumptions:
1) Entries in the Model Inputs column are strictly for measurements to serve the needs of the model. They may also apply to the Science Obs.
2) Entries in the Science Obs column are strictly for measurements to serve the service Science Obs needs. They may also apply to the Model
3) Entries in the Model Outputs column may serve both science and model skill assessment purposes.
4) Flux includes: Advection, uptake, remineralization, diffusion

## MODEL EXPLANATION

| Column Title | Explanation |
|---|---|
| Variables | Lists Physical and Ecsosystem variables that AOSN should model or measure |
| FYR | Stands for First Year Required. Based on assumption that AOSN is a 5 year effort. Enter a 1 in this column if the varialbe is to be addressed in 2003 (Project's 1st Year) |
| Model Inputs | Lists the inputs that are required by the Model/s if the Model/s are to provide the requested Model Outputs. This Column has not been reviewed by the Modeling Teams yet. |
| | The Modeling Teams should assume that all of these columns are currently blank. I have filled in some of the columns as an example only. |
| H I R | Indicates which Predictive System is needs the input. Maintain the order H I R to make this column easier to read. Enter 1, 2, or all 3 models as needed. |
| P, W, C, M, S | Describe the Model Nests (see legend above). We are currently using the ROMS Nest Definitions. This may change and may be defined independently for all models. |
| Science | These are additional measurements required to support Science only. They may not be provided as model output or they may be required in addition to model output to test |
| | model skill. |
| How Obtained | How is the data obtained |
| Instruments | The list of instruments that could be applied to measure the data. The Observation Systems Team will need to work this column. |
| Platforms | The list of platforms that could carry the instruments. The Observation Systems Team will need to work this column. |
| Measurement Accuracy | AAAP stands for As Accurate As Possible. We will likely not specify this any further for MB03. We will just assume it is sufficiently accurate or can be post compensated. |
| Measurement Precision | It will be important to get both the values and units for each of these worked out. All Teams should agree to the precision needed and our ability to achieve this precision. |
| | Nailing down the units we will use will help minimize communication and computational errors as we go forward and is therefore very important. |
| Model Outputs | Lists the Model Outputs needed either by the Ecosystem Team (this is marked by an R in the right most sub-column) or to test Model Skill. |
| P, W, C, M, S | Same use as for Model Inputs Column. The only difference is that use here indicates the nest were the model must provide output of the variable's value (vise input) |
| H I R | Same use as for Model Inputs Column. The only difference is that use here indicates the model that will provide the output for the specifc Nest. |
| Output Accuracy | Same as for Model Input Accuracy above. This time used to indicate output accuracy. |
| Output Precision | Same as for Model Input Precision above. This time used to indicate output precision. |