MEASUREMENTS OF BIOLOGICLAL PRODUCTIVITY
What is needed to do this from floats and gliders?

1. Primary productivity (PP)

*Phytoplankton net: light (z, λ), biomass (z, λ), biomass-specific pp coefficients, for models (where measures of biomass could be chlorophyll, optical backscattering, beam c, diffuse attenuation coefficient)
*Community net: dusk – dawn biomass

2. Net O_2 production (Net Community Production)

*Improved Accuracy of O2 sensor (for determining air-sea gradient)
        Performance characterization of sensor and drift
*Limitation--Gas transfer velocity as f(wind), uncertainty of +/- 30%
*Water-following floats may improve error of gas transfer
*Problem of bubbles – in situ measurements of gas tension & N_2 can
        correct

3. Production and export of particles (POC & PIC) & DOM
   (including remineralization and solubilization)

*Particle inventory measuremets: POC from beam c, optical backscattering and other optical sensors (LOPC, Bishop sensors)

*Flux measurements – optical sediment traps, deep optical spikes; multiple depths; how quantitative?

* Respiration rate measurements: ΔO_2 , CO_2, NO_3 changes with time (issues of uncoupled advection of surface and subsurface water masses)

* Limitation: Sensors for pH and DIC not presently ready

* Limitation: no in situ method for DOC

* Limitation: Role of diurnal vertical migrators – diel signal of midwater zooplankton/fish respiration

4. Short-term (less than a year) changes in Stoichiometry
      C:O$_2$:N:P:Chl

*Measurements of C or NO$_3$ change in euphotic zone and below
*Chlorophyll for changes in phytoplankton physiology

5. Issue of smart sampling, so can adjust sampling in response to changes (must have Iridium for two way communication)