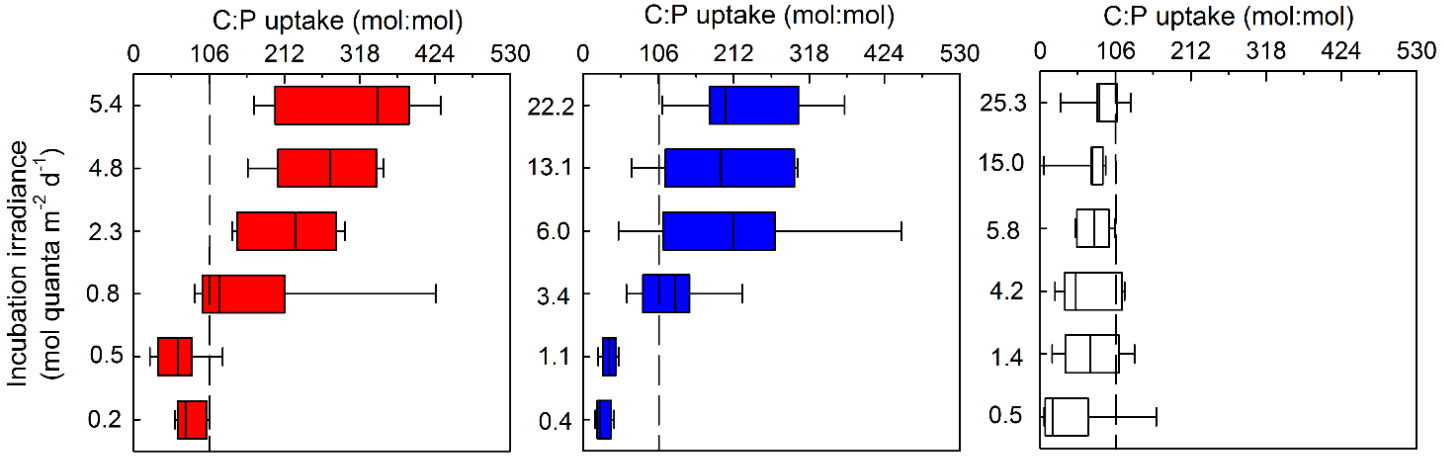
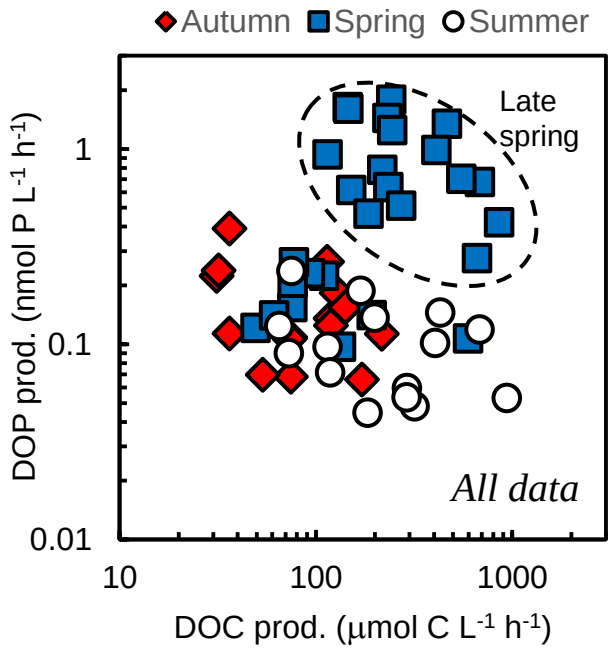
Stoichiometry of Phytoplankton Carbon to Phosphorus Uptake in a Shelf Sea from Spring to Fall





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Summary of C:P uptake stoichiometry

Autumn

- Light limited, slow phytoplankton growth and low bacterial growth efficiency
- Low P_i -uptake, high % DOP release (low affinity, poor retention)
- C:P uptake (81-188) generally similar to Redfield ratio (106:1)

Early spring

- Increasing light / stratification stimulates rapid phytoplankton growth
- High P_i -uptake, low % DOP release (high affinity & retention)
- C:P uptake (58-96) P-rich (*cf.* growth rate hypothesis): strong influence of phytoplankton on P-dynamics

Late spring

- Declining nutrients slows phytoplankton growth rates, low bacterial growth efficiency
- P_i -uptake remains high, but increasing % DOP release (high affinity, poor retention)
- C:P uptake (117-156) close to Redfield as bloom peaks and depletes nutrients

Summer

- Low (limiting) nutrients, slow phytoplankton growth, high bacterial growth efficiency
- P_i -uptake high (esp. biomass-normalised), very low % DOP release (high affinity & retention)
- C:P uptake (12-62) very P-rich, bacterial (cell C:P ~50?) dominance of P-dynamics