

- Reviewer #1

This revised manuscript shows clear improvement compared with the first manuscript, and the discussion has become much clearer. However, there are some faults probably caused in the process of revision. And I found the abstract did not sufficiently reflect the revision in discussion and conclusion. I proposed that these should be corrected before publication in Biogeosciences.

P3L11 “cells.mL-1” should be “cells mL-1”.

P3L16 “Hprok,” should be “Hprok.”

P3L18 In this abstract, the total revision in discussion is not fully included. I found some inconsistency between the abstract and conclusion.

P4L18 “by Church et al. (2002) and Karl et al. (2001)” should be “(Church et al., 2002; Karl et al., 2001)”.

P8L16 Remove “ml”.

P8L16 “+4°C” should be “4 °C”.

P10L14 and hereafter “per cell uptake” is inappropriate. “cellular uptake” or “cell-specific” uptake is more appropriate.

P10L21 “and data treatment” should be bold.

P11L11 Citation is inappropriate.

P13L1 This should appear in Materials and Methods?

P13L13  $\mu\text{g P}$  should be converted into  $\mu\text{gmol P}$ .

P13L20 “ $10^{-18} \text{ mol}$ ” means “amol”?

P14L7 “compared” should be “comparable”? Anyway, I could not catch the meaning of this sentence.

P14L13 “low” should be “short”?

P14L21 I could not understand this sentence. What is Taxon 1?

P15L7 Phosphorus is not oxidized when assimilated into organisms.

P17L17 “who” should be “which”.

P17L21 I could not understand this sentence. Why does it end with “such”?

Tables 1 and 2 “NA” is an abbreviation for “(data) not available”.

- Reviewer #2

The manuscript is much improved. However, there are remaining minor issues in the new text, listed below in order of appearance, that will need to be addressed prior to publication considerations. There also seems that text may be missing (p17).

P5, In 22. Insert “were” between ‘Pi’ and ‘higher’

P8, In 20. Were the blank values subtracted from the counts?

P11, In 15. Change ‘Table 2’ to ‘Table 1’

P12, In 9. Syn abundance - 7700 is less than 14000, so something is incorrect in this statement.

P14, In5-7. This sentence is difficult to understand. Does it mean that, at Station C, K +Sn were the same for all sorted groups?

P14, In 16. What is meant with “discrepancies’ between turnover time and SRP concentrations? What relationship was expected?

P15, In 3. These rates are quite high compared to these other studies, even when considering bulk rates measured previously in the Mediterranean (e.g. Flaten et al. 2005:  $\sim 1 \text{ nmol L}^{-1} \text{ h}^{-1}$ ).

P15, In 6. You present 4 possible reasons for the high per cell P uptake rates observed in Proc in this study compared to the Sargasso Sea ( $\sim 16\text{x}$  higher). However, it seems to me that these points address Proc rates compared to community rates. Is that what was meant? I also have questions with the different points.

Point i), although it is now realized that Proc group has great genetic variability, is there reason to believe that the Proc community in the Med is hugely different from that in other oligotrophic oceans?

Point ii) the proportion of Proc to the cyanobacterial community should not affect per cell rates, but bulk rates. Also, Pi (which here equates to orthophosphate) does not readily undergo redox changes, so 'oxidation of Pi' is probably not what you intended.

Point iii) this would require that if 100% of Proc is live in the Mediterranean then  $>90\%$  will be dead in the Sargasso Sea (15/16). Point iv) is valid but again requires that  $>90\%$  of the label is lost. Is there such a large discrepancy between sorted rates compared to bulk rates from the cited studies?

P15, In 16. If the missing fraction doesn't contribute much to the bulk P-uptake, then

even with higher per cell uptake they will not make up for the missing portion, as the comparison is between bulk and sorted cells, and bulk > sum of sorted groups.

P16, In 3. “Our data suggests that microbial communities have the potential to take up Pi faster when Pi turnover is short.” I am not sure what is meant here. Maybe the inverse (faster rates makes shorter turnover)? However, turnover time is a function of biomass, available P-pool size and community (or group) uptake rate. Your data from the top 50 m shows rates to increase with increasing SRP concentration, which is what would be expected where the Pi pool often is below concentrations where Vmax can be reached. So it may well be that at higher SRP concentrations the highest rates are achieved and the turnover times get shorter as a result.

P17, In 22. Is there missing text here? “..in stained samples: such..”