

First of all, we would like to thank referees 1 and 2 again for their time and constructive criticism. Below we have listed the comments and our responses in tabular form.

General comment on terminology (C1):

Apart from the changes we have highlighted in the table, we decided to adjust our terminology as the referees' comments made clear that it was still too clunky and led to misunderstandings, probably partly because of the terms used.

In order to reduce the complexity of our concept and improve the terminology, we have changed the following points:

- Deletion of sub-pattern and critical - these terms are not necessary. We have thus reduced the terminology
- Renamed **path segment to functional segment**
- Renamed **pathway pattern to structure**
- Renamed base **pathway concept to literature-based pathway concept**

In addition, we have streamlined the explanations in the text and reduced unnecessary additions to reduce the complexity of the manuscript.

Answers to referee 1:

Comment referee 1	Answer	New line in manuscript
Ln. 2: "of our time" -> "in oceanography"; this is secondary compared to other aspects of the Earth system's carbon cycle	We changed it to " one of the pressing tasks of our time".	2
Ln. 3: "investigated" - by who?; it should be clear whether or not this manuscript is meant here; for instance, you could write "... are typically investigated ..." since this makes it clear you're talking about the general situation rather than your specific one	We agree and change it to "are typically investigated".	3
Ln. 10: "scales" -> "distributions"?	We changed it to: In response, we propose a (visual) concept in which we define such higher-level 'structures' by comparing and condensing marine OC pathways based on their sequences of processes and the layers of the marine system in which they operate.	8-10

Table 1: “sub-pattern” - a somewhat confusing term	We agree and deleted the term in Table 1 and changed the sentences following also C1 to: A structure that comprises all pathways returning to the initial position is named closed loops. A structure that comprises all pathways not returning to the initial position is named 'open' loops.	Table 1
Ln. 235: but what do you mean by "superordinate" itself?	We changed the sentence to: Having defined the structures of remineralisation and rDOC loops, we now...	232
Ln. 282: “allochthonous” - I find that "external" and "internal" origin are maybe clearer than these jargon terms	We keep the terms, as allochthonous is not a jargon term but a technical term that describes rather the source of origin. External or internal might be misleading.	
Ln. 286: “indirectly” - Or is it directly? Mayor et al. suggest this may be a strategy ... doi: 10.1002/bies.201400100	We thank the reviewer for his comment and the interesting paper. We refrain from judging whether the processes are indirect or direct and changed the sentence to: Consumers reduce the size of organic POC by sloppy feeding on living and non-living POC by e.g. zooplankton coprorhexy (Lampitt et al., 1990), by producing small metabolites, by excreting DOC (Lampert, 1978) or by swimming or moving (Dilling and Alldredge, 2000).	279-282
Ln. 295-298: the double brackets in this paragraph are correct, but they're distracting!	We agree and changed the sentence to: In addition, bacteria can oxidise VOCs and CH ₄ as e.g. shown in Halsey et al. (2017) (D of VOCs/ CH ₄ in Figure 1). The VOCs and CH ₄ origin from abiotic processes such as photochemical degradation of DOC (Kieber et al., 1989) and biogenic processes, e.g. production by phytoplankton (Lenhart et al., 2016) and zooplankton in anaerobic areas of their guts (Weber et al., 2019; Schmale et al., 2018).	289-292

<p>Ln. 317: “recalcitrant” - this could be clearer; it's only seemingly "recalcitrant" because its concentration is too low for the relevant degrading organism to make a good living breaking it down; this is quite different from genuinely recalcitrant material that is bioengineered to be difficult to destroy (e.g. lignin, sporopollenin); spell this out to help your readers</p>	<p>We changed the sentence to: Furthermore, processes that convert living and non-living POC into DOC, e.g. dissolution, can dilute DOC to the point where it can no longer serve as sufficient nutrition for microbes and can be considered technically recalcitrant (Arrieta et al., 2015) (Figure 2, arrow from POC to rDOC).</p>	<p>313-315</p>
<p>Ln. 324: "of higher resolution" - > "with greater complexity"; "resolution" may carry some spatial context</p>	<p>We retain the term "resolution" because we do not think it has a general spatial connotation, since, for example, the resolution of photographs means that more pixels and thus more information are shown without any spatial context being associated with it.</p>	
<p>Ln. 329: “discussion” - would it make more sense to put the example in its own "results" (or "example") section or something?; and then use the discussion section to more distinctly discuss the framework</p>	<p>Although we understand the referee's point of view, we will not separate example and discussion because we have interwoven the two in the discussion and do not think we can reasonably separate one from the other. Especially since our discussion is mainly based on the example.</p>	
<p>Ln. 332-333: “embedded processes, pools, and agents” - these terms need to be clearly defined from the outset; "agents" is only formally defined in section 3.1, and then passingly in a bracketed clause; having something upfront about what is meant in each case would be helpful for some readers</p>	<p>Process is defined in Table 1. We added a definition for agents (organisms that initiate or execute a process) and pools (reservoirs of a certain substance- in this case organic carbon. Pools can be non-living and living).</p>	<p>Table 1</p>
<p>Ln. 334: “consistent terminology” - a consistent terminology would be good; the one here satisfies this, but its clunkiness may doom it</p>	<p>We agree with the referee that a uniform terminology is necessary, and we also see that our proposal is certainly only a first step towards finding this terminology but hopefully stimulates a discussion. However, we adapted our terminology to decrease complexity see C1.</p>	
<p>Ln. 337-341: brilliant!; this really helps - thanks!</p>	<p>We thank the referee for the comment.</p>	

Figure 3: an argument could be made for showing what the solubility pump looks like in your diagrams and/or terminology; admittedly (a) it's inorganic carbon, and (b) it'd be super-boring for sure compared to the biological pump, but in making this clear your system could demonstrate some value I think	Although we appreciate the ideas of referee 1 as they were very helpful for including the example of the biological pump in the first place, we will not include an additional example for the solubility pump. Mainly because of referee 1's argument that the manuscript is already complex and demanding. Adding another level would make the manuscript even longer and would - in our view - not add enough value to justify extending the manuscript.	
Ln. 345-346: "Missing further information, ..." - not sure what "missing further information" means here; expand or delete	We changed it to: As it is not clarified in the definition.	343
Figure 3: It would be difficult to make tidy, but I might be tempted to put titles on each of these panels; e.g. (a) is the "summary" or "overview", (b) is "resolved pools", (c) is "biological transport" and (d) is "physical transport"	We added: a) BCP as defined, b) Resolved pools c) Direct biota-induced transport and c) Physical processes.	Figure 3
Ln. 373: "sensu stricto" - more confusing Latin; expand for clarity; also, while there is something of a point about gravitational sinking not in itself being biological, and therefore arguably separate from the biological pump, I might be inclined to skip this here as it only adds confusion to an already difficult to follow manuscript.	Although we think that the question of whether sinking by gravity is part of the biological pump is an interesting point, we agree with the referee that this debate is not relevant to our discussion. We deleted the sentences.	
Ln. 397: "neglected" - is it "neglected" or is it simply viewed as "secondary" on a quantitative basis?; where a process is not considered important, it is often "neglected" in experiments or models for simplification	We agree and changed the sentence to: was considered quantitatively secondary and therefore neglected.	387
Ln. 609: "Theoceans" -> "The oceans"?	We adapted the reference.	602

Answers to referee 2:

Comment referee 2	Answer	New line in manuscript
p1.Ln 3 : Suggestion : ‘with sophisticated **tools and ** mainly **by** quantitative methods [...].’	We refrain from changing it, as this would not add value to the sentence, but prolong it.	
p1. Ln 6 : What are the significance of ‘core structure’ and ‘sub-concept’ ?	We changed it following C1 to: Such structures can provide a framework for the growing number of partly overlapping concepts, which conceptualise selected OC pathways, and promote more structured comparisons and consistent communication, especially between different disciplines.	6-8
p1. Ln 8 -10 : I suggest combining the two sentences such as e.g. ‘ In response, we propose a (visual) concept that defines pathway patterns who are defined by mapping, comparing...based on a consequent literature review’ .	We changed it following C1 to: In response, we propose a (visual) concept that defines such higher-level 'structures' ...	8-10
p1. Ln 10: To be consistent it should be a closed-loop ‘pathway’ as ‘patterns’ is used later for defining rDOC and remineralization. But as it is the abstract I suggest sticking to open and close loops only.	We changed it following C1 to: The resulting structures comprise 'closed loops', three remineralisation and two recalcitrant dissolved organic carbon loops that close in marine systems, and 'open loops',...	10-12
p1. Ln12 : As it is really technical in terms of vocabulary, every word used has a meaning, I suggest writing ‘loops’ instead of ‘basic structures’.	We agree and changed it to: In addition, we provide a synthesis of embedded processes, OC pools, and process-executing organisms (agents) embedded in these loops.	12-13
p1. Ln13: I suggest adding ‘carbon’ before ‘pools’ and I am not sure of the meaning behind ‘agent’ at this stage.	Pools and agents are now additionally defined in Table 1. We also changed it to: In addition, we provide a synthesis of embedded processes, OC pools, and process-executing organisms (agents) embedded in these loops.	Table 1
p1. Ln 15 : Do we want to stay large and talk to OC cycle, or do we want to specify ‘marine OC cycle’ in this explanation ?	We added marine in all cases where we do not refer to the overall carbon cycle.	16
p1. Ln 16: As before: What is the significance/definition of ‘core structure’ ?	We deleted ‘core’.	17
p1. In 17 : Are we sure ‘basic’ is needed here (and in the following sentence). I suggest reducing the wording as much as possible to avoid confusion.	Changed to ,structures’ following C1.	

<p>p1.Ln 22 : Suggestion : ‘..OC dynamics **along them** is an essential and **relevant** focus on ocean research.’ Instead of ‘OC dynamics resulting from the multiplicity of these pathways and the human influence on them is an essential and very productive focus of ocean research’. As I am not sure the human influence is the main topic of this paper, and as I do not see how a focus can be productive.</p>	<p>We agree that the human influence is not our key point and shorten the sentence. However, we do not adapt the "along the pathways" as we argue that these dynamics are among others influenced by the interplay of pathways. This information would be lost. We change it to: Therefore, understanding marine OC pathways and the current and future marine OC dynamics resulting from the multiplicity of these pathways is an essential and very productive focus of ocean research.</p>	22-23
<p>p1. Ln 24-27 : I am not sure I understand the sentence. Is it the comprehensive observations and the sophisticated numerical models who improved the carbon budgets ? Maybe consider a rephrasing of the sentence.</p>	<p>We change it to: Comprehensive observations and sophisticated numerical models, e.g. by the Joint Global Ocean Flux Study..., improved carbon budgets... and quantitative estimates of the contribution of individual organisms ..., to name but a few, are continuously expanding our understanding of OC pathways and the marine OC cycle.</p>	23-25
<p>p2. Ln 29 : At this stage the definition of higher-level structures, core mechanisms is not intuitive. I suggest sticking with what will be used after (Pathways and sequence of processes).</p>	<p>We do not use our terminology in this sentence, because we are not describing what we use or define here, but paraphrasing what other publications have used and done. However, we shortened the sentence to: ...generalise OC pathways as a sequence of processes or a core mechanism.</p>	29
<p>p2. Ln 29 - 31 : Suggestion : ‘ ..of the OC cycle, the studies focus only on the description of pathways related to the interest of the research’. Instead of ‘... OC cycle, these concepts have a relatively narrow focus and consider a selection of pathways.’</p>	<p>We changed it to: ...the OC cycle, these concepts only consider a selection of pathways related to the respective research focus.</p>	30-31
<p>p2 . Ln 31-34 : Similarly as comment for p1. Ln 24-27 , the utilization and referencing of the example make it hard to understand. Is it an enumeration, or one sentence only ? Maybe consider a rephrasing of the sentence.</p>	<p>We changed it to: For example, some studies conceptualise and generalise pathway structures for specific carbon pools e.g. dissolved OC in the microbial pump ..., for a selection of species such as bacteria in the microbial loop ... or for physical processes of different scales e.g. large-scale or eddy-subduction export ...</p>	31-34

p2. Ln 43 : Suggestion : 'useful' instead of 'plausible' ?	Changed it to: plausible and useful.	43
p2. Ln 48 : Why do we have 'graphics' twice in the sentence ?	Changed it to: within the respective graphics or compared to schemata in other publications	48
p2. Ln 50 - 53 : Suggestion : ' For example, Steinberg and Landry (2017), Cavan et al. (2019), Anderson and Ducklow (2001) and Boscolo-Galazzo et al. (2018), while aiming to represent the same pathways do not use the same visual representation leading to inconsistencies. As the aim of such studies is not to create congruent conceptual representations of the OC cycle, their visualizations are still useful tools to highlight their research focus in an overarching picture. '	We changed it to:... visually detach processes from their products, such as DIC, or do not mention some products in the figures at all. As the aim of such studies is not to create congruent conceptual representations of the marine OC cycle, their visualizations are still useful tools to highlight their research focus in an overarching picture. Although we understand the referee's point, we cannot change the 2 sentences as suggested as the first suggested sentence would imply that there are only inconsistencies when comparing figures but our argument is that there are inconsistencies within single figures too.	50-52
p2. Ln 57 : Suggestion : ' Non-congruent graphics within the scientific literature to represent a same concept do not exploit the full potential'	We refrain from changing the sentence. As we argue that it is not only incongruence within different figures but also within one figure. The suggested sentence would be misleading.	
p2. Ln 58 : Do we want to stay large and talk to OC cycle, or do we want to specify 'marine OC cycle' in this explanation ?	Changed it to: marine.	58
p3. Ln 65 : Do we want to stay large and talk to OC cycle, or do we want to specify 'marine OC cycle' in this explanation ?	Changed it to: the marine OC cycle	65
p3. Ln 68 : I suggest removing core to avoid confusion on the definition associated with 'core similarity' that may not be clear at that stage of the manuscript.	We removed 'core'.	66
p3. Ln 73 : Do we want to stay large and talk to OC cycle, or do we want to specify 'marine OC cycle' in this explanation ?	We changed it to: marine.	67
p3. Ln 71-75 : I really appreciate this paragraph. It is well structured and gets straight to the objectives of this study. It is a nice addition to the first version of the manuscript.	We thank referee 2.	

p3. Ln77and 78, 79 : I suggest removing core to avoid confusion on the definition associate with 'core similarity' that may not be clear at that stage of the manuscript.	We removed 'core'.	77,78,79
Space : To highlight that you are considering 'Atmosphère', 'Ocean' and 'Sediment' I suggest to list all your 5 spaces in the example column. Suggestion : Atmosphere Space (AS), Ocean spaces (e.g. Surface layer space (SLS) and Water column space (WCS)) ; Sediment spaces (e.g. Upper (USS) and Lower (LSS) sediment spaces). '	While we see the referee's point, we have intentionally included only the spaces associated with the three example pathways at the top of the table. To emphasise that we are only providing examples connected to pathways 1-3, we change the heading to: 'Term' 'Definition' 'Examples based on pathways 1-3'	Table 1
Initial position : Suggestion for the Example column, to use the same wording : .. in the ** Surface Layer Space** instead of surface space.	Agreed and changed.	Table 1
For me the terms 'pool' , even intuitive, should be described as well as agent (not as intuitive) that you use several times in the abstract and Introduction.	We agree. Both are now included in Table 1.	Table 1
My understanding is that 'pathway patterns' and 'sub-patterns' are the same thing. I suggest removing the 'sub-pattern' wording here and in the following text to avoid any confusion in the wording.	We agree and change the sentence following C1 to: A structure that comprises all pathways returning to the initial position is named closed loops. A structure that comprises all pathways not returning to the initial position is named 'open' loops.	Table 1
I do not think the first line of the table with the Mapped example pathways in the base pathway concept is informative, it leads more to confusion in my point of view.	We have included these pathway examples intentionally to show how we have moved from single pathways with processes to structures with sequences of functional segments (see C1). We hope that by changing the heading to "Examples based on pathways 1-3" we have made the connection clearer. As we have noticed that the distinction between the terms still seems to be partly misleading, we change it according to C1. We will keep the pathways 1-3 on top of the table in any case, as they show what a pathway is and how a pathway merges into structure.	
p4. Ln 114-115 : This sentence is not useful or can be merged with the first one.	We changed it to: To this end, we generate a literature-based pathway concept (see Supplement A) by collecting and mapping the different pathways that an OC compound can	112-114

	"go" within the marine OC cycle based on a non-systematic literature review.	
p4. Ln 115-116 : Maybe you can try to have a logical order when listing the spaces : up to down (Atmosphere - surface - sediment) or down to up (sediment - surface - atmosphere) .	We restructured the sentence to highlight that the pathways either return or leave: The individual pathways in this concept are defined by sequences of processes (Table 1), such as sinking and remineralisation, and either return to the initial position in the surface water or leave the marine system to the sediment or the atmosphere.	114-116
p4. Ln 117 - 118 : This sentence is really hard to understand as a lot of things are mentioned with no clear definition or point of difference : 'base pathway', 'mapped pathways', 'core structures', 'core patterns of OC pathways'. It is really hard to get the nuance among the notions. Maybe the 'base' pathway concept can be named as 'litterature-based-pathway-concept', 'mapped pathways' which are the ones you are describing can be named simply 'OC pathways', and I do not get the sense and distinction of core structures/patterns.	We changed the sentence to: We compare the OC pathways in the literature-based pathway concept and condense their similarities into generally applicable structures. In addition, we changed the name of the base pathway concept to literature-based pathway concept.	116-117
p6. Ln 123 : Following my previous comment, you can use the appropriate appellation ' To explain how to compare and condensed litterature-based-pathway-concept and define'	Changed it to: To explain how the pathways of the literature-based pathway concept can be compared and condensed to define structures of the marine OC cycle, we...	120-121
p6. Ln 123 : Once more, what is the 'core patterns' meaning ?	We deleted it here.	123
p6. Ln 140 : I do not get the meaning of the 'entire-city-beach route'. Following your explanation it should be named ' harbor front beach route' otherwise I do not get why the harbor front beach route is a subordinate of the entire-city-beach route' as it is the same thing.. ?	We thank referee 2 for this question. We adapted the description and explanation as it was indeed partly misleading.	120 and following paragraphs
p6 Ln 144 : Please be consistent in the wording. What route is referring to here ? Path segments or Pathway patterns ?	We changed it to: One could for example also distinguish other structures based on the method of crossing the lagoon or find further differences and commonalities between the pathways in the rest of the city and define additional structures.	146-148
p6. Ln123-147 : From the explanation you provide, I drew a schematic (Schematic 1). But it seems that the term 'pathways' is not properly placed in my schematic.	We thank referee 2 for the schematic and the time invested into the review. We adapted our terminology (C1) and	120 and following paragraphs

Maybe it is my understanding wrong, or maybe something is misleading in the explanation. I'll let you have a second look on the text to be sure.	streamlined the explanations throughout the text.	
p8. Ln188 : For consistency with my comment about Table 1. 'sub-patterns' should be replaced by 'pathways'.	Deleted sub-pattern- see C1. A clarification: A pathway is always an individual sequence of processes. Example: Pathway 1: travel to the port via road A and take the public ferry. It can also be described as a sequence of functional segments if we transfer the processes to their general function. For example: Pathway 1: get to the harbour and cross the lagoon. A structure is always a condensation of several pathways. Different structures (of different hierarchical order) can be defined depending on the resolution of details. For example, the rDOC loops belong to the structure closed loops. Or in the analogy, the " behind the harbour front beach" structure belongs to the "the entire city beach" structure.	
p8. Ln 221 : At the end of the sentence, Are we sure the wording is sub-pathway patterns and not 'pathway patterns' ?	We changed it to: However, users of the concept can identify and combine other functional segments to define different higher-resolution structures.	223-224
p9. Ln 229 : for consistency it should be 'pathways' and not 'sub-patterns' (See comment on Table 1).	Changed to: We define four structures of 'open' loops.	226
p7. Ln 160 : As you already said in Sect 2 this, I recommend using wording such as ' As previously mentioned, the path segments...' .	We slimmed down the paragraph. As a result, the relevant passage has been omitted.	163 ff.
p10 Ln235 to p16 Ln 330 : For consistency with the italic used to characterize pathway and path segments, can we place the processes in italic in the text too ?	We do not put the processes in italics because we do not define them, but only compile them.	
p12 Ln. 253 : 'A of (r) DOC in 2)' . Does the '2' refer to Fig.2 ?	Indeed. We changed it to: A of (r)DOC in Figure 2	250
p15 Ln. 287 : I suggest the reading of this paper to add a reference here :Goldthwait, S., Yen, J., Brown, J., and Alldredge, A.: Quantification of marine snow fragmentation by swimming euphausiids, Limnol. Oceanogr., 49, 940–952, https://doi.org/10.4319/lo.2004.49.4.0940 , 2004	We did as recommended.	281

<p>p15 Ln. 294 : The wording here may be misleading. 'sub-patterns' should be pathways, and POC-DOC remineralisation 'sub-loops' ?</p>	<p>A higher-level structure, comprises several levels of lower-level structures. For example, closed loops are the most superordinate structure in the marine OC cycle. rDOC and remineralisation loops belong to these closed loops. The POC-DOC remineralisation loop belongs to the remineralisation loops and closed loops. The more details are included and the higher the resolution, the more the structure resembles the individual pathways up to the point where a pathway is described rather than a structure. We adapted the description following C1.</p>	
<p>p16 Ln. 325 : Instead of sub-pattern, shouldn't it be 'sub-loop' ? (See my schematic 2).</p>	<p>Changes were made following C1.</p>	
<p>p16 Ln.327 and 329 : Does the term 'sub-patterns' refer here to the pathways or to the sub-loops previously mentioned and called-sub-patterns before ?</p>	<p>Changes were made following C1.</p>	
<p>p16 Ln. 330 : Does the term 'patterns' refer here to pathway patterns, or the previous term sub-patterns that are confusing (see previous comment) ?</p>	<p>Changes were made following C1.</p>	
<p>For consistency it should be 'pathways' and not 'sub-patterns' (See comment on Table 1) in the</p>	<p>Changes were made following C1.</p>	
<p>Table 2 : Uniformize the term 'sub-pattern/Pathways' (See previous comments on that point).</p>	<p>Changes were made following C1.</p>	
<p>Table 3 : It is a great improvement of the first table 3 proposed in the first version, congratulations !</p>	<p>We thank referee 2 for this comment.</p>	
<p>May I suggest to remove the repetition of the column names (Process, loop syntax, etc.) for each Path segment. The reader may refer to the first one if s/he needs a reminder. Therefore I suggest to place the column names above the first path segments to be clear these names apply for the entire long-table.</p>	<p>While we understand the referee's point of view, we tested this version in the first review round and it did not improve readability. Certainly, the table becomes shorter this way, but from our point of view at the expense of clarity.</p>	
<p>I am wondering if we do not have the same information twice with Fig 2 and Table 3 ? Do we want to keep both, or do we want to choose one of them ? Just a thought</p>	<p>We think that the table adds additional and relevant information and thus keep both.</p>	

<p>Entire discussion : To avoid the repetition of the main reference Giering and Humphrey 2020, maybe in the second paragraph of the discussion you can make a statement that mentions that in the following analysis the description of BCP used as reference is based on Giering and Humphrey 2020 ? With this statement the reader will know that further assumption will refer to their work and you would not have to mention it in every paragraph ?</p>	<p>We thank the referee for this very helpful comment. We decreased the repetition of the reference and added a footnote saying: If not mentioned differently, we always refer to the BCP definition by ... in the following discussion.</p>	<p>336</p>
<p>p17 Ln 342 : This sentence is a repetition of the previous paragraph. It should be reswamp if you want to keep the information that relates with your example (F [SLS]).</p>	<p>We changed it to: Using the syntax of our concept, the defined BCP involves the uptake of inorganic carbon into biomass in the surface waters (F [SLS]) and the OC position change to the interior of the ocean (A [Ocean Interior]), where it is remineralised to DIC (D [Ocean interior]) (Figure 3 panel (a)).</p>	<p>340-342</p>
<p>p17 Ln 351 and 352, 353, 357, 358 , 360: As mentioned before, sub-patterns should be removed and sub-loop should be used (See my schematic 2).</p>	<p>Changes were made following C1.</p>	
<p>p17 Ln 354 and 358 : Does 'loop' refer to the sub-loop ? If yes please use consistent wording.</p>	<p>Changes were made following C1.</p>	
<p>p17 Ln346 to 363 : It is not really clear when reading the text and having the Figure 3 under the eyes how the number of loops is determined. In p17 Ln. 348 It is mentioned 'to close the loop' inducing that there is one loop in the panel (a) is misleading of what it is stated at p17 Ln 354 when ' only two loops of the superordinate loops of panels (a)'. Is it possible to have the number of loops associated with the pathway patterns mentioned in the Figure 3 legend ? Similarly, the loops are not easy to see on the Figure pannels, and when the author refers in the text to seven loops or six loops form panels (c) and (d) it is misleading with the numbering of pathway patterns mentioned in the Figure. I suggest either talking only of pathway patterns numbers in the text to fit with the legend of the Figure, or to switch the legend of the figure with the numbering of loops to fit with the text.</p>	<p>We agree that it was partly hard to follow the comparison of the numbers and thus now directly address the numbers of the pathways in figure 3. In addition, we shortened the paragraph following also a comment by referee 1.</p>	<p>346-358</p>

Figure 3: The space (SLS) and (WCS) can be placed once on the left side of the figure.	We changed it accordingly.	Figure 3
Figure 3: The term 'Processes' can be placed in bold above biota-induced and physical	Following comments of referee 1, we added: a) BCP as defined, b) Resolved pools c) Direct biota-induced transport and c) Physical processes** as titles for the panels.	Figure 3
Figure 3: The term 'loops' can be placed in bold above the various loops specified	As loop is only a name of a structure and we want to have it more inclusive (plus the original definition of the BCP misses the path segment E to form a loop), we use structure instead of loops.	
Supplement B, In the box 6, as Pathway pattern abbreviation has already been described in box 4 you can either use the full wording or the abbreviation only but not both, it is confusing.	We changed it accordingly and also adapted the description a bit to account for C1.	
Editorial/Typo comments :		
p8 Ln 189 : Do not use italic for and between the two sub-patterns/pathways.	Changed accordingly.	186
p10. Ln 232 : Do not use italic for and between the two sub-patterns/pathways.	Changed accordingly.	226 ff.
Legend Figure 1 : "loop" when talking about srDOCL and LrDOCL shouldn't be plural ?	We checked the legend but couldn't find a mismatch.	
Legend Table 2 : "loop" when talking about srDOCL and LrDOCL shouldn't be plural ?	We checked the legend but couldn't find a mismatch.	
p12 Ln. 249 : Even if it is the beginning of the sentence, I suggest to force the r of (R)DOC to be in lowercase.	We changed it as recommended.	246
p12 Ln 253 : The path segment A should be placed in parenthesis.	We put the letters in parenthesis only after writing out the functional segment. E.g. 'remineralisation of OC (D) is involved in' versus 'functional segment D is involved in...'	
p12 Ln 258 : The path segments A and E should be placed in parenthesis.	same as above	
p12 Ln259 + all the manuscript+Figures/Tables : Shouldn't be '(r) DOC' instead of rDOC ? Maybe I am confusing the meaning, but please review all the manuscripts and supplementary material if the wording with and without parenthesis means the same thing. If not please mention somewhere the difference between the two ways of writing it.	We checked the manuscript and added that (r)DOC means a process is valid for (DOC and rDOC).	246
p12 Ln 267 : The path segment A should be placed in parenthesis.	same as before	
p12 Ln 272-273 : The path segments A and E should be placed in parenthesis.	same as before	

p12 Ln 277 : The path segment D should be placed in parenthesis.	same as before	
p15 Ln 281 : The path segment D should be placed in parenthesis.	same as before	
p16 Ln 303 : The path segment D should be placed in parenthesis.	same as before	
p17 Ln 348 : The path segment E should be placed in parenthesis.	same as before	
p17 Ln 351 and 354 : The path segment E should be placed in parenthesis.	same as before	
Figure 3 :		
- I wonder if the figure 3 would be better if seen as landscape instead of portrait within the page ?	Since the figure placing is usually decided by the technical editor, we have not changed the orientation at this point in time.	
p19 Ln385 : The path segment E should be placed in parenthesis.	same as before	
Supplement:		
First Review the arrow legends, as some are placed below the arrows and are sometime difficult to read (e.g. Coastal in the sediment part 'Consumed macrophytes' below the black arrow) ;	First of all, we would like to thank referee 2 for taking so much time and reviewing the supplement. We have tried to take some of the feedback into account, but as it is a supplement we have not been able to take all the referees' comments into account. We have corrected spelling errors where we found them and changed some of the label placements.	
Some of the text are missing space between words (e.g. Coastal 'Carnivoresand detritivores')	Regarding the questions about why we do not use boxes for bacteria, viruses and faecal pellets: We use boxes for bacteria and viruses. Faecal pellets go into the POC pool. The arrows with bacteria, viruses and faecal pellets indicate that there can be a change in position between pools of different water layers. We distinguish between benthic carnivores and benthos that are not carnivores.	
Some of the arrow descriptions are similar, maybe you can manage to have the same infos placed where the arrows merge ? (e.g. Coastal, Sinking of resting stages).		
Why don't you use boxes for Faecal pellets, bacteria and Virus ?		
As you refer to 'benthic carnivores', what imply 'Benthos' ?		
Why only referring to mammals ? You may refer to the upper trophic levels to be as general as possible ?	Since we include carnivorous fish, mammals are the only group of higher trophic levels left from our point of view.	
- Shouldn't 'Pahotrophy' be Phagotrophy ?		
Physical Transport is written numerous times (with some typo (Physical)), but it is already linked to blue arrows that are mentioned in the legend as physical-induced, so maybe there is no need to write it down ?	We retain physical transport, although we agree that it is very often included. However, we feel that the size of the concept does not really allow us to delete information, as it would take time to find the information elsewhere.	
- Does 'Autigenic' shouldn't be Authigenic ?		

<p>Is it possible to have this huge diagramm 'interactive' ? Is it possible to have in the legend the SLRL loop display for example, and when someone click on it is only the SLRL arrows and boxes and infos that appear for a better visualization?</p>	<p>The concept is partly interactive in the sense that it shows the references and short descriptions when you scroll over the arrows. However, we think that implementing an interactive level as suggested by reviewer 2 would be great. However, this was not within the scope and time frame of our project.</p>	
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