Dear Dr. Ferreol Salomon,

Thanks for submitting to geomorphology. After peer review, it is to inform that your MS is not recommended to publish in our journal in present form, but some revision between moderate-major ones, requested by our anonymous reviewers (seeing the comments appended below for your references, also please see an annoated PDF attached with this message). Please note although both reviewers found somehow interesting and relevancies to our communities, they are also questioning MS significance especially reviewer #2 who asked relation to the paper by Salomon et al. 2024. This is important for you to make it very clear, and probably you should shorten some lines if some were also introduced in previous publication, or make it stronger between them if needed. Reviewer #1 suggested to shorten some lines of discussion, which is inappropriately to fit paper structure. Please note, there are also many questions and queries requested by the reviewers, and you should read them carefully when revision. While resubmission, a letter of reply be prepared in which all comments be rebutted at point-point level whatever agreeing or disagreeing, which will help reassess the improvement of quality of science of your MS via our peer review processes.

Dear Editor

Thank you for your synthesis andthe acceptance of the paper with major revision. We followed carefully the suggestions of the two reviewers. Please see below.

Kind regards,

The authors

Reviewer #1: Comments on GEOMOR-13713
The paper by Salomon et al. reports a study that compiles a time-series of old maps and satellite images to reconstruct the temporal changes in the coastal geomorphology of the Francolí delta, the Mediterranean coast of Spain, which documents interesting interaction between natural and human-induced processes. This paper initially intends to show and apply a methodology to judge the validity of the georeferencing the spatial information used and then argues the processes that are identified in the delta in a context of the global economic trends. I would declare that I am not able to criticize the methodology section, but found the topic is interesting and within the scope of Geomorphology. Overall, the author's opinions are clearly written, and I fully agree with them. However, too many lines appear to be spent to reiterate their opinions, which I felt a bit overwhelming. Thus I would encourage authors to shorten the discussion. Below is the list of minor points I found. The manuscript is clearly written but contains many errors in grammar that greatly benefit from a thorough English editing service.

Thank you very much for your interest in this paper and your comments. We modified the discussion to reduce the repeats.

L48: 'later to a wave dominated delta': I seem to miss relevant argument with this in the main text.

Sentence deleted
L181: Please follow the journal's style of citation.

Paragraph deleted
L417: split, not splitted.

Corrected
L433: Each panel of Figure 6 is too small to see. should split into several figures.

TO DO

L437-8: Directions shown appear opposite. Ocean waves from southwest, and river sediment input fro northeast. Please check.

Corrected: (1) waves from the south east and north-east and (2) sedimentation from the Francolí river.

L439: constraint, not constrains

Corrected.
L611-2: Again, from the southwest? No ocean in the northeast.

Corrected: Their first aim was to stop the influence of the waves and storms coming from the south-east and the north-east

Reviewer #2: Dear Author(s)

I have reviewed your manuscript on Tarragona Harbour and the Francoli river mouth with interest and sympathy. I regard it a very good methodologically interdisciplinary work between human geography and physical geography, covering the evolution a good-sized harbour that became as big as the delta on which it sat in a process of 2-3 centuries. Study of such systems is important for engineering, sustainability, hydraulic functioning and heritage understanding. I regard the scientific contribution of the paper to be:
(i) strong and convincing case presentation for Tarragona harbour growth and its influence on nearby Francoli river, with well documented connection between spatial and historical developments, culminating in a meaningful periodization
(ii) general methodological presentation of how to treat youngest time urban-delta-harbour evolution.
(iii) novel aspects of using the time-depth of georeferencing control point datasets as a temporal proxy for intensity of urban/port change.

You will find many comments (many redactional suggestions, some of them longer scientific reflections) in the PDF of the manuscript.

Thank you really much for you interest in this paper and all your very thoughtfull remarks that improved a lot the paper.

My main suggestions are:
1. I noticed the manuscript is presented as 'paper 2' in a series, and paper 1 is the recently published Salomon et al. 2024 study. In the best prepared parts of the manuscripts, that paper is referenced, elsewhere it is 'paper 1'. There appears to have been somewhat of a search in what element of the study to give what attention in paper 1 and paper 2 - not so much in Method and Results, but more so in Abstract, Intro and Discussion. I have used some PDF comments to make suggest on how to keep paper 2 independent from paper 1 in framing and highlighting (allowing for cross-reference where it regards data and case results and topical referencing).
Following you suggestions we made it clear the difference between the two papers (the papers were initially thought to be published in the same issue and this did not fit with the new publications format).

2. Be more clear in your use of long-term in the text (incl. abstract and highlights). Sometimes it means last 3000 years. Sometimes it means last 300 years. Sometimes it means projected to the future.
Regarding 'the future': I think you dropped an expose on reverting developments in the future from the main text, but your highlights and abstract still had a section on that in it). I advice to keep such a section out.
It was a last minite addition, not very thoughtfull, we agree. We removed it. We then clarified the term long-term.

Organisation of the manuscript can improve further in the following aspects

3. Abstract
- line 35-36 contains a bold statement on would be 'classical' (traditional) geomorphological attitudes to studying deltas. I think it is overstated (see comment in PDF). I recommend to rephrase this sentence:
I suggest to highlight the difference in temporal scope and primary data, when studying natural to anthropofied morphodynamic transitions, rather than stereotyping natural delta research. That is also the contrast between this 'paper 2' and your earlier 'paper 1', I reckon.
- see PDF for further comments.

To DO
See below for answers to the pdf comments.

4. Introduction
4a Order of presentation of arguments and aims can improve:
- line 128 is the 2nd paragraph of the introduction and it starts declaring the studies goals. I think it comes a little to early, and further down in the Introduction text, I found myself advising 'move this up, to before declaring the aims'.
- The introduction should introduce the Tarragona case and circumstances at general level, and Section 2 than provides further context and setting.
4b The way the Tarragona case is introduced (after the aims paragraph) is currently mixed with general statements (that would help to be read before the study aims were declared)
- Some aspects of the Tarragona specific introduction may be saved for in Section 2 or in Section 4.
- see PDF for further comments.

We followed you advices and moved paragraphs and sentences within introduction and with other sections.

See below for answers to the pdf comments.

5. Geographical and Historical context
- good section, does not need an introduction paragraph but can start straight away with river details
- shorten the long subheading 2.2
- see PDF for further comments.

Introduction paragraph was removed.

See below for answers to the pdf comments.

6. Methodology
6a Evacuate technical detail on Georeferencing quality control to a technical supplement
- this goes for line 322-327 (end of Section 3.2)
- this goes for section 3.3 from line 328-364, including Figure 3 and 4.
- keep line 364-375 in the main text as the end of Section 3.2
6b Rework the collection of Annual Reports of the Port of Tarragona into a reference to use repeatedly in Section 2 and Section 4.
- see PDF for further comments.

We removed part of the georeferencing part to put it in the supplmentary mmaterial. We only kept a part regarding the way referencing points were tracked back in time.

Introduction paragraph was removed.

See below for answers to the pdf comments.

7. Results
7a The Results section contains elements that are not directly your new data compilation, but more general statements that would be better off to make in Section 2.
- This goes for line 437-440
- see PDF for further comments.

Modified according to the suggestions.

See below for answers to the pdf comments.

8. Discussion Section 5.1
8a Discussion section 5.1 on periodization, contains elements that are directly your new data compilation, and would be better off treated as a result and placed in Section 4.1/4.2
8b The Periodization outcome itself (Section 5.1), I also regard a result of the study, Hence I advice to rename Section 5.1 into Section 4.3 and let the Discussion begin with what is now Section 5.2
8c Section 5.1 also contains sentences that can simply go (repeat, redundancy with Section 4)
8d Keep the description of the Periodization result focuses on the spatial configuration, for each period description.
- see PDF for further comments on Section 5.1.
We moved the periodisation part to the analysis.

See below for answers to the pdf comments.
9. Discussion Section 5.2
9a Section 5.2.1: good section - see PDF for comments
9b Section 5.2.2: good section - see PDF for comments
9c Section 5.2.3: good section
- Avoid overlap regarding Roman time (and Medieval time) lost heritage and sedimentary record with 'paper 1'.

- Do not discuss the Roman evidence (not your data here, not your timeframe either, just a Tarragona particularity), but briefly include it in Sections 2 and Section 4 factual presentations. Rather, make the dredging of the last centuries the explicit subject in this Discussion section.
9d Section 5.2.4: good section

We removed references to the Roman period to only focus on the heritage

- see PDF for comments
See below for answers to the pdf comments.

10. Discussion Section 5.3
10a Section 5.3.1: This section needs a rewrite to keep paper 1 and paper 2 'related but independent'.
- the easiest way to do it is remove lines 819-829 all together.

We followed the advice.
10b Section 5.3.1 from line 830 onwards: good section.
10c Section 5.3.2: second part of subheader too long and too pretentious

True, we removed it.
10d Consider swapping 5.3.2 and 5.3.1 in order of presentation.

We swapped the parts. Thank you.
- see PDF for comments
See below for answers to the pdf comments.

11. Conclusion
- see PDF for comments
See below for answers to the pdf comments.

12. FIGURE CAPTIONS
- generally very nice figures
- generally good captions, but see PDF comments. [ I reordered pages in the reviewers-provided-PDF to have caption and figures closer together, and figures 11 and 12 to appear last in order ]
- Some figures have a caption both in the figure and in the caption text.
12a Figure 3 and 4: see above. Good figures but too technical and underpinning overall quality, but not the critical data that underpins the main message.
12b consider portrait layout for the multipanel map-histogram pair figures.
12c Figure 12 is not used a lot in the text.
- Consider to simplify a little bit by making steps 3 and 4 one step (less = more).

TO DO

**PDF COMMENTS FROM REVIEWER 1 REPORTED HERE with answers :**

I recommend to simplify the title and include the georgraphical name of the site (Tarragona, Francoli delta, Spain). e.g. The morphodynamic trajectory of the urbanised Francoli delta (Tarragona, Spain): an exemplary plurisecular hybrid geomorphic reconstruction challenge

>>> ???

This is not made true in the paper.

>>> Yes, true, modified: « Elaboration of a systematic methodology for disentangling interlocked chronologies. »

Graphical abstract : This graphic abstract is an extra figure not in main text. Good cover for a thesis, but not a good graphical abstract in my opinion.

>>> Modified to integrate better the methodological concept of « interlocked methodologies »

l. 33 « not grasped in traditional natural » and « the trajectory of shifting balance »

>>>  modified

l. 35-36 This is a bit too strong statement. There are multiple traditions, each with their own domain. It triggers me to formulate this general comment on portraying modern delta geomorphic research.

1. Human affected states have also been specifically researched by geomorphologists, but then usually based on surveying and monitoring morphological change ('local dynamics') , and with shorter temporal domain (that covered by historic and modern maps) In contrast, natural states tend to be researched over longer temporal domain, and based on deposits and landform observations (i.e. other types of data). Both studies use 'upstream and climatic factors' (and downstream factors like wave, tide, sea-level change, I would add). I recommend to rephrase this sentence highlighting the difference in temporal scope and primary data, when studying natural to anthropofied morphodynamic transitions, rather than stereotyping natural delta research. See also my remark in line 127 of the main text: you yourself have earlier published a multi-millennial study primarily based on different datasets than the ones you present foremost in this paper....

2. It is true that In these last studies, subrecent antropogenic impact is treated 'as a given' (can be read from map) and 'as an overprint'). This is not 'classic', but is 'traditional'.

3. Arguably, natural delta studying has more indirect application (it is an analogue case for understanding water or hydrocarbon reservoirs somewhere else, it provides an analogue case for understanding long-term future natural delta behaviour, it provides generic input to shallow geological mapping which then can be used by engineers, hydrologists, archeologist, ..., it provides generic insight in how delta systems function, it provides baseline values to measure antropogenic influence against) - and human delta studying has more direct application (it maps and quantifies the system as it functions today, it helps short-term future development prediction, it serves the delta system management directly (sediment management, eco- and pollution management, navigability management).

>>>  sentence removed

l. 38 « It advocates to separately consider »

>>>  modified

l. 41 and 42 « an outer harbour » and « in modern harbour basins » and « intensified »

>>>  modified

l. 44-45 « The reconstruction goes back to Roman times, and the estuarine transformation takes place during the 19th and 20th century, linked to economic globalisation and associated ship size increases.. »

>>>  modified

l. 46-48 the main text of the paper does not contain sections on this

>>>  removed

l. 103 « It appears that 1 Introduction had been updated to Salomon et al. 2024 multi-millennial paper acceptance - but

2 Geographical and Historical context had not been updated (it contains reference to a 'paper 1' that seems to be Salomon et al. 2024).

>>>  corrected

l. 106 « plains »

>>>  modified

l. 109 « ??? database et al. ??? »

>>>  corrected, Bolt and van Zanden, 2020

l. 113 coastal systems?

river mouth systems?

Just 'coasts' is a bit vague. What is a coast?

A line on a map? Coast line position has been affected by engineering intervention and resource extraction -- with land use intensification, urbanisation, industrialisation as drivers and pollution as a coevally varying metric.

A general concept? it was a coast before, it still is a coast, coasts as a concept have not changed fundamentally.

>>>  modified in « river mouths systems »

l. 115-119 « You highlight large issues of Intereset Conflict and Future uncertainity here, and present that as the relevance of your study.

You skip other issues here: (1) the Feedbacks between Engineering alteration (harbour expansion) and maintenance (dredging) and morphodynamic system behaviour; (2) the drive to monitor the waters in and around the harbour by economic activity itself (the data that delta studies world wide base themselves on are mainly there because of the economic activity; originally collected to maintain and expand business as usual past developments, also deployable in studies exploring future developments). »

>>>  modified : « Issues are raised regarding feedbacks between engineering alteration (harbour expansion), maintenance (dredging) and morphodynamic system behaviour as well as the drive to monitor the waters in and around the harbour by economic activity itself. »

l. 120-122 : what do you mean? Location wise? System interaction wise? And « and systematic approach » and « multi-century trajectories of harbour infrastructure development, »

>>> Modified : This study aims to bring a more standardised methodological framework and systematic approach to the subject of reconstructing multi-centuries trajectories of harbour infrastructure development in relation to fluvio-coastal systems.

l. 122-123 : « The method incorporates various kinds of data sources to reconstruct and collate river, coast and harbour geographical and bathymetric changes over time. »

>>> Modified accordingly

l. 124 : 1) Reorder this from most heavy used to lighter used in this study. They are in my judgement:

18-21st cy historical geographical and economic information (modern surveys, old maps); local archaeological and sedimentological data (historic river, coast and harbour); multi-faceted contextual data (economical, political, hydro-climatological).

2) Also don't use 'versus' as you are not independently comparing them, but integrating them as supplementary information allowing to go further back/forward in time than when using just one resource.

>>> Modified accordingly

l. 126 Advice: move this statement to Discussion ("save it for there").

The point of "systematic approach" you can move to line 121, it goes for both the geomorphological and the transdisciplinary aspects connecting to social sciences and port/harbour economics.

If you want to signal the level of transdisciplinarity in the approach of the study, then improve the presentation in lines 116-119 (see my comment there).

>>> Moved

l. 127 multi-millennial pluri-millennial as a word I associate with parallel timelines of long-term future modelling, not with reconstruction. 1) How far back did this go exactly? Common Era? then say Common Era. 2) Is mentioning the longer term study relevant for the present study? if so: add why. If not: use a more subtle location to indicate that you also have a paper that goes further back in time (and that apparently STOPPED in the youngest centuries, which in you abstract you portrayed as 'classic' and essentially unwanted....

>>> Sentence removed

l. 135 : Tarragona introduction begins here. Consider to make separate (sub)section: Tarragona harbour case. line 136-140 = specific introduction Tarragona case.

Perhaps connect this equally to the physical setting of the Tarragona harbour, and the contents of the Salomon et al. 2024 paper (e.g.: in Roman times it was an export harbour)

>>> Thank you for all the suggestion to reorganise. We moved the different parts but we didnt create a subsection.

l. 141-142 : Roman aspect of Tarragona as harbour highlighted. Is it really the first paper ever?

No, it was your first paper on it. "Our earlier paper" also: That it is freshly succesfully published -- congratulations! -- is not needed to say in this paper: it is clear from the reference, and from you citing it.

>> Corrected : They tried to improve the harbour potential with built infrastructure, but we do not know how long it remained safe for ships.

l. 147-148 : Has there not been any Archeological study touching this in a discussion paragraph before>

Is it a question of '100 years or 200 years'?

Is it a question of '200 years or 500 years'?

Is it a question of Classic only vs. also Post-Classic use?

Is it a question of 'what is efficient'??

You come back on the roman harbour-onset situation in Figure 11

>> Corrected

l. 147-148 the structure of this sentence leaves unclear if you mean:

- there was sometimes erosion from storms 'in the harbour', or

- during storms sediment eroded outside the harbour got trapped inside the harbour.

>>> Corrected : Sedimentary cores drilled in the ancient harbour basin showed that it has always been prone to either quick sedimentation in the harbour during the floods of the Francolí and quick erosion in the harbour during storms

l. 148 : Do you have reference for this statement? Consider: (references in Salomon et al., 2024) if you don't want to over-reference the present paper.

>>> Modified

l. 156 : Do you have references for this statement? [ at this place it could be modern environmental monitoring report references ]

>>> Added : (Galofré et al., 2018).

Line 157-168 is great background section on harbour morphological models.

It occurs a bit hidden in the text. Consider to move it to higher up in the text, to before where you introduce the AIM of your paper. (integrating harbour morphology classifcatio with sedimentary fluvial-coastal morphological classification)

>>> We moved it higher

l. 164 traditionally

>>> Corrected

l. 169 here the text falls back to introducing Tarragona specific case

>>> Moved

l. 180 : Move header up. Get rid of most of the opening paragraph

>>> Removed

l. 186 Have more, and more informative, headers. line 186: Francoli river discharge ; line 200: Harbour hydraulics

>>> Modified

l. 187 Good flood series information is available for the youngest two centuries.Avoid negative framings.

>>> Modified

l. 200 : say this earlier, e.g. near line 180.

>>> Moved

l. 210 : This heading is too long. Consider: Tarragona city and harbour history

>>> Modified

l. 214 It had been a little in Roman times, but during Middle Ages was no longer. Refer back to Salomon et al. 2024 for this.

>>> Modified

l. 217 : "Nearby Reus was the city that saw population growth and concentration of economic activities"

>>> Modified

l. 232 « a port city of importance »

>>> Modified

l. 234 « the facing sector of the city wall. (correct? much of Tarragona's city wall is still standing I recall) «

>>> We were more precise speaking about the lower city

l. 235 « by »

>>> Modified

l. 261-269 Not needed to repeat.If you want: use these sentences as openers in the Discussion

>>> Removed

l. 289 « We made further use of all data gathered in »

>>> Modified

l. 291 Advice: Unless you want to present a technical methodological study (you did NOT announce that in Introduction, it was more an interdisciplinary study) - just say what you did and do not overcomplicate with 'hypothesis testing'.

>>> Modified

l. 322-375 good detailed information and georeferencing discussion - but consider to move it all to the Supplementary material (including Figure 3 and 4) to keep the main text method section smaller.

This section is very detailed. Not needed in the main text - unless you want to rewrite the paper as a methodological study (I advise against that).

I advice to move most of this section (Line 328-365) together with Figure 3 and 4 and the discussion in line 322-326 - all to a longer Supplementary Information text documenting the georeferencing.

Lines 365-375 may be kept in the main text (see remark there).

Don't get me wrong: I appreciate the the quality and effort demonstrates - but for the appreciation of the overall text and message - it is to technical-detailed and interruptive. It harms the main message of the paper to keep it in this excessively.

>> Thank you. This is true. However, we only moved half of the georeferencinfg discussion to the supplmeentary material. We consider some parts are essential to this study.

l. 377 « The georeferenced dataset contains »

>>> Modified

l. 422-428 - I would remove this as a Method section.

Instead, mention this in Chapter 2.2 as one of the references.

>>> Moved higher

l. 437 Move this sentence to the Introduction or to Section 2.

It is a general statement based on general geomorphic understanding (we fear extreme discharge and wave) and historic context (we new Tarragona had a functioning harbour before this study started).

Here it interupts your listing of results.

>>> Moved to the Discussion

l. 442. was it a Roman mole? Earlier it is said it is an Medieval 15th cy mole?? or were there two moles?? one roman and one 15th cy? [it appears to be this case]

This is the first mention of the Roman mole.

I guess paper 1 / Salomon et al. 2024 has more mention of it.

If you present the Roman mole location in this section as a reference location, it should have been mentioned in the text leading up to it, e.g. Section 2 or as one of the reference points for the oldest maps in Section 3.

>>> We added a mention of the Roman jetty in section 2.2.

l. 443 what kind of feature is this in general terms? A dam? A breakwater?

>>> This is a « mole ». Added to the text

L444, « from 200 m originally to ca. 1000 m length eventually. »

>>> Corrected

L451 onwards : « Doubled » don't mix tenses in one sentence. Use past tense throughout here in this historic description. Use present tense when you move to giving explanations and system functioning descriptions.

>>> Corrected

L 570 Darsena. Along this channel lay…

>>> Corrected

L575 Darsena

>>> Corrected

l. 585 too long title. Suggestion: Periodisation of Harbour development trajectory

>>> Corrected : Periodisation of hybrid urban delta trajectory

l. 587 This is a good sentence that could have been given in 1 Introduction or 2 Geographical and Historical context. It is not needed as a repeat and re-introduction here, in my opinion.

>>>> Moved to the introduction

l. 592. - I would say: from the 1400s to the 1800s.Don't make your argumentation in this paper too dependent of the Salomon et al., 2024 paper. Don't have an 'open beginning' for period 1.

>>>> Modified

l. 592 don't cite this as part of the subheading, but use a regular location in the running text to cross reference.

>>>>Removed and reference added in the text

L593 to 592 : This to me reads as repeat of section 4.2, to delete

>>> We only removed a part of this paragraoph. We kept the part that synthesised the configuration of the harbour in 1790’s

l 596 I recommend to use the first sentence for every Period to portray "harbour and natural river mouth" during that moment.. Do not mix specifics of inheritance of previous situation with it [it is clear from the position in the paper that things inherit, and from the contents of the earlier Results section 4.2]

>> We followed the advice in changin the beginning of each section

L 599 semi-cyclic

>>>> Modified

l. 599 unclear in what way they are involved:Are they the driving force with a residual component that is what is called the long-term trend? [ Possible. Often the viewpoint of river flux/river mouth/delta-estuary geologists/geomorphologist and hydraulic modellers]

Or are they an independent process that overprints and hides the other wise more smoothly operating longshore drift process [ Possible too, often the viewpoint of marine coastal geologists/geomorphologists and oceangraphic modellers. If that is the case, why would longshore drift show a long term trend? in what direction? slowly increasing? slowly decreasing ???]

do you mean: (1) during the long-term time that deltas were mostly natural -- or (2) also on the long-term in the future (given all the further developments in Period 2-4 which hugely altered the system further, you claim).

I think you mean only (1), but your wording is NOT explicit and the reader may read long-term also as including (2).

>>>> Modified : « These semi-cyclic fluvio-coastal dynamics together with longshore drift are involved in long-term deltaic trends with low anthropogenic impacts.”

l. 601 to 608 : This information is dropped casually here, but was not really in the paper before.

It needs reference here, and it needs to have been mentioned to exist earlier.

- I reckon Salomon et al. 2024 probably published on this, so that is your reference then.

- In section 2 could have already mentioned it, with on-land geological-geomorphological mapping of the lower river reaches and archaeology of Tarragona city, and written history, it provides indeed information on the centuries before 1800 - but it is not 'Results' in this paper, and it has been 'Generated and Discussed' in the Salomon et al. 2024 paper.

>>>> Paragreph deleted

l. 611 Do you have a reference for this? Is it frequently mentioned in the harbour reports??

>> TO ADD

l. 612-621 This is good historical background detail, supporting geomorphological 'hybrid' morphodynamic rationale.

I wonder if this information could not have been blended with lines 508-515 in Result section 4.2.

>> We prefer to keep this part here, since we connect the data generated by our analysis in 4.1 and 4.2 to historical data

L622 to 628 - Consider to move line 622-626 to the beginning of the Period 2 description. Delete 626-628

>> We moved lines 622-626

L613 >> Add storm records to figure 9-10

 >> TO ADD

L 629-630 : major changes to the harbour infrastructure

>> Modified

l. 634 You may want to state slightly more strongly, that Period 3 was really "the first period where regular dredging became a strategy in operating the harbour".

>> yes this is true. Thank you. Added.

l. 636-638 : This I read as unnecessary repeat of section 4.2

>> yes, deleted

l. 641-654 : This is also largely repeat of Section 4.2.

>> paragraph partly removed

l. 655 : Is the active river still a delta in this stage? No, you will call it estuary later.

Better then to call it Francoli channel or Francoli river mouth.

The delta of the Francoli river is incorporated in urban Tarragona, not in Tarragona harbour .

>>> Modified

l. 665 is committed to be dredged regularly

>>> Good thoughts, thank you. Modified

l. 670 Can you also give information where the dredged material is brought to? What is it used for? or is it not usable (poluted) and dumped further offshore??? or in some special basin?

>> TO ADD

l. 658 to 675 : many part repeat Section 4.2.

>> paragraph partly removed

l. 676 : I would start the Discussion with this paragraph

>>> Very good idea. Modified

l. 678 « that is outcome of the analysis concisely describes the geographical evolutionary trajectory of »

>>> Modified

l. 689 « and harbour bathymetric quality »

>>> Modified

l. 693 « generational sets of maps stretching back in time »

>>> Added

l. 695 « , that in themselves also provide a proxy metric for »

>> sentences modified

l. 699 This is nice, strong methodological finding in this paper, fairly novel (to me).

>> Thank you very much

l. 706 do you have supporting information on it, from occassional mention in historical annual harbour reports? E.g. quotes in the line of:

"This year, we are happy, as we could update the harbour bathymetry", "This year, we notice it is five years ago since we last updated the bathymetry and ships are increasingly reporting shallow water/fathoming problems".

>> This is not clearly mentioned like this. We propose this based on the dataset in Figure 2 (considering periods before 1970, we collected all the maps with bathimetric mentions)

l. 708 datapoint spacing? Meaningfull interpolation grid-size?? one data point every xx meters?

this is not the vertical error.

>> XXX

l. 756 « Rise of the modern port, heritage loss and dredging gain »

>>> Title changed

l. 759-763 this section can be moved and blended with information in section 4.2

>>> We prefer to keep this part here to link two important part of this paper, dredging and heritage.

l. 766 : it says early 1980ies in Figure 11. Either here or there a typo exists.

>>> Thank you, corrected

l. 771 : the truly modern port? or the late 19th/early 20th cy port? You pose this as if this was a strange descision, but the harbour evidence was erased ca. 100 years before the Upper city of Tarragona was put on the World Heritage list.

>>> Corrected. You are right this is history, we modified the text.

l. 772-773 : It is European directive to do this since the Valetta 1992 treatment, implemented since the 2000s. Implementation and quality of execution is up to local and regional government.

I agree that alignment of the geotechnical and geoarcheological activities is important for success and for efficiency, and to prevents purposely and limit accidental unrecorded removal of subsurface and subharbour heritage

>>> Thank you very much for the information.

l. 789 Please provide some references to this.

>>> TO DO

l. 800 double check. 1890s was meant I think? or 1970s?

>>> No, this was correct, the 1990’s

L802and 803 originally (Periods 1 and 2) were main contributors

>>> True. Modified.

l. 806 Maybe include a statement here that this in not unique to your case, but actually seen in many harbourified systems.

>> Text modified

l. 810-813 This reads as a loose statement. Is it a fact? then state it in section 4.3/5.1 and not repeat it, unless you want to discuss what it means.

>> Paragraph deleted

l. 815 « long-term in the past? in the future? or both? what do you mean with long-term perspective? »

>>> In the past, Corrected

l. 815-823 Just delete lines 815-823 and start with this sentence.

>>> Yes, we deleted. Thank you.

l. 825 « At slightly more zoomed-out scales, for the landscapes hosting these harbours, ... »

>>> Modified accordingly

l. 830 « Without dedicated and systematic attention (Salomon et al., 2024 + this paper) »

>>> Modified

l. 832 « need to be supplemented to the .. »

>>> Modified

l. 835 « temporal input »

>>> Modified

l. 837 « The Taragona case »

>>> Modified

l. 852 « paper (and also Salomon et al. 2024: their figs. 10+11). » and « provide them new »

>>> Modified

l. 860 consider to flip the order of 5.3.1 and 5.3.2

first 'delta vs. estuary'

(which makes a good point, but is not super exciting: more on definition/naming)

last 'hybrid urban delta'

(which makes a good point too, that is a better last point to make, also connecting to 'paper 1').

>>> True, section moved

l. 860 I would not state this, it is too pretentious in a title/header. Mention it in a sentence in the running text. My thoughts: One needs a review of many harbours based on cases such as this one to establish a delta-scale morphological typology.

At harbour scale you cited reviews earlier, but the harbour has become as big (or wide or long) as the delta system that hosted it,

>>> True, suppressed

l. 874-881 move this section to line 815-817: it is not on delta vs estuary, but on the entire concept of hybrid urban delta

>>> Paragraph moved

l. 896 work bridges between

>>> Modified

l. 899 call it "interlocked chronologies approach" like you did in Figure 12.

>>> Modified

l. 902 « Our results and discussion highlight the following » and « of conducting studies » and « over centuries: »

>>> Modified

l. 916 Maybe remove the bullet in front of this one: this is a sentence that goes beyond single case study -- all the others apply to single case studies.

>>> Modified

l. 920 emplaced

>>> Modified