



# Review Report

**Gaitan & Adam, Kinematics and Dynamics of Multi-stage Salt Diapirs in the Dutch-Central Graben, Southern North Sea, TEKTONIKA, 2025.**

## Table of Contents

<i>1<sup>st</sup> Round of Revisions</i> .....	2
Decision Letter.....	2
Comments by Reviewer 1 and Authors' Reply .....	3
Comments by Reviewer 2 and Authors' Reply .....	17
<i>Authors' Letter</i> .....	31
<i>Acceptance Letter</i> .....	32

## 1<sup>st</sup> Round of Revisions

### Decision Letter

The recommendation regarding the submission to *tektonika*, "Kinematics and dynamics of multi-stage salt diapirs in the Dutch-Central Graben, Southern North Sea" is:

Both reviewers have found that the manuscript includes some interesting, detailed analysis of the long-lived evolution of diapiric structures in the North Sea and provides a good effort in defining their triggers and driving mechanisms through time. The figures are also of overall great quality. However, they also recognized major issues with the text and paper structure, including several grammatical errors and incomplete/confusing sentences, and a few smaller issues with the interpretations and discussion, which I agree. This will require major revisions, mostly involving rewriting and reorganization of the text, in particular of the results and discussion sections to increase its clarity and overall impact

## Comments by Reviewer 1 and Authors' Reply

### **For author and editor**

The manuscript entitled “Kinematics and dynamics of multi-stage salt diapirs in the Dutch-Central Graben, Southern North Sea” applied a previous published classification scheme for multi-stage salt structures, and improved it by including the analysis of salt-related faulting; with the ultimate goal of differentiating regional and local geodynamic events and analyse the controlling parameters on salt tectonic styles in the Southern North Sea.

The work presented is relevant and bring interesting guidelines for deciphering the complex evolution of diapiric structures. However, from my point of view, the presented manuscript requires some modifications before being accepted for publication.

Details are provided using the Reviewer Form defined by Tektonika and uploaded in the Reviewer Files section

Regards

Mar Moragas

PhD. Earth Sciences

# Tektonika peer-review form

> This form is **mandatory**, but highly flexible.

> We encourage reviewers to read the guidance below and familiarise themselves with the form's content before starting the review.

> An annotated version of the manuscript may be uploaded as part of the review.

We remind reviewers that by accepting to review a manuscript for Tektonika, you agree to abide by our [Code of Conduct](#). No regard should be given to gender, race, age, career stage, ethnic origin or citizenship, religious belief, or political or scientific alignment of the Author(s). All reviews should be respectful to the author(s) and unacceptable behaviours will not be tolerated.

This review form aims to streamline Tektonika's peer-review process and provide a structure that supports constructive feedback to authors. It is meant to guide unambiguous comments by reviewers on different aspects of the manuscript, facilitate revision and response by the authors, and swift and fair decisions by the editors. This form contains the following sections:

## **Section A - Overall evaluation**

A1 Overall evaluation, general comments and summary

A2 Main merits, and main points of improvement

## **Section B - Detailed evaluation**

B1 Title and abstract

B2 Introduction

B3 Datasets and methods

B4 Results

B5 Discussion and conclusions

B6 Figures, tables and citations

## **Section C - Additional comments**

## **Section D - Feedback (about this review form)**

Within each form section, the form has three subsections.

### **(i) For reviewers: YES/NO statements to evaluate manuscript *form***

YES/NO in statements aimed at qualifying the submission clarity in presenting the research (e.g. clear structure, effective knowledge transfer). The statements may also be used as prompts for structuring reviewer comments.

### **(ii) For reviewers: Free-form text to evaluate manuscript *content***

Comments on scientific merit, originality and validity of the research presented, and its relevance to the journal's [scope](#).

### **(iii) For authors: Free-form text to answer reviewers' comments**

Authors should answer all reviewers' comments, point-by-point, including submitted and modified versions of text passages, and any other relevant information to allow assessing how reviewers' comments have been addressed.

In addition, both authors and reviewers may provide feedback to Tektonika about this form, and the overall peer-review process using Section D (or by email, to [jtektonika@gmail.com](mailto:jtektonika@gmail.com)).

Reviewers must complete Section A, and are strongly encouraged to fill Section B, especially for first submissions (see examples below). Sections C-D may be completed at reviewers' discretion.

### **Examples on how to fill section B “as needed”:**

- Should research be presented with insufficient clarity for the reviewer to easily assess its quality, reviewers may choose to answer to YES/NO statements only, and provide small comments to help improve the manuscript's clarity or structure.

- Should research be clearly and effectively communicated, reviewers may choose to review exclusively the manuscript's scientific content (merit, originality, validity and relevance), using the free text boxes predominantly while skipping or answering only a few of the YES/NO statements.

## **Section A: Overview of manuscript**

### **A1) Overall evaluation, general comments & summary**

#### **A1.1) Reviewer's comments**

##### **A1.1.1 ) General evaluation and publication suggestion – Required:**

*Please use this space to describe, in your own words, the core subject of the submission and your overall assessment of its suitability for publication.*

The manuscript entitled “Kinematics and dynamics of multi-stage salt diapirs in the Dutch-Central Graben, Southern North Se” applied a previous published classification scheme for multi-stage salt structures, and improved it by including the analysis of salt-related faulting; with the ultimate goal of differentiating regional and local geodynamic events and analyse the controlling parameters on salt tectonic styles in the Southern North Sea.

The work presented is relevant and bring interesting guidelines for decipher the complex evolution of diapiric basins. However, from my point of view, the presented manuscript requires some modifications before being accepted for publication.

##### **A1.1.2 ) What does the submission need to be publishable? (select as needed; comment for all cases)**

- No changes required
- Rewriting
- Reorganising
- More data/figures
- Condensing
- Reinterpretation
- Other

##### **Comments:**

From my point of view parts of the text need some amends; with rewriting, summarising and/or reorganizing them to state clear to the audience what are the relevant messages.

##### **A1.1.3) Can the submission be improved by reducing/adding any of the following? (select as needed; comment for all cases)**

- Text
- Table
- Figures
- Supplementary material

**Comments:**

[Free form box]

**A1.1.4) Please complete the following section if you recommend that the submission is NOT appropriate for publication (select as needed; comment if a box is selected)**

- Quality is poor
- Research is not reproducible
- Other

**Comments:**

[Free form box]

**A1.2) Author(s) Responses:**

No comments. It is clear what the reviewer asks and almost all comments have been heeded and addressed in the word document provided by the reviewer. Thank you for taking your time to punctiliously going over the manuscript.

## A2) Summary of main merits and main points of improvement

### A2.1) Reviewer's comments

*Please describe below in a few sentences (100 to 300 words) the main merits of the submission and suggestions for improvements.*

#### The main merits I have found are...

- The authors present a detailed evolution of diapiric structures from the initial stages to the present day, evolution that spans more than 200 My.
- The authors systematically determined the triggering and driving mechanisms that control the styles of diapirism.
- The authors revisited their own classification method of multi-stage evolution of diapiric structures and improved it by including the analysis of salt-related faulting
- The authors present a new interpretation of the dominant triggering mechanisms of early diapiric stages in the Southern North Sea

#### The main points of improvement I have found are...

- Reviewing the results section to simplify certain parts of the text. This will help readers to better understand the main findings and significant observations presented in the study.
- Review the discussion regarding the parameters that control salt tectonics, with special emphasis on providing detailed insight into how they influence the defined local stages of diapirism.

### A2.2) Author's responses:

[Free form box]

## Section B: Detailed evaluation of manuscript

### B1) Title and abstract

#### B1.1) Reviewer's comments

*These statements are a **guide** to what good Titles and Abstracts include. Please select YES or NO to the statements below if you wish and detail in the free form box below your reasons for any box checked with NO, or to comment on any other matter.*

The *Title* describes the main topic of the manuscript **accurately** — [YES]

The *Title* describes the main topic of the manuscript **succinctly** — [YES]

The *Title* includes **appropriate key terms** — [YES]

The *Abstract* includes a **clear aim and rationale** — [YES]

The *Abstract* supports the rationale with **sufficient background information** — [YES]

The *Abstract* includes a **well-balanced description of the methods** — [YES]

The *Abstract* describes the **main results sufficiently and adequately** — [NO]

The *Abstract* clearly describes the **importance/impact of the study** — [YES]

The *Abstract* clearly states the **conclusions of the study** — [NO]

The *Abstract* is **clear and well structured** — [YES]

### **Comments:**

Related to the main results and conclusions of the study, I would recommend to include in the abstract more details about the processes / mechanisms, not only the quantification of the initial phase of the structures.

## **B1.2) Author's responses**

We have addressed the reviewer's comments regarding the abstract; the abstract now includes more information about the main results and the comments the reviewer had in the word document.

## **B2) Introduction**

### **B2.1) Reviewer's comments**

*These statements are a **guide** to what good Introductions include. Please select YES or NO to the statements below if you wish and detail in the free form box below your reasons for any box checked with NO, or to comment on any other matter.*

The *Introduction* provides **sufficient background and context** for the study — [YES]

The *Introduction* describes the **aim/hypothesis/rationale** clearly, providing **sufficient context** — [YES]

The *objective/hypothesis/rationale* **flows logically from the background** information — [YES]

The *Introduction* describes the study's **objective and approach** (last paragraph) — [NO]

The *Introduction* contains **relevant, suitable citations** — [NO]

The *Introduction* is **organized effectively** — [YES]

**Comments:**

Related to the 1<sup>st</sup> statement, from my point of view, the introduction would be improved by clarify why is relevant to include salt-related faults compare to the classification methodology that the authors have already applied in the basin (how the classification is improved by including fault information?). Related to the 2<sup>nd</sup> statement, the authors did not mention any background information about previous studies regarding salt tectonic evolution in the studied area (see comment regarding discussion).

## B2.2) Author's responses

Dear reviewer, thank you for your incisive comments. Germane to the 1<sup>st</sup> statement, this has been addressed in the introduction from Line 57 – 66. Regarding the 2<sup>nd</sup> statement, this has also been addressed. Thank you much for these comments; they improve the readability of the manuscript and makes the introduction cogent.

## B3) Data and methods

### B3.1) Reviewer's comments

*These statements are a **guide** to what good Method sections include and good practices for Dataset accessibility. Please select YES or NO to the statements below if you wish and detail in the free form box below your reasons for any box checked with NO, or to comment on any other matter.*

The *Methods* are described **concisely and with enough detail** for reproducibility — [YES]

Necessary information about **data sources/acquisition/processing** is included — [YES]

**Data used are accessible** via either supplementary files or links in the data availability statement — [NO]

The *Dataset and/or Methods* are **organized effectively** — [YES]

**Comments:**

[Free form box]

## **B3.2) Author's responses**

[Free form box]

## B4) Results

### B4.1) Reviewer's comments

*These statements are a **guide** to what good Result sections include. Please select YES or NO to the statements below if you wish and detail in the free form box below your reasons for any box checked with NO, or to comment on any other matter.*

The *Results* findings are **supported by data** — [YES]

The *Results* findings are presented **clearly and succinctly** — [NO]

The text in the *Result* section **cites tables and figures appropriately** — [YES]

The *Results* directly **relate to the study objectives** — [YES]

The *Results* present **data for all the approaches** described in the *Methods* section — [YES]

The *Results* **text belongs to the Results section**, not to *Introduction*, *Methods*, or *Discussion*. — [YES]

The *Results* section is **organised effectively** — [NO]

#### **Comments:**

From my point of view, this part of the manuscript has room for improvement in terms of clarity and organisation. Main suggestions are related to:

- Section 4.2 “Salt structural relationships”: After going through the entire manuscript, I would recommend to remove this section. The authors present again the salt structure relationships with both basement or rift-related structures in the time-by-time evolution sections, with more details and interpretation. So, I would keep the time-by-time description and remove this general one.
- Sections from 4.5 to 4.10: Rewriting in a more concise and simple style would help to highlight the main relevant points in each time period. There are some suggestions on section 4.5 in the attached to the reviewed document that can be apply in all the sections.
- Section 4.11 and 4.12: I would recommend to move section 4.11 and 4.12 (and related figures) up in section 4. These two sections established the diagnostic criteria for defining the local stages of diapirism together with the mechanisms. Thus, I think that these two sections need to be presented 1st and then go through the full time-by-time interpretation.

### B4.2) Author's responses

Dear reviewer, most of your comments have been heeded and addressed in the word document I am attaching as part of my revision's submission. Kindly look at the attached document.

## B5) Discussion and conclusions

### B5.1) Reviewer's comments

*These statements are a **guide** to what good Discussions and Conclusions include. Please select YES or NO to the statements below if you wish and detail in the free form box below your reasons for any box checked with NO, or to comment on any other matter.*

The *Discussion* is **focused on the objectives** of the study — [YES]

The *Discussion* **addresses all major results** of this study, which are shown in *Results* — [YES]

The *Discussion* section makes **comparisons with other studies** that are relevant and informative — [NO]

The *Discussion* section properly identifies all **speculative statements** — [NO]

The *Discussion* section presents the **implications of the study** persuasively — [NO]

The *Discussion* section **highlights novel contributions** appropriately — [YES]

The *Discussion* section **addresses the limitations** of the study appropriately — [NO]

The *Discussion* section is **organised effectively** — [NO]

The *Conclusions* are **consistent** with and **summarise** the rest of the manuscript — [NO]

The *Conclusions* are **supported by the data** in *Results* and **follow logically** from the *Discussion* — [YES]

The *Conclusions* are **clear and concise** — [YES]

#### **Comments:**

Related to the discussion section there are 2 main issues that need to be addressed. 1<sup>st</sup> in the introduction part of the discussion, the authors make a statement that **extensional tectonics and reactive diapirism is the main triggering mechanism for salt diapirs**, whereas they demonstrate that in the main Dutch-Central Graben salt diapirs were triggered halokinetically as salt anticlines and reactive diapirism is the main trigger in the shoulders and margins of the Graben. Is the first part of the text (highlighted in bold) generic or applied to your studied basin? Based on a similar analysis in the same basin, Warsitzka and co-authors (2018) conclude that “*Most of the first generation salt structures are located in extensional sub-basins or along discrete fault zones formed during the Early and Middle Triassic. Hence, basement-involved normal faulting sometimes in combination with detached, thin-skinned extension and gravity gliding was the prime trigger for early stage salt movements*”. This interpretation differs from yours, so I think that is worthy to discuss these different interpretations in detail.

The second main feedback on the discussion section is related to the section 5.1. Controls of salt diapirism. A general comment from this section is that for me is not clear the final message about how the different elements that you discussed (syn-depositional controls of Zechstein salt layers, Basement controls, and Mesozoic syn-depositional controls) controlled or influenced salt diapirism. I have included some specific points in section 5.1.1, but this also applied to other subsections in 5.1. I would recommend to re-visit this

part of the discussion and keep it focused on the salt diapirism and the diapiric stages.

Regarding the Conclusions, be sure that you highlight the most relevant input from your work e.g. summary about how faulting improves the interpretation of multistage diapirism, key controls on the salt diapir stages,...

## B5.2) Author's responses

Dear reviewer, we have clarified this point in the main document. Indeed, Warsitzka et al., (2018) acknowledged that trigger mechanisms are due to the interplay between regional tectonics, thick-skinned deformation, and gravity thin-skinned deformation. As a matter of fact, Gaitan & Adam (2023) concurred with these observations. Nevertheless, both, Warsitzka et al. (2018) & Gaitan & Adam (2023) are regional studies which expand farther beyond the Dutch-CG. Indeed, if we are talking about the same Warsitzka et al. (2018), this study considers the full Central Europe Southern Permian Basin, including of course, continental northern Europe.

Regarding the second point, this has been addressed in the main document.

For the Conclusions, we have heeded your comment and we have highlighted the most relevant aspects of our work, particularly, revolving faulting introduction into the regional methodology.

## B6) Figures, tables and citations

### B6.1) Reviewer's comments

*These statements are a **guide** to what good Figures and Tables include and how they are presented. Please select YES or NO to the statements below if you wish and detail in the free form box below your reasons for any box checked with NO, or to comment on any other matter.*

*Tables and Figures are **ordered logically** and **numbered sequentially** — [YES]*

*Tables and Figures have **captions that explain** all their major features — [YES]*

*Tables and Figures have **captions that complement** the information in the main text — [YES]*

*Tables and Figures present data that **relate** to the study objective — [YES]*

*Tables and Figures present data that are **consistent** with and support the description of results — [YES]  
/ [NO]*

*Tables and Figures have **succinct and informative titles** — [YES]*

*Figures are **accessible** (elements are clearly labelled, accessible colour palettes, colour contrasts, font size legible, etc....) — [YES]*

*Please, check our [[Figure guidelines](#)]*

*Figures with **maps or cross-sections** contain all **elements to be understood** (north arrow orientation, scale, visible coordinates, sufficient coordinate grid intercepts) — [YES]*

*Figures with maps* have **sufficient location information** (in the map or caption) — [YES]

*Cross-sections* have clear labels for **scale and coordinates** at ends and within-section kinks — [YES]

All georeferenced elements are provided in common format (.shp, .geotiff, .kml) [in an open-access repository] — [YES] / [NO]

*Citations* throughout are relevant, suitable, and comprehensive — [YES]

**Comments:**

[Free form box]

**B6.2) Author's responses**

[Free form box]

**Section C: Additional comments**

**C1) Minor/line-numbered comments**

**C1.1) Reviewer's comments**

[Free form box]

**C1.2) Author's responses**

[Free form box]

**C2) Other remarks**

**C2.1) Reviewer's comments**

[Free form box]

## **C2.2) Author's responses**

[Free form box]

### **Section D: Feedback to improve Tektonika's review process**

*We kindly ask reviewers and authors to provide any feedback that can help improve this review form, or other aspects of the review process.*

*Feedback can also be emailed at any time to [jtektonika@gmail.com](mailto:jtektonika@gmail.com)*

## Comments by Reviewer 2 and Authors' Reply

### For author and editor

The manuscript “Kinematics and dynamics of multi-stage salt diapirs in the Dutch-Central Graben, Southern North Sea” presents a case study for employing a workflow in interpreting salt evolution in rift basins. The authors combined interpretations of seismic reflection terminations, salt-related faulting, and thickness variations in sedimentary sequences to define a kinematic history of salt structures in the Dutch Central Graben. Unfortunately, this submission is poorly written, too long, and badly structured. The manuscript is littered with numerous grammatical errors, incorrect usage of English, and incomplete sentences; all of which made this submission so exhausting to read, let alone review. In addition to the numerous faults in writing, I had minor issues with the interpretations and analysis done in this study. I recommend that the manuscript should be accepted with major revisions, because I do believe that there are valuable results for the scientific community in this study, but they are hidden in the clunkily written mess.

I apologize to the authors for being so negative, because I do believe this could be a good study. I know you CAN rework it and clean it up. I will gladly review a revised version, because the resulting kinematic history of the salt structures is very interesting.

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A2 Main merits, and main points of improvement

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B1 Title and abstract

B2 Introduction

B3 Datasets and methods

B4 Results

B5 Discussion and conclusions

B6 Figures, tables and citations

## **Section C - Additional comments**

## **Section D - Feedback (about this review form)**

Within each form section, the form has three subsections.

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YES/NO in statements aimed at qualifying the submission clarity in presenting the research (e.g. clear structure, effective knowledge transfer). The statements may also be used as prompts for structuring reviewer comments.

**(ii) For reviewers: Free-form text to evaluate manuscript *content***

Comments on scientific merit, originality and validity of the research presented, and its relevance to the journal's [scope](#).

**(iii) For authors: Free-form text to answer reviewers' comments**

Authors should answer all reviewers' comments, point-by-point, including submitted and modified versions of text passages, and any other relevant information to allow assessing how reviewers' comments have been addressed.

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- Should research be clearly and effectively communicated, reviewers may choose to review exclusively the manuscript's scientific content (merit, originality, validity and relevance), using the free text boxes predominantly while skipping or answering only a few of the YES/NO statements.

## **Section A: Overview of manuscript**

### **A1) Overall evaluation, general comments & summary**

#### **A1.1) Reviewer's comments**

##### **A1.1.1 ) General evaluation and publication suggestion – Required:**

*Please use this space to describe, in your own words, the core subject of the submission and your overall assessment of its suitability for publication.*

The manuscript “Kinematics and dynamics of multi-stage salt diapirs in the Dutch-Central Graben, Southern North Sea” presents a case study for employing a workflow in interpreting salt evolution in rift basins. Unfortunately, this submission is extremely poorly written, too long, and badly structured. The manuscript is full of numerous grammatical errors, incorrect usage of English, and incomplete sentences; all of which made this submission difficult to read, let alone review. In addition to the numerous faults in writing, I had minor issues with the interpretations and analysis done in this study. I recommend that the manuscript should be accepted with major revisions, because I do believe that there are valuable results for the scientific community in this study, but they are hidden in the clunkily written mess.

##### **A1.1.2 ) What does the submission need to be publishable? (select as needed; comment for all cases)**

- No changes required
- Rewriting
- Reorganising
- More data/figures
- Condensing
- Reinterpretation
- Other

##### **Comments:**

[This manuscript needs significant changes: reorganization, rewriting, condensing and reinterpretation of the results in some cases.

The manuscript is poorly written, in passive voice, and has too many run-on sentences, incomplete statements, and empty statements. Do NOT use passive voice in scientific writing. The sentences will be clunky, difficult to follow, and less impactful. The authors should read the article “Writing Modern Geoscience” by Randolph Williams which was in the latest issue of Tektonika. He discusses manuscript structure, active voice, how to organize a paragraph, and more (most of this is basically putting a scientific spin on Strunk and White’s “Elements of Style”, which is like the bible for essay writing).

The Method section is poorly written and provides no information on what they are doing in this study. The “workflow” (not “methodology” as they incorrectly call it) is never clearly defined within this paper, instead the reader is directed to their previous paper. Because they are relegating the description of the work done to another paper, the methods section is then filled with empty statements. An example of such a sentence is in lines 234-236: “The methodology and nomenclature allow a basin-scale correlative framework and a detailed salt kinematic characterization of all and individual salt structures which reflect local salt tectonic and halokinetic processes”. This statement does not relay any information to the reader about what methods were used or why. First, the “methodology and nomenclature” is never defined. If we break down the statement, it reads as “a regional framework reflects local tectonic and salt processes”. That does not say anything about how X is used to get Y (where Y should be the aim of the study). The Methods section should clearly and concisely describe the actual work done in this study to make the conclusions. The methods used for identifying kinematic salt stages are touched on in section 4.11-4.12, but that comes after the main results section. I would suggest reworking the methods to describe the analytical methods (fault interpretation, seismic reflector terminations, seismic attributes, thickness variations, etc) used to identify the kinematic stages of the salt.

The “Results” section should be called “interpretations”. This section is too long and full of needless statements and observations. This reads more like a report where you throw everything you did into it, rather than a scientific article. The sections discussing the “structural trends” are unnecessary because the horizons are only providing you with the modern-day topography so the authors need to be careful. Any “high” or “low” areas are reflective of the integrated tectonic history. What is perhaps a structural high on the Top Early Triassic TWT map, may not truly represent the topography at that time. Instead, the thickness maps combined with subcrops maps, seismic attribute and facies analyses should be used to determine unconformities and how thicknesses are related to tectonics. It appears that just thicknesses themselves, without any other information, are used to indicate tectonics, but that should not be a 1:1 correlation. For example, the authors state that paleo depocenters in the northern part of the basin are fault related in the Early Triassic, but I do not see any thickening into faults. I see a general pattern of thickness that could be related to the paleobathymetry at the time of deposition. If the authors mean that the general growing of basinal deposits is due to extension but not necessarily hangingwall deposits, the authors need to clarify. As an important side note: the authors should plot the faults on the thickness maps.

The Discussions section is organized well but needs grammatical corrections.

Additionally, the conclusion does not make a connection with their results and their reasoning for why such a study is important. In the Introduction, the authors state that understanding salt kinematics is important for the green transition in the energy sector but do not relate their results to information that the energy sector could use. The paragraph in lines 1084-1089 they again state that salt structures are important for industry but do not concretely state how their results can help the industry. I suggest that they look at the Duffy et al., 2023 paper (they refer to it in their intro) for ways to highlight their results in terms of importance to the industry. This only needs to be a few examples in two sentences, but it will highlight the importance of the study and their methods.]

**A1.1.3) Can the submission be improved by reducing/adding any of the following? (select as needed; comment for all cases)**

Text

- Table
- Figures
- Supplementary material

**Comments:**

[The manuscript is too long, needs to be cut and condensed. Please see my comments in A1.1.2 for suggestions on how the text should be restructured.

The figures are very nicely done and very easy to understand. But a lot of figures were unnecessary or could be shortened. I personally don't think the TWT structure maps are needed for the manuscript. Yes, I know if they were missing, I would probably be complaining about them not being there. But in this case, they do not add much to the main goal nor are they important for the conclusions. As stated before, the thickness maps (isochrons) should have faults in them.

Some minor notes:

- In legends for figures 10-15 there is a tiny table with Regional vs local stages that is always empty. What is the point of that table?
- I would suggest removing figure 9, the trends of the salt diapirs and walls are not a major result and are fine just being discussed in the text.
- Can figures 6 and 7 merged into one figure? Just remove the seismic profiles without interpretations.
- Figure 2 would work better in the discussion.
- The real valuable figures are 16-20, but perhaps 4 is overkill?

]

**A1.1.4) Please complete the following section if you recommend that the submission is NOT appropriate for publication (select as needed; comment if a box is selected)**

- Quality is poor
- Research is not reproducible
- Other

**Comments:**

[I am not sure I should be checking this box. In its current form, the manuscript is not appropriate for publication. But I believe that it could be if significant changes were done to the writing.]

## **A1.2) Author(s) Responses:**

Dear reviewer, thank you for your time and comments. We appreciate your comment regarding the manuscript being poorly written. Interestingly, and we acknowledge this should not be in any way a QC for grammar, but according to word “Editor Score”, the manuscript scores >90%. I am sure Editor Score would have picked up most of this improper English use you allude to. Regardless, we have improved the abstract substantially, and we hope it is now up to snuff.

Regarding the Methodology, we agreed that the methodology was already presented in Gaitan & Adam (2023), and we have emended the sub-title to “workflow”. Thank you for your comment.

We have taken in consideration most of your comments for the improvement of our manuscript.

For the “Results”, we thoroughly revised and jettisoned what we thought you might have referred to as “needless statements and observations”.

Comments from A1.1.3)

Dear reviewer, we have heeded your comment about the length of the manuscript. All in all, the manuscript is c. 2,000 words shorter.

We do not agree on the deleting the structure maps, as we allude to structural features that we need to point at. Germane to the tiny table for figures 10-15, we have deleted it as we thought it would clarify the “chrono-halokinetic stacks”, but clearly it caused more confusion. Thank you for the comment.

## **A2) Summary of main merits and main points of improvement**

### **A2.1) Reviewer’s comments**

*Please describe below in a few sentences (100 to 300 words) the main merits of the submission and suggestions for improvements.*

#### **The main merits I have found are...**

[I think the systematic workflow for examining each megasequence in a rift basin for indicators of salt movement is a very useful contribution to understanding salt-involved rifting. The combination of mapping seismic reflection terminations, radial fault geometries using coherence (similarity) attributes, and paleo depocenters is a very smart way to determine the temporal and kinematic evolution of salt structures in an active rift basin. I just wish this was presented in a clear and concise manuscript. I really liked how the salt structures were categorized thru each megasequence and then compiled in the discussion to build a geologic history of the Dutch Central Graben (figure 22). The work in this paper shows promise, but the manuscript needs to be reworked before I can do a detailed review.]

### The main points of improvement I have found are...

[The manuscript needs to be rewritten and reduced. The submitted manuscript was 53 pages long, not including figures or supplementary material. The authors should identify what is essential and non-essential to make their conclusions and try to reduce the manuscript accordingly.]

I also would encourage the authors to read the recent article in Tektonika about scientific writing by Randolph Williams (<https://tektonika.online/index.php/home/article/view/74/63>). ]

### A2.2) Author's responses:

Dear reviewer, thank you for your comments. We have heeded mostly the other reviewer's thorough and incisive comments; this is because the other reviewer delved into the small details and their comments/requests were clearer. In all, the manuscript is now 45 pages long, including the citations.

[Free form box]

## Section B: Detailed evaluation of manuscript

### B1) Title and abstract

#### B1.1) Reviewer's comments

*These statements are a **guide** to what good Titles and Abstracts include. Please select YES or NO to the statements below if you wish and detail in the free form box below your reasons for any box checked with NO, or to comment on any other matter.*

The *Title* describes the main topic of the manuscript **accurately** — [YES] / [NO]

The *Title* describes the main topic of the manuscript **succinctly** — [YES] / [NO]

The *Title* includes **appropriate key terms** — [YES] / [NO]

The *Abstract* includes a **clear aim and rationale** — [YES] / [NO]

The *Abstract* supports the rationale with **sufficient background information** — [YES] / [NO]

The *Abstract* includes a **well-balanced description of the methods** — [YES] / [NO]

The *Abstract* describes the **main results sufficiently and adequately** — [YES] / [NO]

The *Abstract* clearly describes the **importance/impact of the study** — [YES] / [NO]

The *Abstract* clearly states the **conclusions of the study** — [YES] / [NO]

The *Abstract* is **clear** and **well structured** — [YES] / [NO]

**Comments:**

[Free form box]

## **B1.2) Author's responses**

[Free form box]

## **B2) Introduction**

### **B2.1) Reviewer's comments**

*These statements are a **guide** to what good Introductions include. Please select YES or NO to the statements below if you wish and detail in the free form box below your reasons for any box checked with NO, or to comment on any other matter.*

The *Introduction* provides **sufficient background and context** for the study — [YES] / [NO]

The *Introduction* describes the **aim/hypothesis/rationale** clearly, providing **sufficient context** — [YES] / [NO]

The *objective/hypothesis/rationale* **flows logically from the background** information — [YES] / [NO]

The *Introduction* describes the study's **objective and approach** (last paragraph) — [YES] / [NO]

The *Introduction* contains **relevant, suitable citations** — [YES] / [NO]

The *Introduction* is **organized effectively** — [YES] / [NO]

**Comments:**

[Free form box]

## B2.2) Author's responses

[Free form box]

## B3) Data and methods

### B3.1) Reviewer's comments

*These statements are a **guide** to what good Method sections include and good practices for Dataset accessibility. Please select YES or NO to the statements below if you wish and detail in the free form box below your reasons for any box checked with NO, or to comment on any other matter.*

The *Methods* are described **concisely and with enough detail** for reproducibility — [YES] / [NO]

Necessary information about **data sources/acquisition/processing** is included — [YES] / [NO]

**Data used are accessible** via either supplementary files or links in the data availability statement — [YES] / [NO]

The *Dataset and/or Methods* are **organized effectively** — [YES] / [NO]

#### Comments:

[Free form box]

## B3.2) Author's responses

[Free form box]

## B4) Results

### B4.1) Reviewer's comments

*These statements are a **guide** to what good Result sections include. Please select YES or NO to the statements below if you wish and detail in the free form box below your reasons for any box checked with NO, or to comment on any other matter.*

The *Results* findings are **supported by data** — [YES] / [NO]

The *Results* findings are presented **clearly and succinctly** — [YES] / [NO]

The text in the *Result* section **cites tables and figures appropriately** — [YES] / [NO]

The *Results* directly **relate to the study objectives** — [YES] / [NO]

The *Results* present **data for all the approaches** described in the *Methods* section — [YES] / [NO]

The *Results* **text belongs to the Results section**, not to *Introduction*, *Methods*, or *Discussion*. — [YES] / [NO]

The *Results* section is **organised effectively** — [YES] / [NO]

**Comments:**

[Free form box]

## **B4.2) Author's responses**

[Free form box]

## **B5) Discussion and conclusions**

### **B5.1) Reviewer's comments**

*These statements are a **guide** to what good Discussions and Conclusions include. Please select YES or NO to the statements below if you wish and detail in the free form box below your reasons for any box checked with NO, or to comment on any other matter.*

The *Discussion* is **focused on the objectives** of the study — [YES] / [NO]

The *Discussion* **addresses all major results** of this study, which are shown in *Results* — [YES] / [NO]

The *Discussion* section makes **comparisons with other studies** that are relevant and informative — [YES] / [NO]

The *Discussion* section properly identifies all **speculative statements** — [YES] / [NO]

The *Discussion* section presents the **implications of the study** persuasively — [YES] / [NO]

The *Discussion* section **highlights novel contributions** appropriately — [YES] / [NO]

The *Discussion* section **addresses the limitations** of the study appropriately — [YES] / [NO]

The *Discussion* section is **organised effectively** — [YES] / [NO]

The *Conclusions* are **consistent** with and **summarise** the rest of the manuscript — [YES] / [NO]

The *Conclusions* are **supported by the data** in *Results* and **follow logically** from the *Discussion* — [YES] / [NO]

The *Conclusions* are **clear and concise** — [YES] / [NO]

**Comments:**

[Free form box]

## B5.2) Author's responses

[Free form box]

## B6) Figures, tables and citations

### B6.1) Reviewer's comments

*These statements are a **guide** to what good Figures and Tables include and how they are presented. Please select YES or NO to the statements below if you wish and detail in the free form box below your reasons for any box checked with NO, or to comment on any other matter.*

*Tables and Figures are **ordered logically** and **numbered sequentially** — [YES] / [NO]*

*Tables and Figures have **captions that explain** all their major features — [YES] / [NO]*

*Tables and Figures have **captions that complement** the information in the main text — [YES] / [NO]*

*Tables and Figures present data that **relate** to the study objective — [YES] / [NO]*

*Tables and Figures present data that are **consistent** with and support the description of results — [YES] / [NO]*

*Tables and Figures have **succinct and informative titles** — [YES] / [NO]*

*Figures are **accessible** (elements are clearly labelled, accessible colour palettes, colour contrasts, font size legible, etc....) — [YES] / [NO]*

*Please, check our [\[Figure guidelines\]](#)*

*Figures with **maps or cross-sections** contain all **elements to be understood** (north arrow orientation, scale, visible coordinates, sufficient coordinate grid intercepts) — [YES] / [NO]*

*Figures with **maps** have **sufficient location information** (in the map or caption) — [YES] / [NO]*

*Cross-sections have clear labels for **scale and coordinates** at ends and within-section kinks — [YES] / [NO]*

*All georeferenced elements are provided in common format (.shp, .geotiff, .kml) [in an open-access repository] — [YES] / [NO]*

*Citations* throughout are relevant, suitable, and comprehensive — [YES] / [NO]

**Comments:**

[Free form box]

**B6.2) Author's responses**

[Free form box]

**Section C: Additional comments**

**C1) Minor/line-numbered comments**

**C1.1) Reviewer's comments**

[Free form box]

**C1.2) Author's responses**

[Free form box]

**C2) Other remarks**

**C2.1) Reviewer's comments**

[Free form box]

## **C2.2) Author's responses**

[Free form box]

### **Section D: Feedback to improve Tektonika's review process**

*We kindly ask reviewers and authors to provide any feedback that can help improve this review form, or other aspects of the review process.*

*Feedback can also be emailed at any time to [jtektionika@gmail.com](mailto:jtektionika@gmail.com)*

## Authors' Letter

Dear editor & reviewers,

I am writing to resubmit my research article entitled "*Kinematics and dynamics of multi-stage salt diapirs in the Dutch-Central Graben, Southern North Sea*" for consideration by Tektonika.

I acknowledge that the reviewer's comments were submitted earlier this year, but it was not until mid-late May I was informed about the decision and given access to the files by Gwenn Peron-Pinvidic via email. Of course, not to mention vacations and full-time employment. Thank you for the patience.

I extend my gratitude to the reviewers for their valuable time and effort in reviewing this manuscript. Special thanks to reviewer Moragas for the detailed commentary and specific requests. By incorporating most of Moragas' insights and the general feedback from the second reviewer, the abstract has been significantly condensed by over 2,000 words, and the overall length of the paper has been reduced by approximately 10 pages. This new submission now avoids the supplement images as the authors concurred the supplement images are superfluous.

I am resubmitting six new files, including this letter to the editor and reviewers; this include, 1) the main manuscript word file, 2) a reply file to Moragas which is a copy from Moragas' comments in the main manuscript document, utilized only for addressing most of the reviewer's comments/requests, 3) manuscript figures file, 4) review form assignment response to Moragas, and 5) review form assignment to second reviewer. Note that comments within the form assignments are only fleeting comments as detail answers were provided in the reply file to Moragas' comments.

Thank you for your time and I look forward to hearing from you with any comments/requests you may have to further improve the manuscript.

## Acceptance Letter

Dear Dr. Gaitan,

Thank you again for submitting your manuscript "**Gaitan and Adam, Kinematics and dynamics of multi-stage salt diapirs in the Dutch-Central Graben, Southern North Sea, TEKTONIKA Ms76**" to Tektonika.

After careful consideration based on the revised version of your manuscript, I have decided to accept your contribution for publication with Tektonika.

You carefully answered the concerns raised by the reviewers and took in consideration their suggestions, what strengthened significantly your contribution.

I apologized once again for the delay and long time process.

Your manuscript will now be transmitted to the Copy-Editing stage and you should hear from us soon.

Best wishes,

Professor Gwenn Peron-Pinvidic, NTNU Norway.

gwenn.peron-pinvidic@ntnu.no