PLATTE RIVER RECOVERY IMPLEMENTATION PROGRAM (PRRIP -or- Program)
2024 Peer Review Summary Report – Sediment Augmentation Data Synthesis Compilation

1.0 Introduction

This document provides an overview of a formal, independent, external scientific peer review conducted for the Platte River Recovery Implementation Program ("PRRIP" -or- "Program"). The peer reviewed document is titled "PRRIP Sediment Augmentation Data Synthesis Compilation" (**Appendix A**) prepared by the Program's Executive Director's Office (EDO) using Program data and analysis.

1.1 Background

One of the Program's primary management uncertainties is the need for long-term sediment (sand) augmentation at the upper end of the Associated Habitat Reach (AHR) to offset a sediment deficit due to clearwater hydropower return flows. Stakeholders have long been concerned that incision and narrowing due to mining of sediment from the bed and banks of the channel downstream of the hydropower return will migrate downstream and impact habitat suitability for the Program's four target species (whooping crane, piping plover, interior least tern [now de-listed], and pallid sturgeon). Efforts to quantify the magnitude of the sediment deficit and develop augmentation methods began soon after Program initiation in 2007. By 2016, Program stakeholders reached consensus that the best next step in evaluating sediment augmentation would be implementation of a full-scale sediment augmentation experiment immediately downstream of the hydropower return. The full-scale augmentation experiment was initiated in 2017 with augmentation occurring annually from 2017 through 2021. In 2022, the EDO began analysis of the effectiveness of sediment augmentation, producing multiple lines of evidence across a range of spatial and temporal scales. The Sediment Augmentation Data Synthesis Compilation is a roll-up of this multi-scalar analysis and is intended to provide a framework for the Program to assess the results of sediment augmentation so far and the implications for decision-making related to sediment augmentation throughout the remainder of the Program's First Increment Extension (2020-2032) and beyond.

The Program sought an independent peer review of the Sediment Augmentation Data Synthesis Compilation. Pending internal feedback and the results of the peer review regarding the significance and relevance of methods and results presented in the Sediment Augmentation Data Synthesis Compilation, the intent is to prepare a manuscript for publication that incorporates parts of the overall report.

1.2 Purpose and Scope of Peer Review

The purpose of the peer review was to provide a formal, independent, external scientific review of the information presented in the Sediment Augmentation Data Synthesis Compilation. Reviewers were charged with evaluating the scientific merit of the document's technical analyses and conclusions, ensuring that any scientific uncertainties are clearly identified and characterized and that the potential implications of the uncertainties for the technical conclusions drawn are clear. Specifically, the PRRIP requested reviewers consider and respond to the questions listed below, at a minimum, in their reviews:

General Questions:

1. Does the Sediment Augmentation Data Synthesis Compilation adequately address the overall objective – to synthesize multiple lines of evidence from the Program's full-scale sediment augmentation experiment to assess overall results and provide useful information for decision-making related to future sediment augmentation management actions?

2. Do the authors draw reasonable and scientifically sound conclusions from the information presented? If not, please identify those that are not and the specifics of each situation.

3. Are there any seminal peer-reviewed scientific papers omitted from consideration that would contribute to alternate conclusions that are scientifically sound? Please identify any such papers including citations.

4. Are the statistical methods and modeling tools used valid and current, and are the associated results presented in a manner useful to Program decision-makers?

5. Are potential biases, errors, or uncertainties appropriately considered within the methods sections and then discussed in the results and conclusion sections?

Technical Questions:

6. LiDAR data was processed to remove non-random error to the degree possible. Accordingly, two- and three-dimensional change analyses did not utilize methods (e.g., thresholding) to quantify and/or account for error. Was that an appropriate approach? Would you suggest an alternative approach to quantifying and addressing error?

7. Is the method used to separate lateral erosion from bed aggradation/degradation appropriate? Would you suggest any alternative method be utilized?

In addition to providing written comments and responses to the General and Technical questions above, each reviewer was charged with providing a separate comprehensive rating and recommendation utilizing the following format:

RATING

Please score each aspect of this set of chapters using the following rating system:
1 = Excellent; 2 = Very Good; 3 = Good; 4 = Fair; 5 = Poor

Category	**Rating**
Scientific soundness	_____
Degree to which conclusions are supported by the data	_____
Organization and clarity	_____
Cohesiveness of conclusions	_____
Conciseness	_____
Important to objectives of the Program	_____

RECOMMENDATION	**(Check One)**
Accept	_____
Accept with revisions	_____
Unacceptable	_____

If a peer reviewer checked "Accept with Revisions" or "Unacceptable," that reviewer was directed to **explicitly state** what changes would be required to change the recommendation to "Accept." This is a critical step in ensuring the Program understands potential fatal flaws or major areas of revision that must be addressed before finalizing these documents and seeking Governance Committee (GC) approval.

2.0 Peer Review Process

Dr. Chadwin Smith of the EDO facilitated the peer review process for the PRRIP. The process included the following steps:

1) Develop a Scope of Work for the peer review.
2) Identify potential peer review candidates; contact all candidates and screen for expertise criteria and potential conflicts of interest; obtain biographical sketches and CVs/resumes for all candidates.
3) Work with the PRRIP Peer Review Selection Panel to vet all candidates and recommend three (3) reviewers for the Peer Review Panel to be approved by the GC.
4) Communicate with all candidates regarding the Peer Review Panel selection process and contract with the appointed peer reviewers.
5) Distribute peer review materials to each reviewer and conduct individual virtual discussions with the peer reviewers to discuss the review scope and documents and to address any questions.
6) Develop a Peer Review Summary Report providing an overview of all review comments and a trackable spreadsheet of all specific technical comments. This includes working with EDO staff to identify key issues identified by reviewers and proposed responses to key issues and all specific technical comments.
7) Discuss Peer Review Summary Report and proposed document changes/edits with the PRRIP Technical Advisory Committee (TAC), recommend additional changes/edits, and finalize for review by Peer Review Panel.
8) *As warranted*, elicit Peer Review Panel reaction (via electronic responses and/or virtual meeting) to proposed changes/responses to Sediment Augmentation Data Synthesis Compilation indicating acceptance or rejection of changes.
9) Discuss responses from the Peer Review Panel with the TAC and recommend final changes to Sediment Augmentation Data Synthesis Compilation for GC consideration.
10) Seek GC approval of final Peer Review Summary Report including a revised Sediment Augmentation Data Synthesis Compilation, post for public distribution via the PRRIP website.

2.1 Selection of Reviewers

The PRRIP requested peer review candidates comprising the following areas of expertise: sediment augmentation and management; sediment transport data collection and modeling; and utilization of LiDAR and other tools to evaluate large datasets over time (including dealing with topographic change and uncertainty). The following is a brief summary of the process used by Dr. Smith to identify potential peer reviewers for the Sediment Augmentation Data Synthesis Compilation with a background in one or more of these broad categories of expertise:

Step 1 – Develop a Peer Review Scope of Work.

Dr. Smith developed a Peer Review Scope of Work (**Appendix B**) for the Sediment Augmentation Data Synthesis Compilation in consultation with EDO staff and members of the TAC. The Scope of Work includes background information on the Sediment Augmentation Data Synthesis Compilation, specific questions to be addressed by each peer reviewer, and a peer review ranking process.

Step 2 – Solicit peer review candidates.
Peer review candidates were solicited in the following manner:

- Dr. Smith's personal expertise network.
- Recommendations from the PRRIP Executive Director and EDO staff.
- Recommendations from members of the PRRIP TAC.
- Candidates previously vetted by the PRRIP ISAC Selection Panel for consideration as an ISAC members for the open fluvial geomorphology seat on the ISAC in 2023.
- Identification of subject matter experts in government, academic, and industry fields from current publications on sediment augmentation, management, and evaluation (preferably in braided river systems); sediment transport data collection and modeling; and utilization of LiDAR and other tools to evaluate large datasets over time.
- Peer review candidates were contacted to determine their interest, availability, and willingness to serve. This contact was conducted electronically and by phone. Each candidate was provided with a copy of the Scope of Work and Dr. Smith discussed the anticipated peer review schedule, desired experience, and potential conflicts of interest with all candidates.

Step 3 – Obtain information from each peer review candidate.
Prospective candidates were asked to provide a short biographical statement and their most current CV. All candidates indicated the peer review schedule was acceptable and that they would be able to sign the Program's Certification Regarding Lobbying and the Program's Peer Reviewer Conflict of Interest Form.

In November 2023, Dr. Smith submitted a Peer Review Candidate Report (**Appendix C**) to the Peer Review Selection Panel. The Candidate Report identified ten (10) individuals contacted about the peer review, six (6) of which were presented as a candidates. Based on the recommendation of the Peer Review Selection Panel, in December 2023 the GC appointed the following individuals to the Sediment Augmentation Data Synthesis Compilation Peer Review Panel:

		Expertise Area(s)		
Name	**Affiliation**	*Sediment Augmentation, Management, & Evaluation (braided rivers)*	*Sediment Transport Data Collection & Modelling*	*LiDAR & Other Tools for Large Datasets; Topographic Change and Uncertainty*
James Brasington, Ph.D.	University of Canterbury (NZ)	**X**	**X**	**X**
Mark Smith, Ph.D.	University of Leeds (UK)		**X**	**X**
Richard Williams, Ph.D.	University of Glasgow (Scotland)	**X**	**X**	**X**

2.2 Document Review and Peer Review Report Development

In January 2024, Dr. Smith transmitted all review-related documents to and held individual virtual meetings with all three (3) peer reviewers. The reviewers conducted their independent desktop reviews between February and May 2024. Peer reviewers submitted the following deliverables:

1) Responses to the General and Technical Questions identified in the Scope of Work.

2) Ratings of the WEST report and synthesis chapters in five different categories, as well as an overall recommendation for acceptance.
3) Specific comments on the text of the Sediment Augmentation Data Synthesis Compilation.

This Peer Review Summary Report provides a general summary of the reviewers' responses to the General and Technical Questions and their rankings of the Sediment Augmentation Data Synthesis Compilation. **Appendix D** includes the full set of comments from each reviewer and **Appendix E** includes all specific comments compiled by page and line number (if applicable) in the original document (before any changes or edits made post-review; see **Appendix A**). As described in the PRRIP Peer Review Guidelines and addressed in the Peer Review Scope of Work, all three (3) reviewers chose to have their review comments attributed throughout the peer review process.

3.0 Peer Review Results

Below are summaries of the individual reviewers' responses to the five (5) General Questions (Section 3.1) and two (2) Technical Questions (Section 3.2) posed by the PRRIP. These summaries are not intended to be comprehensive, rather they attempt to capture an overview of the reviewers' primary comments. For the reviewers' full comments, see **Appendices D and E**. The comment spreadsheet was created to capture comments, recommendations, and editorial suggestions by chapter, page, and line number (if applicable). Ratings and Recommendations relating to acceptability of the report are summarized in Section 3.3.

3.1 Reponses to General Questions

1. *Does the Sediment Augmentation Data Synthesis Compilation adequately address the overall objective – to synthesize multiple lines of evidence from the Program's full-scale sediment augmentation experiment to assess overall results and provide useful information for decision-making related to future sediment augmentation management actions?*

Brasington – Answered throughout general and specific comments on Sediment Augmentation Data Synthesis Compilation, see **Appendices D and E**.

Smith – Yes. This is a well presented and well-compiled report of an interesting management implementation. A data-rich approach is taken, and the data are interrogated thoroughly and appropriately. The use of multiple lines of evidence that each confirm a clear outcome adds further support to the conclusions made. My comments above are mainly focused on increasing the clarity and adding further contextual information to support decision-makers, but I endorse the findings made here.

Williams – Overall, I consider that the report has the correct overall experimental framework to address the Big Science Question: "Is sediment augmentation necessary to create and/or maintain suitable whooping crane habitat?" In particular, it presents a wide-ranging set of different lines of evidence. However, I do consider that there are a number of issues that require clarification or additional supporting analyses that could help to support some methodological assumptions that have been made, including the characterisation of uncertainty in the volumetric change estimates. I recommend that the Executive Summary is carefully revisited following any revisions and, in particular, a graphical diagram that summarises the various conclusions for different segments of the river may help to summarise the information for decision makers.

2. *Do the authors draw reasonable and scientifically sound conclusions from the information presented? If not, please identify those that are not and the specifics of each situation.*

Brasington – This report is an impressive and comprehensive examination of an ambitious field experiment. In recent decades, sediment augmentation has emerged a well-established intervention that aims to address the physical and ecological consequences of impounding and regulating natural river flow regimes. Few attempts to achieve this, however, have been designed as effectively and scrutinized as robustly as detailed here. The approach taken is distinctive, and I would argue world-leading, for its application of powerful emerging technologies. The acquisition and interrogation of dense topobathymetric lidar covering a 6-year period provides an unparalleled, data rich lens through which to assess this intervention. While I have some technical questions

over the precise approach to the volumetric change analysis and uncertainty estimation, I find the broad geomorphological interpretation astute and compelling.

Smith – Yes. The data are clearly presented and support the conclusions made. While I have minor suggestions regarding data presentation of the volume change results, these are simply to give further confidence that systematic errors are not problematic. The fact that the evidence presented by the volumetric change analysis confirms previous thalweg-based analysis suggests that none of this would adjust the overall conclusions made.

Williams – Answered throughout general and specific comments on Sediment Augmentation Data Synthesis Compilation, see **Appendices D and E**.

3. *Are there any seminal peer-reviewed scientific papers omitted from consideration that would contribute to alternate conclusions that are scientifically sound? Please identify any such papers including citations.*

Brasington – Additional references integrated into comments, see **Appendices D and E**.

Smith – I suggest that the overall conclusions are scientifically sound. The citations I present in this document regarding DEM differencing (Wheaton et al., 2010; Brasington et al., 2012; Smith et al., 2015) and sediment budget segregation (Wheaton et al., 2013 in minor comments below) are simply alternative approaches to some of the methodological choices here.

Williams – A reference list to the associated citations is provided below. I note that the report doesn't contextualise the effects of sediment augmentation with other global examples; this would be likely required for publication and the authors may wish to consider broader contextualisation for this report. As a starting point, I would recommend the review by Staentzel et al. (2020).

4. *Are the statistical methods and modeling tools used valid and current, and are the associated results presented in a manner useful to Program decision-makers?*

Brasington – Answered throughout general and specific comments on Sediment Augmentation Data Synthesis Compilation, see **Appendices D and E**.

Smith – Yes. There are no issues here. The most complex statistics (GAMMs) are well explained and represented visually. Overall, the report takes a visual approach to representing the data which are also quantified into summary statistics. It is very clear. There were few details on the modelling methods used, though these were often not the core of the analysis, but rather provided a step of the analysis (e.g., to identify a wetted area for given discharge). I was a little unclear as to where in the workflow these models were used and their impact on the final findings (see main comment above), but again I should reiterate that I do not think this has any impact on the conclusions.

Williams – Answered throughout general and specific comments on Sediment Augmentation Data Synthesis Compilation, see **Appendices D and E**.

5. *Are potential biases, errors, or uncertainties appropriately considered within the methods sections and then discussed in the results and conclusion sections?*

Brasington – Answered throughout general and specific comments on Sediment Augmentation Data Synthesis Compilation, see **Appendices D and E**.

Smith – More discussion of these for the volumetric change analysis chapter would be useful (see main comment 6 above). The relative magnitude of different uncertainties relative to the differences observed could be better articulated. I should add that I see no cause for concern, rather it is in the interest of clear reporting to do so. Presenting DEMs of Difference would add further confidence that there exist no outstanding systematic errors in the data.

Williams – Answered throughout general and specific comments on Sediment Augmentation Data Synthesis Compilation, see **Appendices D and E**.

3.2 Responses to Technical Questions

6. *LiDAR data was processed to remove non-random error to the degree possible. Accordingly, two- and three-dimensional change analyses did not utilize methods (e.g., thresholding) to quantify and/or account for error. Was that an appropriate approach? Would you suggest an alternative approach to quantifying and addressing error?*

Brasington – Answered throughout general and specific comments on Sediment Augmentation Data Synthesis Compilation, see **Appendices D and E**.

Smith – There is a precedent here (Anderson, 2019) which is cited by the report. While it is not my preferred method, I think it is appropriate for the scale of the study. The largest assumptions in the report arise from the calculation of sediment volume changes from the 2009 LiDAR data that had no bathymetric component (P90). The report clearly flags the uncertainty arising from this (e.g., P94) but would likely be the most open to criticism. As described in my comments above, I would like to see more DEMs of Difference to help clarify visually that no residual systematic errors remain.

Williams – The reporting of vertical errors before and after post-processing to minimise systematic errors is not sufficiently detailed for me to be able to assess the effectiveness of this correction (see comment g above). It would also be useful to know more about the roughness (i.e. grain size) of the active channel to discern what the influence of roughness may be on the character of the LiDAR derived surface. I also envisage that the presence (and likely removal) of vegetation from the LiDAR derived surfaces (e.g. sparsely vegetated bars) will also contribute uncertainty that is more spatially variable in character than that which has been systematically corrected. In my experience, I have conducted and reviewed very few sediment budgeting analyses that haven't quantified uncertainties, often although not always using the types of probabilistic thresholding approaches reviewed by Vericat et al. (2017). Although the authors cite Anderson (2019), Anderson still argues that estimated uncertainty bounds should be part of a quantitative estimate of volumetric or mean change (second bullet point in the conclusion e.g. Figure 11 and Table III of Anderson's (2019) example). I recommend that either Vericat et al.'s (2017) and/or Anderson's (2019) approaches could be used to characterise uncertainty and enable more rigorous

assessment of whether some of the observed changes are indistinguishable from zero within uncertainty.

7. *Is the method used to separate lateral erosion from bed aggradation/degradation appropriate? Would you suggest any alternative method be utilized?*

Brasington – Answered throughout general and specific comments on Sediment Augmentation Data Synthesis Compilation, see **Appendices D and E**.

Smith – I can see that this method makes intuitive sense and is defensible. My previous experience was with the method described by Wheaton et al. (2013) of segregating the sediment budget by mechanism. The approach implemented here has the benefit of simplicity and would likely result in the same outcome. As per my minor comment (below) on P85, some visual example of this segregation process would be helpful as the description of the methods here was quite brief.

Williams – See comment (h) above for my answer to this question. In summary, the approach used may be appropriate, but I would like to see a comparison to manual expert interpretation to enable a quantitative assessment of the quality of its ability to segment this type of geomorphic change.

3.3 Ratings and Recommendations

Reviewers rated the Sediment Augmentation Data Synthesis Compilation using the following PRRIP rating system: 1 = Excellent; 2 = Very Good; 3 = Good; 4 = Fair; 5 = Poor. **Table 3-1** summarizes each reviewer's ratings.

Table 3-1. Peer reviewers' comprehensive ratings of the Sediment Augmentation Data Synthesis Compilation, by category.

Category	Brasington	Smith[1]	Williams[2]
Scientific soundness	1	2	3
Degree to which conclusions are supported by the data	1	2	3
Organization and clarity	1	3	2
Cohesiveness and clarity	1	2	2.5
Conciseness	1	3	3
Important to objectives of the Program	1	2	1
Rating Average	1	2.3	2.4

The peer reviewers were asked to provide their recommendation to either accept the Sediment Augmentation Data Synthesis Compilation, accept it with revisions, or deem the report unacceptable. *All three reviewers recommended the Sediment Augmentation Data Synthesis Compilation be accepted with revisions.* To accept the Sediment Augmentation Data Synthesis Compilation, the peer reviewers suggested the following key revisions:

[1] Smith transposed the rating scale (e.g., Categories rated a "4" should instead be rated a "2" etc.). Those transpositions have been fixed in Table 3-1, the original ratings remain in his comment set.
[2] Williams transposed the rating scale (e.g., Categories rated a "4" should instead be rated a "2" etc.). Those transpositions have been fixed in Table 3-1, the original ratings remain in his comment set.

Brasington:
I have raised a number of discussion points through this review, the most significant of which relate to the DEM differencing methods employed in Chapter 4 and, in particular, the absence of formal quantification of volumetric change uncertainty. I appreciate the approach taken by the team in this regard but would encourage them to consider the range of options available to compute the residual systematic error and to incorporate this within the presentation of the results.

Smith:
1. **Context**. Comments 1-3 all deal with background context. These were things I felt would enable decision makers to better interpret the evidence provided. Some text on the catchment, flows, history, etc., would be useful, but I recognize that this may not be appropriate for the intended use of the report.
2. **Structure**. I would try to split out result description and interpretation where possible. I realize this is challenging in places. A brief summary section to directly relate key conclusions back to the underlying evidence presented would be helpful here (either at the end of the document or making better use of the existing Executive Summary). The description of the data collection (i.e., LiDAR, flow gauges and related data) could be expanded, separated out from results description and interpretation and moved earlier in the document.
3. **Volumetric changes**. The LiDAR volumetric changes section would benefit from presentation of DEMs of Difference to visually identify any residual systematic errors. Consideration of the relative magnitude of potential errors would also be useful alongside the magnitude of observed topographic changes. See the main comments 6-7 above.
4. **Minor points**. I have a number of minor points below. While these don't all require action, it would be good if they could be considered.

Williams:
1. **Scientific Soundness.** An enormous amount of effort has been spent acquiring, processing and interpreting data. However, I consider that some clarifications are needed, which would enable this score to be increased.
2. **Degree to which conclusions are supported by data.** These are generally sound, but I consider clarifications are needed to ensure that conclusions are appropriate. Addressing these would enable this score to be increased.
3. **Conciseness.** See comments on presenting a clearer contextualisation, organising methods in one place, and using more cross-referencing to avoid repetition.

3.4 Other Specific Comments
In reviewing the results of the peer review and evaluating potential responses to specific comments, EDO staff identified four (4) key comments regarding analysis and methods that will be discussed with the TAC and the Program's Independent Scientific Advisory Committee (ISAC) to elicit feedback on the direction of the proposed EDO responses. **Table 3.2** provides more detail on those key comments:

Table 3.2. Key peer review comments on analysis and methods, and proposed EDO responses.

1. LiDAR and Raster Differencing Uncertainty
We requested feedback on our decision not to threshold our LiDAR data or quantify/account for error in our two- and three-dimensional analyses. Most reviewers understood our reasoning but wanted to be shown more clearly a) what the error was and b) how much thresholding/not thresholding would have altered results. For example, Brasington asked us to include more details and evidence regarding the LiDAR contractor's removal of systematic errors, while Williams pointed out that Anderson 2019 (which we cite) "argues that estimated uncertainty bounds should be part of a quantitative estimate of volumetric mean change" and suggests that we characterize uncertainty using either Anderson 2019 or Vericat 2017 approaches.
EDO Response:
EDO Response: We agree with this advice and have several ideas for how to address it. <u>Methodological Details</u>: We will present a more thorough description of how the LiDAR contractor collected, verified, and post-processed the data. <u>Systematic Error</u>: We will test for residual systematic error in our post-processed LiDAR by showing year-to-year elevation changes at known stable points (Figure 1). Year-to-year elevation change on interstates and other stable features should be very small and normally distributed around zero. We will also investigate magnitudes of error where in-channel vegetation changed year-to-year based on Brasington's comment that the conversion from vegetation height to bare-earth elevation may be prone to systematic errors.
2. Lateral Erosion Delineation Method
We asked reviewers to consider whether our method of separating lateral erosion from bed aggradation/degradation was appropriate. While most found the method appropriate, Williams asked that we evaluate how the method works compared to "expert manual interpretation" as used in Wheaton et al. 2013.
EDO Response:
We will address this by comparing our more automated method of hydraulic model result differencing with the Wheaton method on two small reaches of river in order to validate the automated method. Staff will independently delineate lateral erosion by hand using differenced rasters and aerial imagery, after first reviewing a manually delineated test reach. The test reach will help the staff agree upon the process and definitions, while the independent delineation will allow an examination of the effect of individual bias in manual interpretation. Areas of hand delineated lateral erosion will be compared with the area delineated in our report. We expect to visually compare the locations and intensity of lateral erosion predicted by our systematic remote sensing process and the manual interpretation. We will also quantify and compare the volumes predicted by both methods.
3. Analyze the North Channel as a control reach
Williams suggested we conduct geomorphic analyses (wetted width, sinuosity, longitudinal profiling, etc.) on the north channel to serve as a comparison to the J2 Channel. The reasoning behind the suggestion is that these two branches of the same river have many similarities, but

only the J2 Channel has been impacted by the hydropower return, so the North Channel may act as a "control reach".
EDO Response:
While we agree that further examination of the North Channel would be interesting, we do not predict that it would add meaningfully to the conclusions of our report. This is mainly because the North Channel and J2 Channel differ not only in sediment inputs (clearwater return vs. natural regime) but also in flow variation and magnitude. For decades, the J2 Channel has experienced little variation in flow while the North Channel has experienced frequent very low flows and several floods (Figure 2). If the North Channel represented the J2 channel but with a natural sediment regime (i.e., no clearwater discharge), then comparisons between the wetted width, sinuosity, longitudinal profiles, and other variables between the two channels would provide helpful information on the impact of the changes in sediment transport regime since the beginning of J2 Return flows. However, we propose that the North Channel is in practice a poor control to isolate the impact of sediment transport differences.
4. Volume Change Analysis
Brasington and Williams commented on our approach to summing bed volume change in each region to compute net change rather than providing the raw values of aggradation and degradation similar to Vericat, 2017. Williams suggested that it would be "beneficial to more extensively segregate erosion and deposition."
EDO Response:
We are currently uncertain of what the benefit of this segregated accounting would be for our stakeholders. To address a different comment from Brasington we are planning to add more figures of year-to-year LiDAR differenced rasters (Figure 3). We believe these additional figures may also help to add context to our "net change" values by visually depicting the areas of aggradation and degradation on the channel bed.

All other comments provided by each peer reviewer can be read in full in **Appendix D**. Specific comments have been pulled out into a matrix spreadsheet in **Appendix E** and organized by Reviewer (alphabetical), Comment Number, Type, Topic, Chapter, Page, Line, Comment/Paraphrase, and Proposed EDO Response. Each comment is included fully or is paraphrase to save space, and a proposed response from the EDO is provided for further discussion with the TAC.

Additional References Suggested by Peer Reviewers

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Appendices (included as separate documents in the PDF portfolio):

Appendix A – Sediment Augmentation Data Synthesis Compilation, As Reviewed

Appendix B – Peer Review Scope of Work

Appendix C – Peer Review Candidate Report

Appendix D – Individual (3) Peer Review Comments (Combined)

Appendix E – Peer Review Comment Matrix