# **Scientific writing**

### Lecture 6: Revision and peer review process; Issues in Scientific writing

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### Writing the first draft



### **1. Tables and Figures**

- They are the foundation of your story!
- Editors, reviewers, and readers may look first (and maybe only) at titles, abstracts, and tables and figures!
- Figures and tables should stand alone and tell a complete story. The reader should not need to refer back to the main text.
- Use the fewest figures and tables needed to tell the story.
- Do not present the same data in both a figure and a table.



### 2. Results

#### • ≠ Raw data

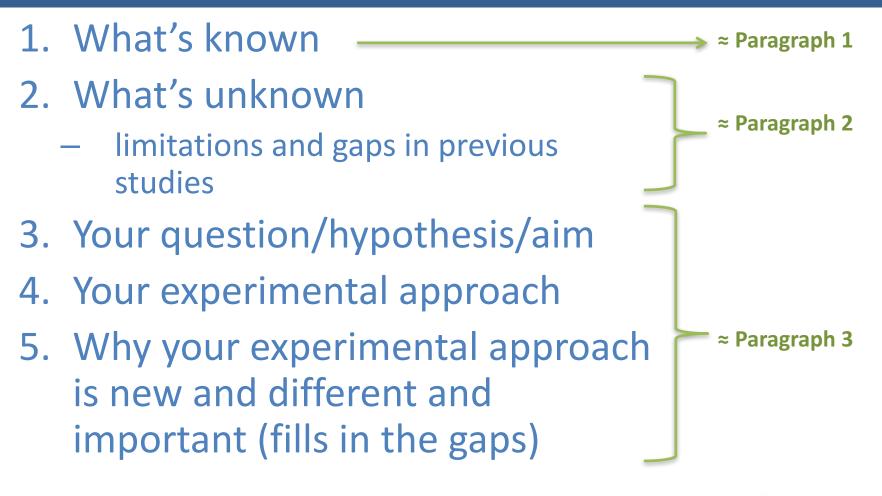
- Avoid simply repeating the numbers that are already available in tables and figures.
- Repeat/highlight only the most important numbers
- Summarize what the data show
  - Point out simple relationships
  - Describe big-picture trends
  - Cite figures or tables that present supporting data



### 3. Methods

- Give a clear overview of what was done
- Give enough information to replicate the study (like a recipe!)
- Be complete, but make life easy for your reader!
  - Break into smaller sections with subheadings
  - Cite a reference for commonly used methods
  - Display in a flow diagram or table where possible
- You may use jargon and the passive voice more liberally in the methods section

### **4. Introduction**



Corresponds to roughly 3 paragraphs...



### 5. Discussion

- Showcase good writing!
  - Use the active voice
  - Tell it like a story
- Start and end with the main finding
  - "We found that..."
- Don't travel too far from your data
  - Focus on what your data do prove, not what you had hoped your data would prove
- Focus on the limitations that matter, not generic limitations
- Make sure your take-home message is clear and consistent



# 6. Abstract and 7. Conclusion

- 1. Background
- 2. Question/aim/hypothesis
  - "We asked whether," "We hypothesized that,"...etc.
- 3. Experiment(s)
  - Quick summary of key materials and methods
- 4. Results
  - Key results found
  - Minimal raw data (prefer summaries)
- 5. Conclusion: The answer to the question asked/take- home message
- 6. Implication, speculation, or recommendation



Mimi Zeiger. Essentials of Writing Biomedical Research Papers, McGraw Hill Professional, 1999

### 8. References

- Use a computerized bibliographic program.
- Follow journal guide lines (may request alphabetical listing or order of appearance in the text).
- Some journals limit number of references allowed (e.g., 30); figure this out ahead of time!
- Follow journal formatting rules (see: instructions to authors).



### **Revision, revision and revision...**



### **Example on revision**

Headache is an extraordinarily common pain symptom that virtually everyone experiences at one time or another. As a pain symptom, headaches have many causes. The full range of these causes were categorized by the International Headache Society (IHS) in 1988. The IHS distinguishes two broad groups of headache disorders: primary headache disorders and secondary headache disorders. Secondary headache disorders are a consequence of an underlying condition, such as a brain tumor, a systemic infection or a head injury. In primary headache disorders, the headache disorder is the fundamental problem; it is not symptomatic of another cause. The two most common types of primary headache disorders are episodic tension-type headache (ETTH) and migraine. Although IHS is the most broadly used/recognized classification system used, a brief comment on others would be appropriate – especially if there are uses that have epidemiologic advantages.

# verb-tally

to be: 8; to have: 2; passive verbs: 1; others -> experiences, distinguishes

Headache is an extraordinarily common pain symptom that virtually everyone experiences at one time or another. As a pain symptom, headaches have many causes. The full range of these causes were categorized by the International Headache Society (IHS) in 1988. The IHS distinguishes two broad groups of headache disorders: primary headache disorders and secondary headache disorders. Secondary headache disorders are a consequence of an underlying condition, such as a brain tumor, a systemic infection or a head injury. In primary headache disorders, the headache disorder is the fundamental problem; it is not symptomatic of another cause. The two most common types of primary headache disorders are episodic tension-type headache (ETTH) and migraine. Although IHS is the most broadly used/recognized classification system used, a brief comment on others would be appropriate – especially if there are uses that have epidemiologic advantages.

# wordiness tally

Headache is an extraordinarily common pain symptom that virtually everyone experiences at one time or another. As a pain symptom, headaches have many causes. The full range of these causes were categorized by the International Headache Society (IHS) in 1988. The IHS distinguishes two broad groups of headache disorders: primary headache disorders and secondary headache disorders. Secondary headache disorders are a consequence of an underlying condition, such as a brain tumor, a systemic infection or a head injury. In primary headache disorders, the headache disorder is the fundamental problem; it is not symptomatic of another cause. The two most common types of primary headache disorders are episodic tension-type headache (ETTH) and migraine. Although IHS is the most broadly used/recognized classification system used, a brief comment on others would be appropriate – especially if there are uses that have epidemiologic advantages.

### Watch repetition

Headache is an extraordinarily common pain symptom that virtually everyone experiences at one time or another. As a pain symptom, headaches have many causes. The full range of these causes were categorized by the International Headache Society (IHS) in 1988. The IHS distinguishes two broad groups of headache disorders: primary headache disorders and secondary headache disorders. Secondary headache disorders are a consequence of an underlying condition,

> Repetition can sometimes help transitions, but here it is just (too much) repetitive.



### avoid meta-comment

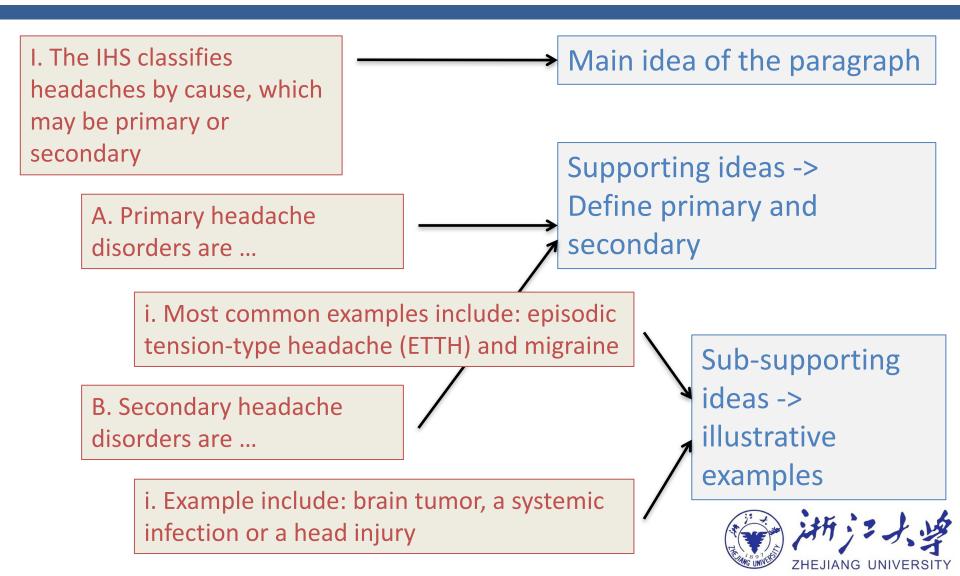
Headache is an extraordinarily common pain symptom that virtually everyone experiences at one time or another. As a pain symptom, headaches have many causes. The full range of these causes were categorized by the International Headache Society (IHS) in 1988. The IHS distinguishes two broad groups of headache disorders: primary headache disorders and secondary headache disorders. Secondary headache disorders are a consequence of an underlying condition, such as a brain tumor, a systemic infection or a head injury. In primary headache disorders, the headache disorder is the fundamental problem; it is not symptomatic of another cause. The two most common types of primary headache disorders are episodic tension-type headache (ETTH) and migraine. Although IHS is the most broadly used/recognized classification system used, a brief comment on others would be appropriate – especially if there are uses that have epidemiologic advantages.

# **Outline ideas**

Headache is an extraordinarily common pain symptom that virtually everyone experiences at one time or another. As a pain symptom, headaches have many causes. The full range of these causes were categorized by the International Headache Society (IHS) in 1988. The IHS distinguishes two broad groups of headache disorders: primary headache disorders and secondary headache disorders. Secondary headache disorders are a consequence of an underlying condition, such as a brain tumor, a systemic infection or a head injury. In primary headache disorders, the headache disorder is the fundamental problem; it is not symptomatic of another cause. The two most common types of primary headache disorders are episodic tension-type headache (ETTH) and migraine. Although IHS is the most broadly used/recognized classification system used, a brief comment on others would be appropriate – especially if there are uses that have epidemiologic advantages.



### Idea flow chart (outline)



### Sentence-level editing

Headache is an extraordinarily common pain symptom that virtually everyone experiences at one time or another. As a pain symptom, headaches have many causes. The full range of these causes were categorized by the International Headache Society (IHS) in 1988. The IHS distinguishes two broad groups of headache disorders: primary headache disorders and secondary headache disorders.



### Main Idea

### $\rightarrow$

Headache is a pain symptom that almost everyone experiences. The International Headache Society (IHS) groups headaches into two types based on cause: primary headache disorders and secondary headache disorders.

I. The IHS classifies headaches by cause, which may be primary or secondary



Main idea of the paragraph

### **Supporting ideas**

Secondary headache disorders are a consequence of an underlying condition, such as a brain tumor, a systemic infection or a head injury. In primary headache disorders, the headache disorder is the fundamental problem; it is not symptomatic of another cause. The two most common types of primary headache disorders are episodic tension-type headache (ETTH) and migraine

Unnecessary repetition

Effect ← cause Illogical order! Avoid, if possible.

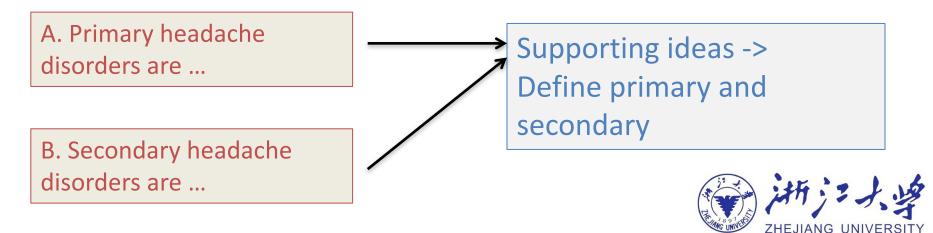
Empty words

Also, consider ordering: first (primary), then second (secondary)

### **Edited version**

### $\rightarrow$

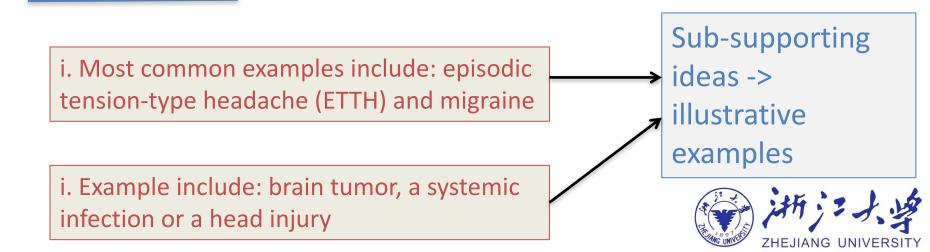
In primary headache disorders, the headache itself is the main complaint. The two most common types of primary headache disorder are episodic tension-type headache (ETTH) and migraine. Secondary headache disorders result from an underlying condition, such as a brain tumor, a systemic infection, or a head injury.



### **Edited version**

### $\rightarrow$

In primary headache disorders, the headache itself is the main complaint. The two most common types of primary headache disorder are episodic tension-type headache (ETTH) and migraine. Secondary headache disorders result from an underlying condition, such as a brain tumor, a systemic infection, or a head injury.

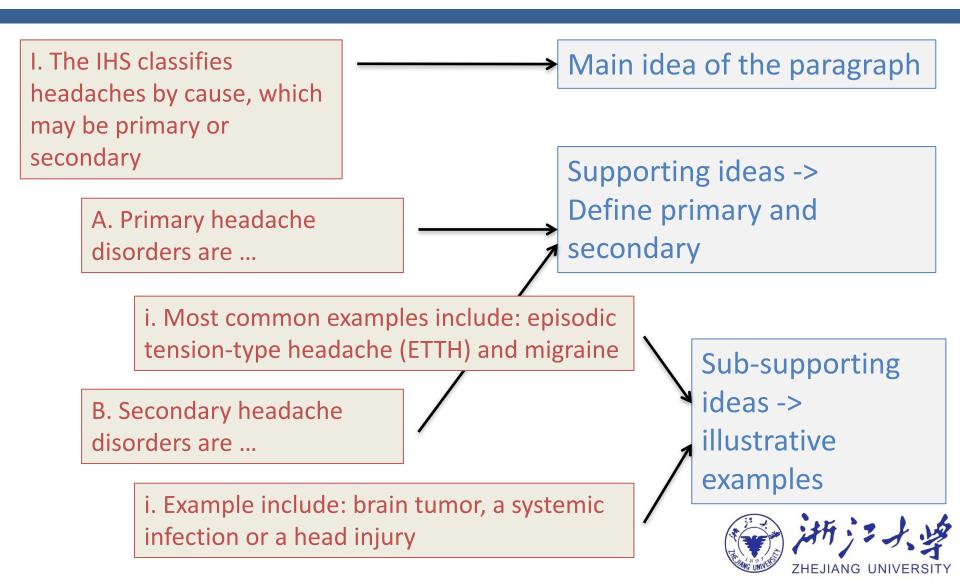


### Altogether

Headache is a pain symptom that almost everyone experiences. The International Headache Society (IHS) groups headaches into two types based on cause: primary headache disorders and secondary headache disorders. In primary headache disorders, the headache itself is the main complaint. The two most common types of primary headache disorder are episodic tension-type headache (ETTH) and migraine. Secondary headache disorders result from an underlying condition, such as a brain tumor, a systemic infection, or a head injury.



### Check with outline



### **Submission process**

- 1. Identify a journal for submission (ideally before writing!)
- 2. Follow the online "instructions for authors" for writing and formatting the manuscript: text, figures, tables, references, etc...
- 3. Submit your manuscript online (corresponding author)
- 4. Possible outcomes:
  - accepted;
  - accepted pending minor revisions;
  - moderate or major revisions;
  - rejected but re-submission possible;
  - no resubmission possible
- 5. Revision and resubmission: re-submit with cover letter that addresses reviewers critiques point by point
- 6. Once accepted, carefully review final proofs!



### Carefully review final proofs!

**MARCH 2014** 

CORRIGENDUM

#### CORRIGENDUM

YEPING YUAN AND ALEXANDER R. HORNER-DEVINE

Civil and Environmental Engineering, University of Washington, Seattle, Washington

There is a critical error in the abstract of Yuan and Horner-Devine (2013). In the eighth line of the abstract, the word "decreases" should be "increases." The corrected sentence should read as "Later spreading increases the average plume density relative to laterally confined currents with similar inflow conditions."

The authors regret any inconvenience this error may have caused.

#### REFERENCE

Yuan, Y., and A. R. Horner-Devine, 2013: Laboratory investigation of the impact of lateral spreading on buoyancy flux in a river plume. J. Phys. Oceanogr., 43, 2588–2610, doi:10.1175/JPO-D-12-0117.1.

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### Major revision / Resubmission

"Your manuscript is not acceptable for publication (at current stage) ... However, if you feel that you can suitably address the reviewers' comments, then I invite you to revise and resubmit your manuscript."



### **Response to editor/reviewers**

- Dear Dr. Editor,
- We appreciate your helpful comments and those of the reviewers.
- We feel that the manuscript is now greatly improved.
- We have made revisions based on the comments/suggestions of Reviewers I and II. The comments of each reviewer are numbered below, with our response (clarifications and changes) following.



### **Response to reviews cont'd**

#### Reviewer I:

1. There is little discussion of xxx

We agree with Reviewers I and II that the section on xxx was too abbreviated. Therefore, we have added a paragraph that highlights xxx (paragraph 33).

2. Could you comment on xx

We have added a sentence to paragraph 9 in Methods/Materials that comments on xx



### Include a copy of paper with changes tracked

Headache is <u>a</u> pain symptom that <u>almost</u> everyone experiences. The International Headache Society (IHS) groups headache<u>s into two types based on</u> <u>cause</u>: primary headache disorders and secondary headache disorders. Yeping Yuan Deleted: an extraordinarily

Yeping Yuan Deleted: common

Yeping Yuan Deleted: virtually

Yeping Yuan Deleted: at one time or another

Yeping Yuan Deleted: As a pain symptom, headaches have many causes.

Yeping Yuan Deleted: full range of these causes were categorized by the

Yeping Yuan Deleted: in 1988. The IHS distinguishes two broad

Yeping Yuan Deleted: of

Yeping Yuan Deleted: disorders



### **Peer Review**

- Comments to authors
- Peer Review ≠ Revision
- Peer Review ≠ Copy Editor
  - Do not spend your time nit-picking
  - Focus on big-picture issues
  - If the manuscript has a lot of copy-editing errors, point this out in a general way and give one or two examples
    - The manuscript contains typos, such as ..





• Tone matters!

 The authors should delete table 5; not only is it completely irrelevant, but it also reveals their utter lack of statistical understanding

 Table 5 contains unnecessary information (for example...), and a Pearson's correlation coefficient may not be appropriate here. The authors should consider revising or omitting the table.



### Tone

- Avoid criticizing the authors! Criticize the work.
- Avoid generalizations; point out specific errors.
- Use positive instead of negative language where possible: "The paper is poorly written." vs. "The writing and presentation could be improved. For example..."
- Avoid "lecturing" to the authors.



### **Suggested process**

- 1. Scan the abstract.
- 2. Jump to the data: review the tables and figures first.
  - Draw your own conclusions.
  - Do the tables and figures stand on their own? Are there any obvious statistical errors?
  - Is there repetitive information?
- 3. Read the paper once through.
  - Do the authors conclusions match their data?
  - Is the paper clearly written, or did you struggle to get through it? You should not have to struggle!
  - Is the length of the paper justified given the amount of new information that the data provide?



### Process

#### 4. Read the introduction carefully.

- Is it sufficiently succinct?
- Does it roughly follow: known-->unknown-->research question/hypothesis?
- Is there a clear statement of the hypotheses or aim of the study?
- Is there detailed information about what was done that belongs in the methods?
- Is there information about what was found that belongs in results?
- Is there distracting information about previous studies or mechanisms that are not directly relevant to the hypothesis being tested. If so, it should be moved to the discussion.
- Do the authors tell you what gaps in the literature they are trying to fill in?

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5. Method -> Result -> Table/Figure -> Discussion

### Content

- 1. Start with a one-paragraph "general overview."
- State what you think is the major finding and importance of the work
- Give 2-3 positive, encouraging statements about the work. If the methods are problematic, is the writing nice, for example? Is the research question particularly interesting or novel? (E.g., "This is an interesting manuscript, with several strengths." "The authors should be commended for ..." "The finding that XX is important.)
- State 1-2 major limitations (if there are any) to the study design, writing/presentation, or conclusions. (E.g., "The study is limited because there is no control group." "The overall writing or presentation needs improvement." "The authors may have overstated their findings." "The paper provides only weak evidence for its conclusions." "The study is exploratory, not hypothesis-driven.")

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### Content

### 2. In a numbered list

Give 5-15 specific criticisms/suggestions for revision. The number will often correspond to your recommendation (give the most if you are recommending "opportunity for revision.")

- Point out specific mistakes.
- List the issues that you found in your review.
- Give specific recommendations for revision.



### Sample review and response

#### 1 Title

2 Intrusion of Rhone River diluted water into the Bay of Marseille: generation processes and

- 3 impacts on ecosystem functioning
- 4

#### 5 Authors

- Marion FRAYSSE<sup>1,2,\*</sup>, Ivane Pairaud<sup>1</sup>, Oliver N. Ross<sup>2</sup>, Vincent M. Faure<sup>2</sup> and Christel
  Pinazo<sup>2,\*</sup>
- 8
- 9 <sup>1</sup> Institut Français de Recherche pour l'Exploitation de la Mer, Laboratoire Environnement
- 10 Ressources Provence Azur Corse, BP 330, F-83507, La Seyne sur Mer, France
- 11 <sup>2</sup> Aix Marseille Université, CNRS/INSU, IRD, Mediterranean Institute of Oceanography
- 12 (MIO), UM 110, 13288 Marseille, France
- 13 Université de Toulon, CNRS/INSU, IRD, Mediterranean Institute of Oceanography (MIO),
- 14 UM 110, 83957 La Garde, France
- 15 <sup>\*</sup>Corresponding authors: marion.fraysse@univ-amu.fr, christel.pinazo@univ-amu.fr
- 16

#### 17 Key Points

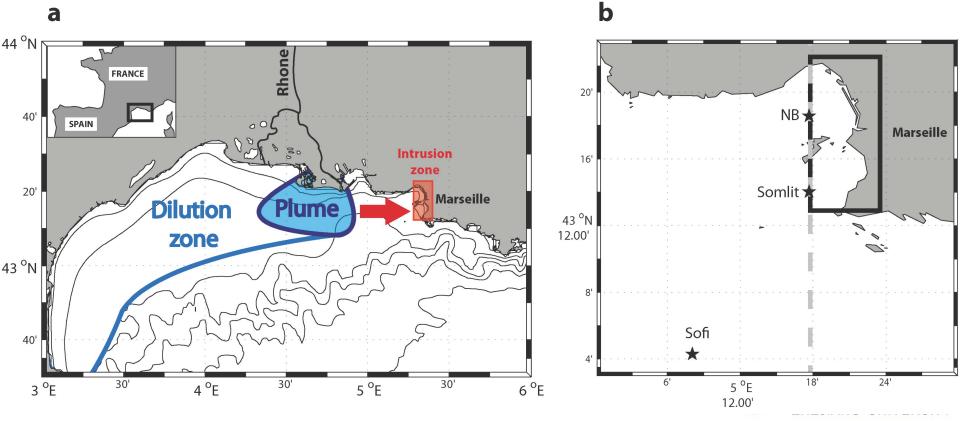
- 18 Rhone River intrusions into the Bay of Marseille were modeled
- 19 Rhone river intrusions are characterized based on their generation mechanisms
- 20 Rhone intrusions are of high ecological significance for the Bay of Marseille

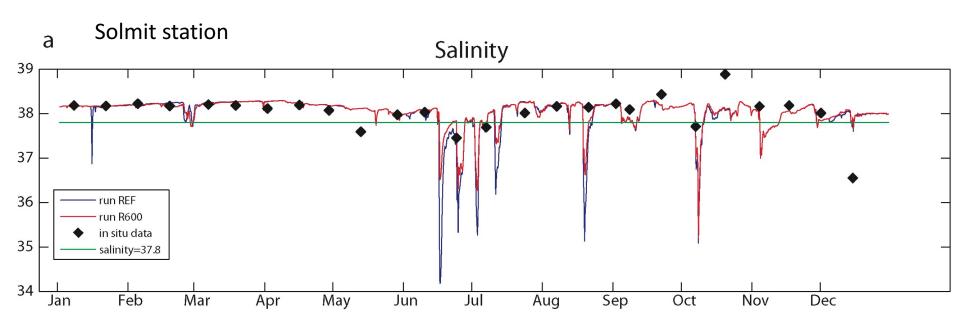


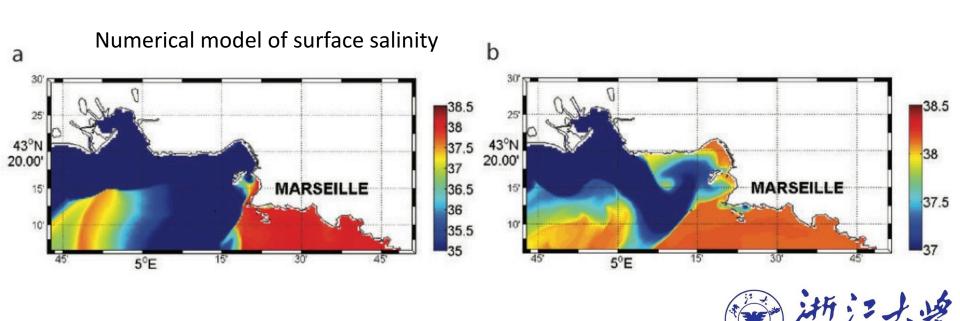
### Sample review and response

#### Title

Intrusion of Rhone River diluted water into the Bay of Marseille: generation processes and impacts on ecosystem functioning

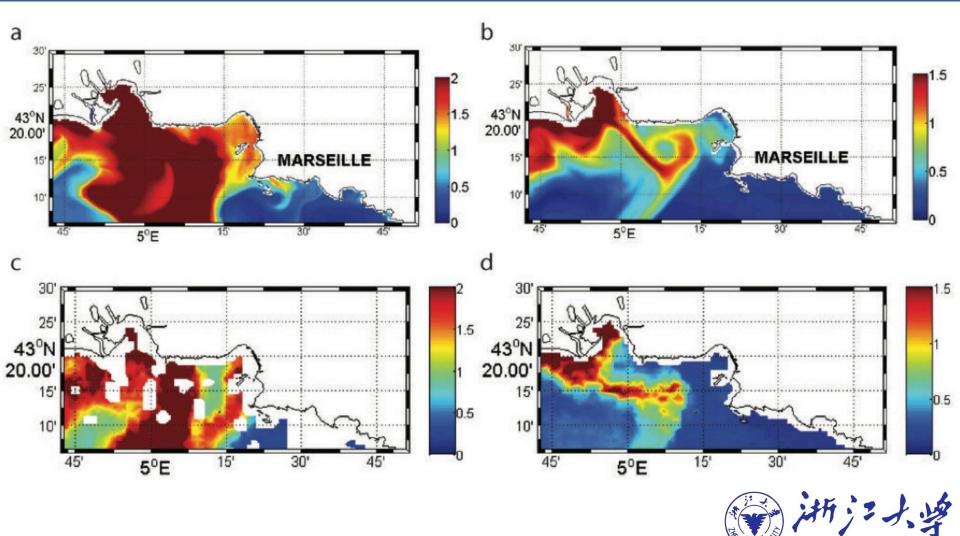




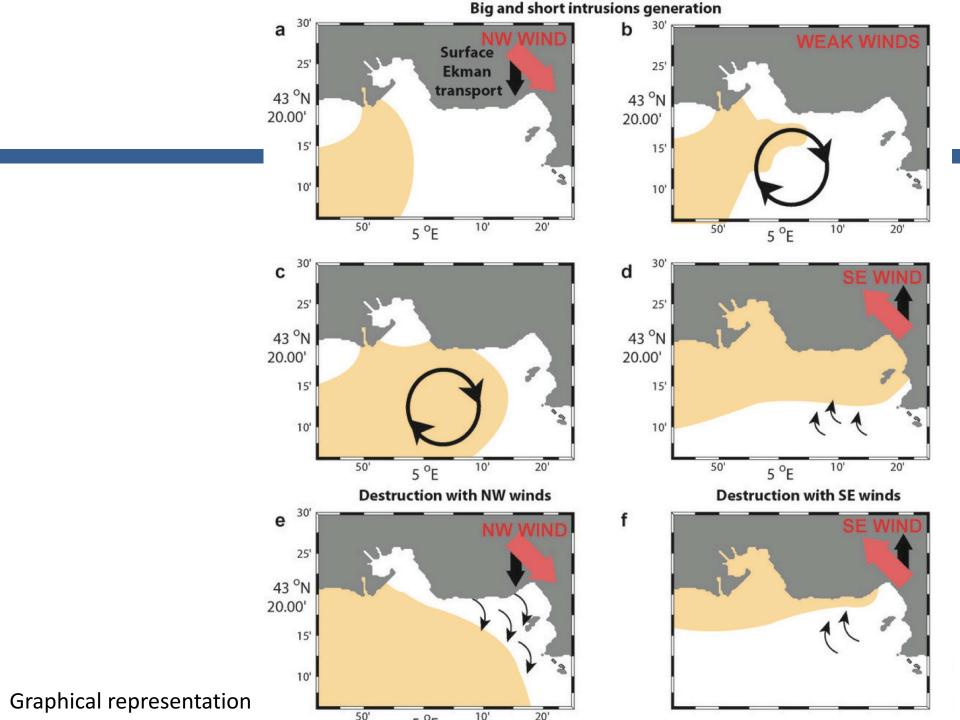


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#### Numerical model (upper) and satellite observation (lower) of surface Chla concentration



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#### Answers to reviewers

### "Intrusion of Rhone River diluted water into the Bay of Marseille: generation processes and impacts on ecosystem functioning" [Paper #2014JC010022]

The authors thank the two anonymous reviewers for their helpful comments. Most of the suggestions arising from the reviewing procedure have been thoroughly addressed. The line numbers are given for the "track changes" version of the manuscript.

### General overview + 2-3 positive statements

### **Reviewer #1 (Comments to Author):**

The authors present analysis of model results regarding the Rhone plume and its intrusion into the Bay of Marseille. The model has realistic hindcast hydrodynamics, and biogeochemistry.

The analysis is well done, and the writing is clear. The figures need some work, as detailed below. However, in order to be publishable the authors need to do a better job:



### 2-3 major limitation

(i) motivating the importance of studying biogeochemistry in the Bay of Marseille, A paragraph was added in the introduction (lines 75-85).

### (ii) quantifying the plume biogeochemical effects in the Bay, and

The explanation of the mass budgets was improved based upon the reviewer's advice (see details below) and the corresponding figure (Fig 9) redrawn.

## (iii) connecting the physical scenario that sends plume water to the Bay to other river plumes around the world.

Some connections with other plume studies were added to the discussion (lines 743-751 and lines 800-805)



### Numbered list (detailed comments)

#### **Detailed comments:**

Lines 98-177. Another recent large plume study the authors may want to compare to is from the RISE project which studied the Columbia River plume. A good overview is presented in Hickey, B. M., R. M. Kudela, J. D. Nash, K. W. Bruland, W. T. Peterson, P. MacCready, E. J. Lessard, D. A. Jay, N. S. Banas, A. M. Baptista, E. P. Dever, P. M. Kosro, L. K. Kilcher, A. R. Horner-Devine, E. D. Zaron, R. M. McCabe, J. O. Peterson, P. M. Orton, J. Pan, and M. C. Lohan (2010) River Influences on Shelf Ecosystems: introduction and synthesis. J. Geophys. Res., 115, C00B17, doi:10.1029/2009JC005452. This citation was added (line 688).

#### Line 111. Mention that 37.8 is salinity.

Done (line 124).

### Line 178. A few more sentences about the model forcing would be helpful (atmosphere, ocean, tides?).

We added a brief description of the different components that contribute to the model forcing and added two references that contain a more detailed description (lines 128 + 204) is a second secon

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### Line 245. What is the meaning of the parameters a and b?

The full definition is rather complex and lengthy which is why we had only referenced Nencioli et al (2010) at L. 285 where a very detailed explanation can be found. The first parameter, a, defines how many grid points away the increases in magnitude of y along the EW axes and u along the NS axes are checked. It also defines the curve around the eddy center along which the change in direction of the velocity vectors is inspected. The second parameter, b, defines the dimension (in grid points) of the area used to define the local minimum of velocity.

Section 2.2.4. The B equations took me a while to understand. It might be helpful to use explicit area or volume integrals to first define terms, and then time integrals to define the cumulative terms. Also, when B^STOCK is plotted in Fig. 11 it starts from 0, so I assume the initial stock is subtracted. This could be made clearer.

Line 274. Do you mean "ocean" instead of "riverine?"

The symbol B does indeed indicated the change in standing stock, it is in fact a dM/dt where M is the mass of substances. We have completely re-written and expanded the section introducing the mass budgets (Sec. 2.2.3, expansion with more detail in new Appendix B) and also added a new table (Tab. 1). We paid attention to better define all terms in the equations and to use integrals as suggested. We paid attention to better define all terms in the equations and to use integrals as suggested. Hopefully this will make it clearer.



**\*\*** Figures: in any resubmission please format the figures with captions on the same page. This makes it much easier for the reviewer. **\*\*** 

**Fig. 1. Please mark the model domain on the figure.** Figure 1 was modified to include the model domain.

Fig. 2. It would be easier to read this if you used a legend so that the reader could see what the lines meant without having to look at the caption. In the Depth axis label give the units. The Depth label in (b) is not needed.

The figure 2 was deleted (see our reply to a comment by reviewer #2)

**Fig. 4. The SOM analysis does not reveal anything that is not already better conveyed by Table 2. I suggest dropping it entirely. The paper could do with shortening in any case.** The SOM analysis and the figure 4 was moved in Appendix A. The figure 4 was renamed figure A1.



### Homework

- 1. Write peer review comments to authors
  - Remember to use the suggested format
  - As if you are reviewing a scientific manuscript
- 2. Provide specific revisions
  - Use word track-change tool
  - As if you are a colleague who helps to improve the paper writing

Due 01/24 (Wednesday) No extension!



# Plagiarism of others' work

- Passing off other people's writing (or tables and figures) as your own, including
  - cutting and pasting sentences or even phrases
  - from another source
  - slightly rewriting or re-arranging others' words
     "borrowing" material from sites like Wikipedia



# Example

From Sainani course

• Original Version (Wikipedia):

Ernest Miller Hemingway (July 21, 1899– July 2, 1961) was an American author and journalist. His economical and understated style had a strong influence on 20th- century fiction, while his life of adventure and his public image influenced later generations. (Source: Wikipedia)

• Plagiarized Version:

Ernest Hemingway's thrifty and understated style strongly influenced 20th- century fiction. His audacious lifestyle and public image also influenced later generations.



## How to avoid plagiarism

- When writing about others' ideas/work:
  - You must understand the material well enough to put it in your own words!
  - Work from memory
  - Draw your own conclusions
  - Do not mimic the original author's sentence structure or just re-arrange the original author's words.



## **Self-plagiarism and duplication**

- Recycling your own writing or data, including:
  - Copying or only slightly rewriting text from your own previously published papers.
  - Adding new data to already published data and presenting it as new results.
  - Submitting identical or overlapping data to multiple journals.



# **Prevalence of plagiarism?**

 In pilot studies, publishers that used CrossCheck to look for plagiarism had to reject 6% to 23% of submitted papers (due to plagiarism or self- plagiarism/duplication).

Reference: Journals step up plagiarism policing. *Nature* **466**, 167 (2010).



# **Prevalence of plagiarism?**

2-year study of plagiarism in the Croatian Medical Journal (automatic detection software followed by manual confirmation):

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- 8% of papers plagiarized others' work
- 3% of papers were self-plagiarized

Reference:

Baždarić K, et al. Prevalence of plagiarism in recent submissions to the *Croatian Medical Journal*. *Sci Eng Ethics*. 2012 Jun;18(2):223-39

# **Prevalence of plagiarism?**

Study of plagiarism in residency applications:

- Using plagiarism detection software, researchers analyzed about 5000 personal statements in applications to five residency programs at Brigham and Women's Hospital.
- 5% of essays had clear evidence of plagiarism (confirmed on manual review).

Reference:

Segal S, et al. Plagiarism in Residency Application Essays. Ann Intern Med. 20 July 2010;153(2):112-120.



# Example

From Sainani course

• Original passage (Klibanski et al. 1995):

"Our data demonstrate that, despite its usefulness in perimenopausal women, estrogen and progestin administration does not reverse the profound osteopenia seen in all young women with anorexia nervosa. Trabecular bone loss is severe and may progress despite estrogen therapy."

• Plagiarized passage (Munoz et al. 2002):

"In conclusion, our data demonstrate that, despite its usefulness in perimenopausal women, estrogen and progestin administration does not reverse the profound osteopenia seen in all young women with AN. Trabecular bone loss is severe and may progress despite estrogen therapy."

## **Another example**

From Sainani course

### • Original paper (2004):

"Although earlier registry-based analyses of second neoplasms after breast cancer (BC) did not detect an increased risk of cutaneous melanoma (CM),[1][2] several more recent registrybased[3][4] and hospital- based[5] studies have documented a statistically significant increased risk of CM after BC with standardized incidence ratios (SIRs) ranging from 1.4 to 2.7."

### • Second paper (2009):

"Recent registry-based [1,2] and hospital-based [3,4] studies have documented a statistically significant increased risk of CM after BC with standardized incidence ratios (SIRs) ranging from 1.4 to 2.7."

References 1,2,3,4 are identical!

