Scientific writing

Lecture 3: The original manuscript

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Review of Lecture 2 homework

Find a research (can be SRTP) or an experiment (you've done in previous courses), write an outline in order to prepare a manuscript.

- List 3 goals (your proposed answers)
- List 3 key papers that provide foundation of your work
- List 3 main ideas in the introduction
- List 3 main findings of your study
- List possible comparisons/discussions

Outline

- I. Introduction
  - 1.0 Opening paragraph
  - 1.1 Background (pubs)
    - 1.1.1 Observational background
    - 1.1.2 Theoretical background
    - 1.1.3 Modeling background (pubs)
  - 1.2 Present research
- II. Methodology
- III. Results
- IV. Summary and discussion

Outline

- II. Methodology
  - 2.1 Data
  - 2.2 Models
    - 2.2.1 Model basics (equations, etc.)
    - 2.2.2 Forcing field
    - 2.2.3 Basin, resolution, and boundary conditions
    - 2.2.4 Initial conditions
    - 2.2.5 Output sampling and averaging

Outline

- III. Results
  - 3.1 Main run
    - 3.1.1 Mean state
    - 3.1.2 Seasonal variability
    - 3.1.3 Interannual variability
  - 3.2 Sensitivity to winds
  - 3.3 Sensitivity to mixing
  - …

Outline

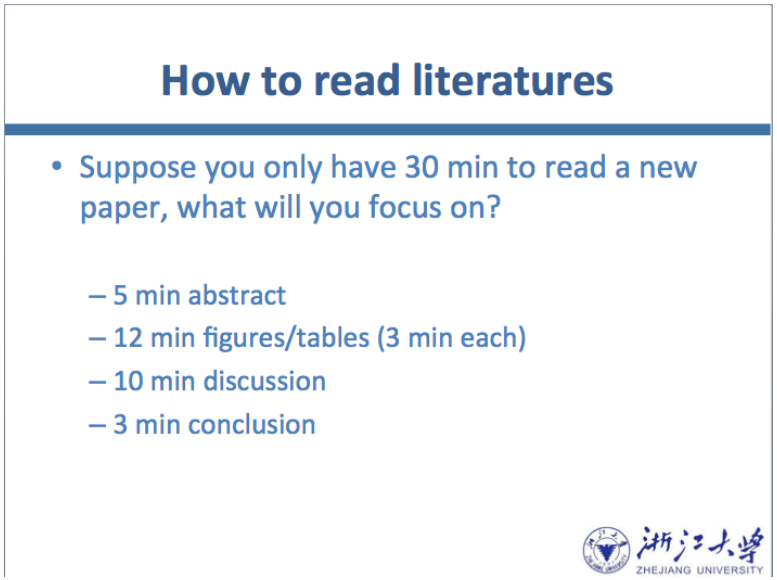
- IV. Summary and discussion
  - 4.1 Summary
  - 4.2 Discussion
    - 4.2.1 Unresolved issues
    - 4.2.2 Future work

Note: Avoid ending a paper with a list of weaknesses of the research.

Recommended order for writing an original manuscript

0. Tables and Figures
1. Results
2. Methods
3. Introduction
4. Discussion
5. Conclusion
6. Abstract

- Contents
- Samples
- Tips



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How to find a strong title for your paper?

- A strong title offers two things:
  - 1) the topic of the research;
  - 2) its unique identity that is different from all other papers in the field.
- Test: Does it stand out from a “google” search?

How to find a strong title for your paper?

- Being precise (using the right words and appropriate level of accuracy);
- Using no more than three or four details;
- Avoiding being too long;
- Avoiding unfamiliar abbreviations.

River plumes as a source of large-amplitude internal waves in the coastal ocean

Satellite Measurements Reveal Persistent Small-Scale Features in Ocean Winds

Eddy/Wind Interactions Stimulate Extraordinary Mid-Ocean Plankton Blooms

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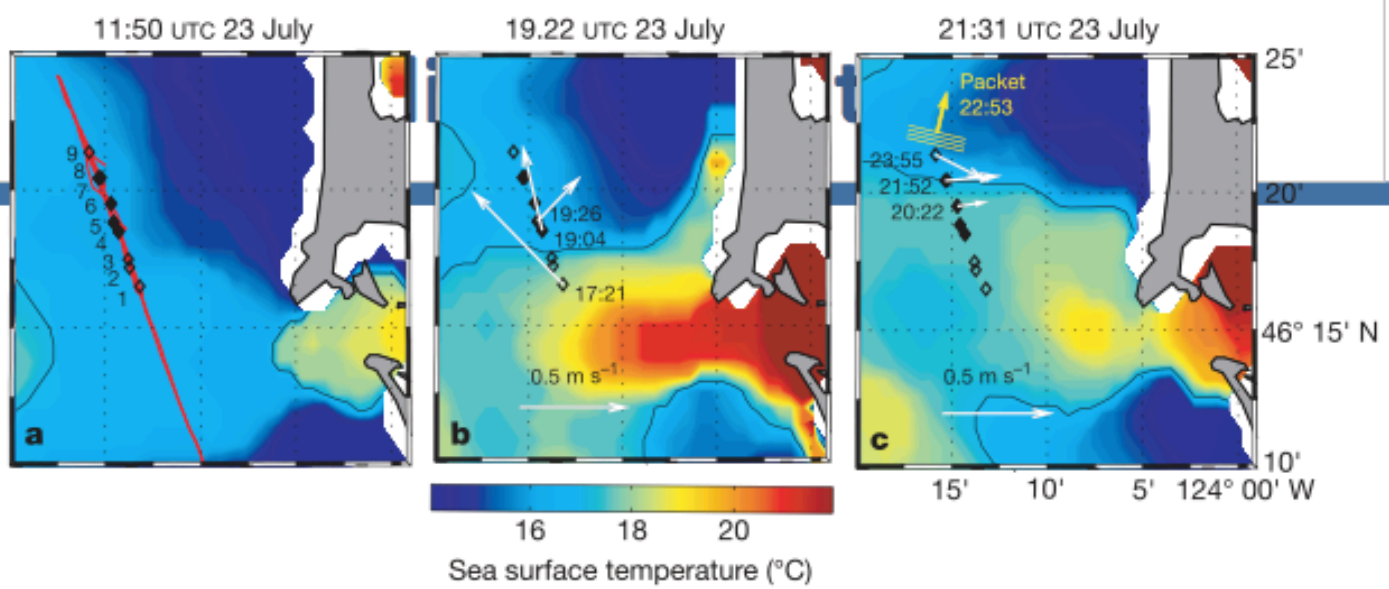

Figure 2 | Progression of the Columbia River plume from satellite-derived SST images. Times (23 July 2004 UTC) are 11:50 (**a**), 19:22 (**b**) and 21:31 (**c**). Red line in left panel is ship track. Diamonds show locations where plume front was crossed; filled diamonds correspond to the four crossings presented in Fig. 3. Near-surface fluid velocities behind the plume front u_p at selected crossings are indicated in **b** and **c** (45-s average over $0\,m < z < 5\,m$); vectors are grouped to correspond to time of SST images. The 17 °C isotherm is contoured and represents the approximate front location. Location of the wave packet at 22:53 as imaged by shipboard X-band radar is shown in **c**.

- Figures and tables should stand alone and tell a complete story. The reader should not need to refer back to the main text.

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Tips on Tables and Figures

- Use the fewest figures and tables needed to tell the story.

- Do not present the same data in both a figure and a table.

  -> Choose Figure or Table

Tables vs. Figures

- **Figures**
  - Visual impact
  - Show trends and patterns
  - Tell a quick story
  - Tell the whole story
  - Highlight a particular result

- **Tables**
  - Give precise values
  - Display many values/variables

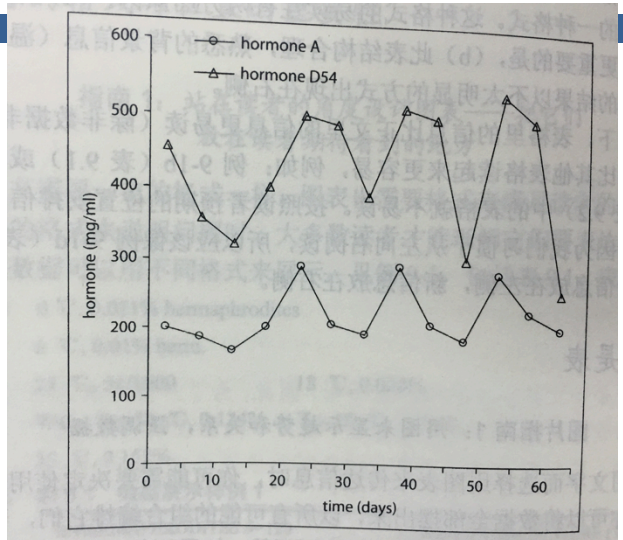

图 9.1　数据展示样例 B。以线图的方式展示例 9-2a 表中的数据。

表 9.4　数据展示样例 A

TIME (DAYS)	HORMONE A	HORMONE D54
0	200.5	455.8
5	187.1	356.7
10	166.5	321.9
15	201.1	400.6
20	289.8	500.7
25	204.1	489.9
30	189.9	389.4
35	288.9	513.4
40	205.1	499.3
45	182.9	298.5
50	278.8	533.2
55	223.4	498.5
60	199.6	250.6

Table Title

- Identify the specific topic or point of the table.
- Use the same key terms in the table title, the column headings, and the text of the paper
- Keep it brief!
- Example: “Descriptive characteristics of the two treatment groups, means ± SD or N (%)”

Table Format

- Model your tables from already published tables! Don't re-invent the wheel!!
- Most journals use three horizontal lines: one above the column headings, one below the column headings, and one below the data
- Use footnotes
  - to explain statistically significant differences:

    e.g., *p<.01 vs. control by ANOVA
  - to explain experimental details or abbreviations:

    e.g., EDI is the Eating Disorder Inventory (reference);

Example table

Table 1. Descriptive characteristics of the study groups, means ± SD or N (%).

Characteristic	Bad Witches	Good Witches
N	13	12
Age (yrs)	45 ± 5	36 ± 6*
Female	11 (85%)	10 (83%)
BMI (kg/m^2)	21 ± 6	23 ± 3
Systolic BP (mmHg)	140 ± 10	120 ± 9*
Exercise (min/day)	30 ± 20	60 ± 30*
Employment status		
Unemployed	4 (31%)	0 (0%)
Part time	3 (23%)	4 (33%)
Full time	6 (46%)	8 (66%)
Smoker (yes/no)	6 (50%)	0 (0%)*

*p<.05, ttest or Fisher's exact test, as appropriate.

Three horizontal lines

From "writing in the sciences" by Dr. Kristin Sainani

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What NOT to do!

Table 1. Descriptive characteristics of the study groups, means ± SD or N (%).

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Remove grid lines!

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Make sure everything lines up and looks professional!

What NOT to do!

Table 1. Descriptive characteristics of the study groups, means ± SD or N (%).

Characteristic	Bad Witches	Good Witches
N	13	12
Age (yrs)	45.076 ± 5.032	36.007 ± 6.032*
Female	11 (85%)	10 (83%)
BMI (kg/m^2)	21.223 ± 6.332	23.331 ± 3.333
Systolic BP (mmHg)	140.23 ± 10.23	120.23 ± 9.23*
Exercise (min/day)	30.244 ± 20.345	60.123 ± 30.32*
Employment status		
Unemployed	4 (31%)	0 (0%)
Part time	3 (23%)	4 (33%)
Full time	6 (46%)	8 (66%)
Smoker (yes/no)	6 (50%)	0 (0%)*

*p<.05, ttest or Fisher's exact test, as appropriate.

Use a reasonable number of significant figures

What NOT to do!

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*p<.05, ttest or Fisher's exact test, as appropriate.

Give units!

Omit unnecessary columns!

What NOT to do!

Table 1. Descriptive characteristics overall and by group, means ± SD or N (%), and p-values for the comparison between the groups.

Characteristic	Overall	Bad Witches	Good Witches	P-value
N				n/a
Age (yrs)				0.0005
Female				0.80
BMI (kg/m^2)				0.31
Systolic BP (mmHg)				0.0001
Exercise (min/d)				0.0069
Employment status				
Unemployed				0.17
Part time				
Full time				
Smoker (yes/no)				0.01

Table 1. Descriptive characteristics of the study groups, means ± SD or N (%).

Characteristic	Bad Witches	Good Witches
N	13	12
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*p<.05, ttest or Fisher's exact test, as appropriate.

Types of Figures

1. Primary evidence
   - Photographs, maps, raw picture data
   - Indicates data qualitatively
   - “Seeing is believing”
2. Graphs
   - Line graphs, bar graphs, scatter plots, histograms, boxplots, vector arrows, etc…
3. Drawings and diagrams
   - Illustrate and experimental setup or work flow
   - Illustrate cause and effect relationship or cycles
   - Give a hypothetical model
   - Cartoons

Figure Legends/Caption

** Allows the figure to stand alone!

May contain:

- Brief title
- Essential experimental details
- Definitions of symbols or line/bar patterns
- Explanation of panels (a, b, c, d…)
- Statistical information (tests used, p-values)

Example Legend

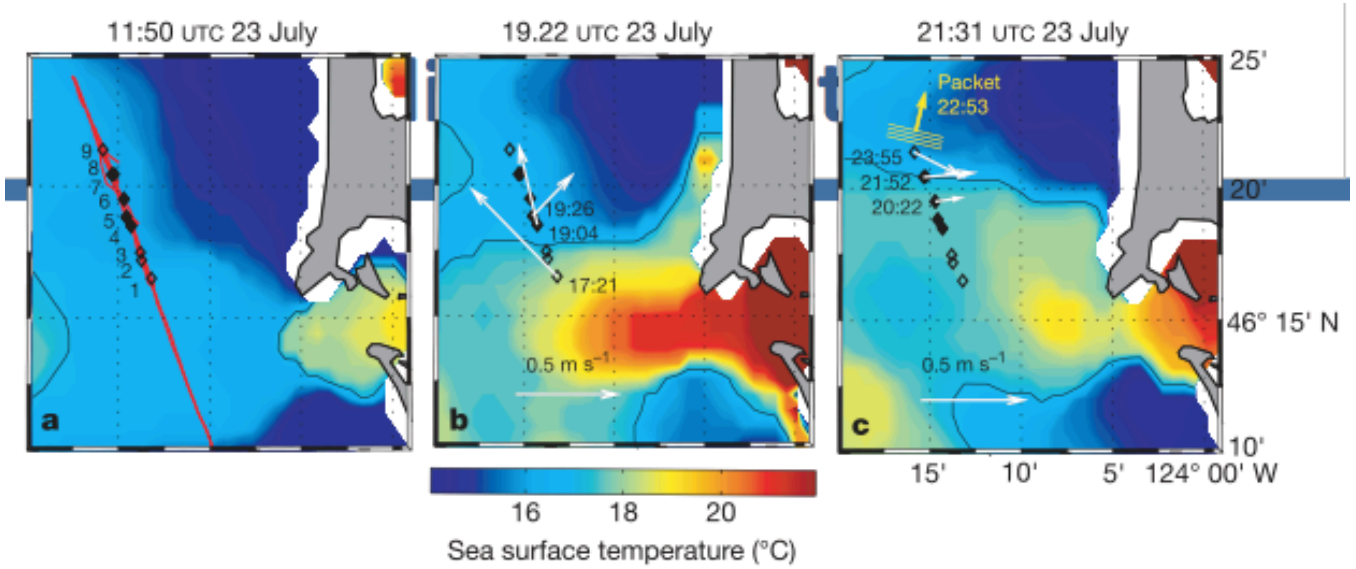

Figure 2 | Progression of the Columbia River plume from satellite-derived SST images. Times (23 July 2004 UTC) are 11:50 (**a**), 19:22 (**b**) and 21:31 (**c**). Red line in left panel is ship track. Diamonds show locations where plume front was crossed; filled diamonds correspond to the four crossings presented in Fig. 3. Near-surface fluid velocities behind the plume front u_p at selected crossings are indicated in **b** and **c** (45-s average over $0\,\mathrm{m} < z < 5\,\mathrm{m}$); vectors are grouped to correspond to time of SST images. The 17 °C isotherm is contoured and represents the approximate front location. Location of the wave packet at 22:53 as imaged by shipboard X-band radar is shown in **c**.

Primary Evidence: photograph

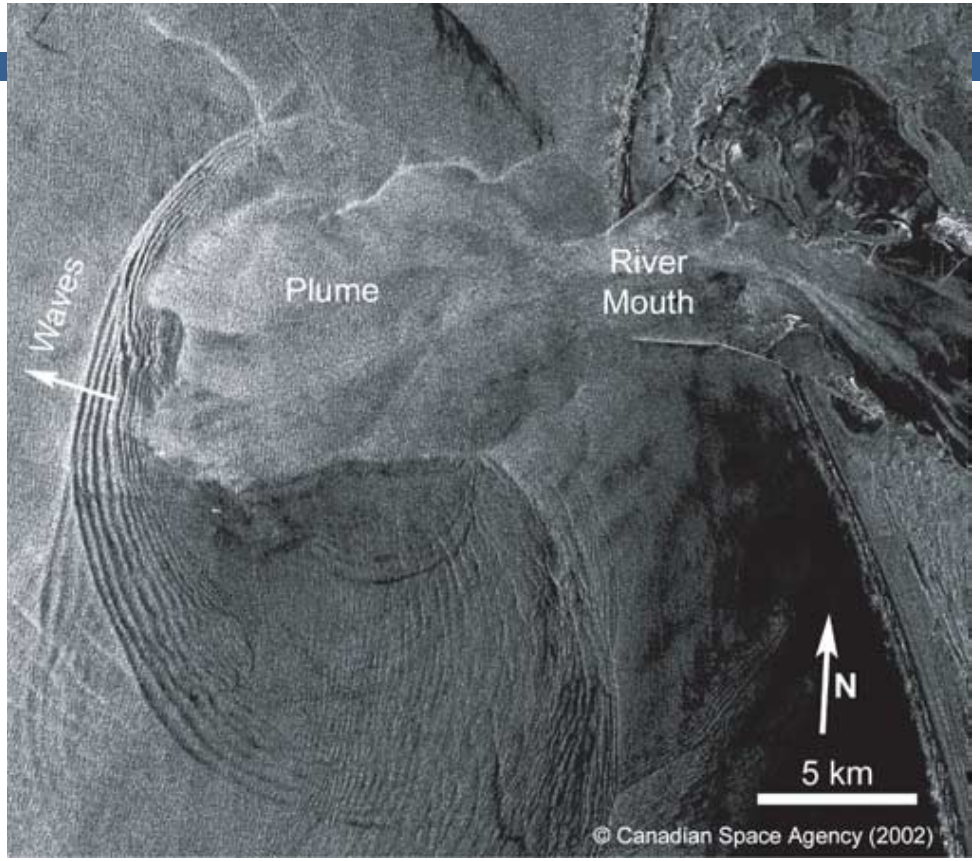

Figure 1 | Synthetic aperture radar (SAR) image of the Columbia River plume on 9 August 2002. Image indicates regions of enhanced surface roughness associated with plume-front and internal wave velocity convergences. Similar features appear in images during all summertime months (April–October; see http://oceanweb.ocean.washington.edu/rise/data.htm for more Columbia River plume images) and from other regions[1,2]. SAR image courtesy of P. Orton, T. Sanders and D. Jay; image was processed at the Alaska Satellite Facility, and is copyright Canadian Space Agency.

Primary Evidence: photograph

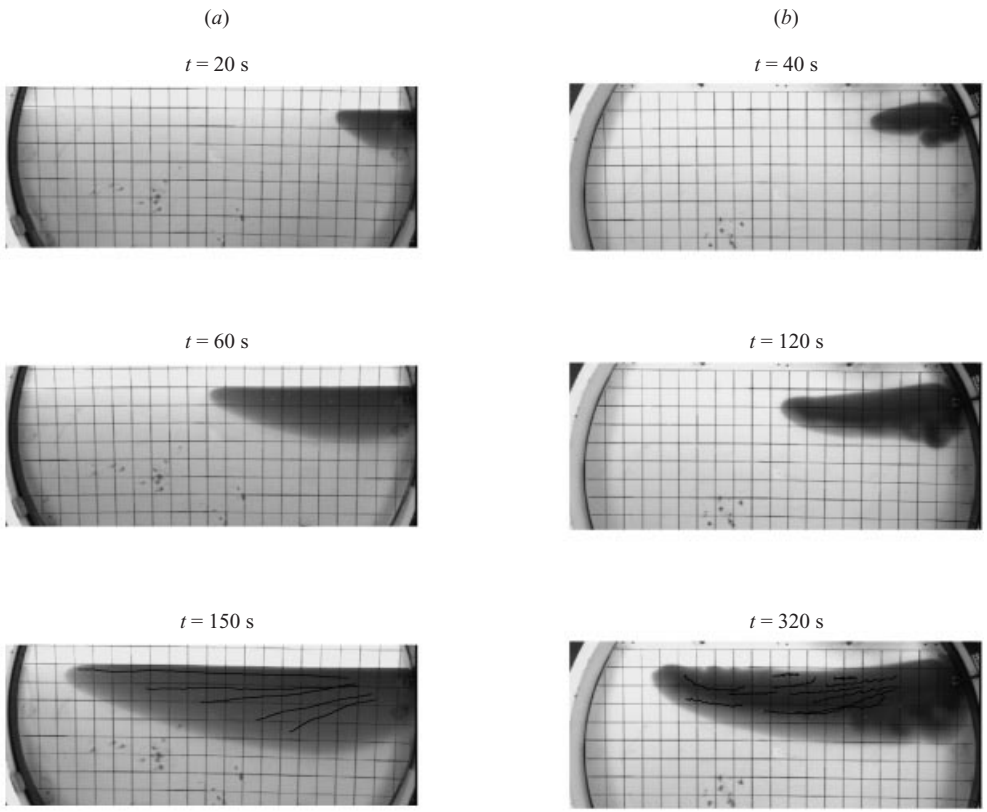

FIGURE 5. Examples of two laboratory runs, (*a*) run 16 $c_w/c_\alpha = 0.17$ and (*b*) run 4 $c_w/c_\alpha = 13$, at three times after the source was turned on. The lower panels include some of the surface particle tracks. The background grid has 10 cm spacing.

Lentz and Helfrich 2002 JFM

Primary Evidence: Data

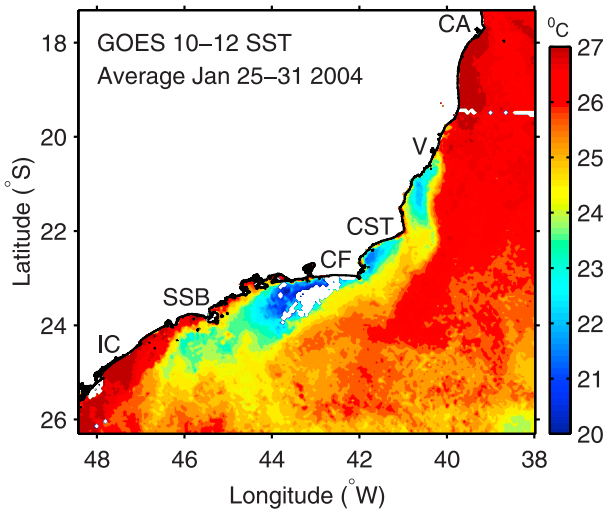

Figure 1. SST from the GOES 10–12 satellite averaged over 7 days (25–31) during January (austral summer), 2004, showing coastal upwelling near Cabo Frio. Clouds are marked in white. IC, Ilha Comprida; SSB, São Sebastião Island; CF, Cabo Frio; CST, Cabo de São Tomé; V, Vitória; CA, Caravelas.

Castelao 2008 JGR

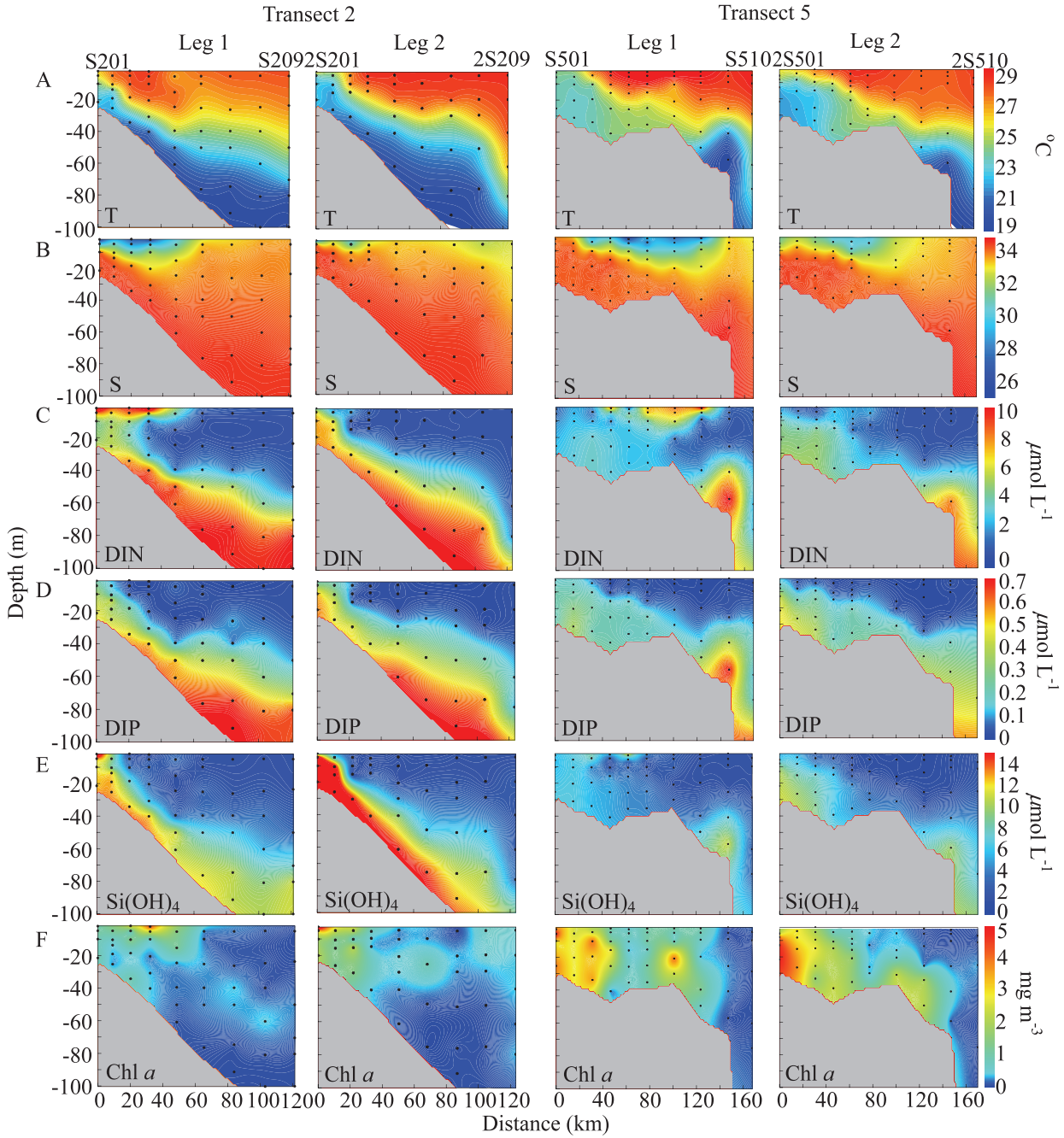

Fig. 3. Transectional distribution of T (°C), S, DIN (μmol L^{-1}), DIP (μmol L^{-1}), $Si(OH)_4$ (μmol L^{-1}), and Chl *a* (mg m^{-3}) in Transects 2 and 5 on the northern South China Sea shelf in summer 2008. The distributions of T and S in Transect 5 were redrawn from Shu et al. (2011*a*).

Han et al., 2012 LO

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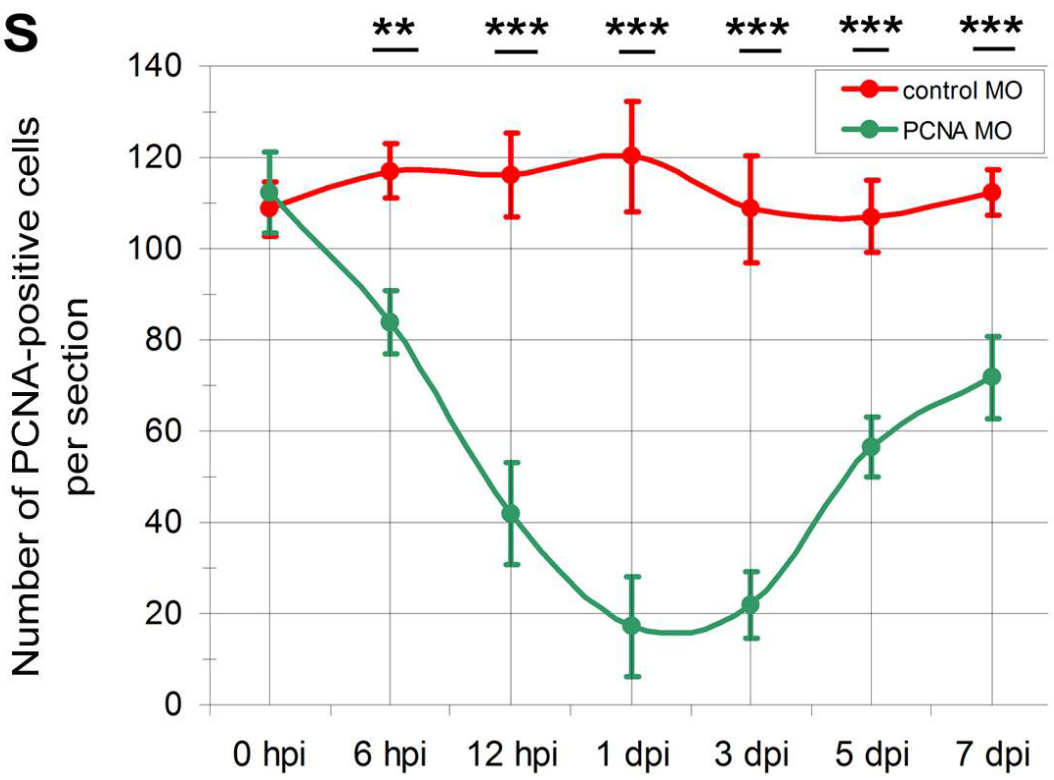
Graphs

- line graphs
- scatter plots
- bar graphs
- histograms
- box plots
- vector arrows

Line graphs

*Used to show trends over time, age, or dose (can display group means or individuals)

Line Graphs



Kizil C, Brand M (2011) Cerebroventricular Microinjection (CVMI) into Adult Zebrafish Brain Is an Efficient Misexpression Method for Forebrain Ventricular Cells. PLoS ONE 6(11): e27395. doi:10.1371/journal.pone.0027395
http://www.plosone.org/article/info:doi/10.1371/journal.pone.0027395

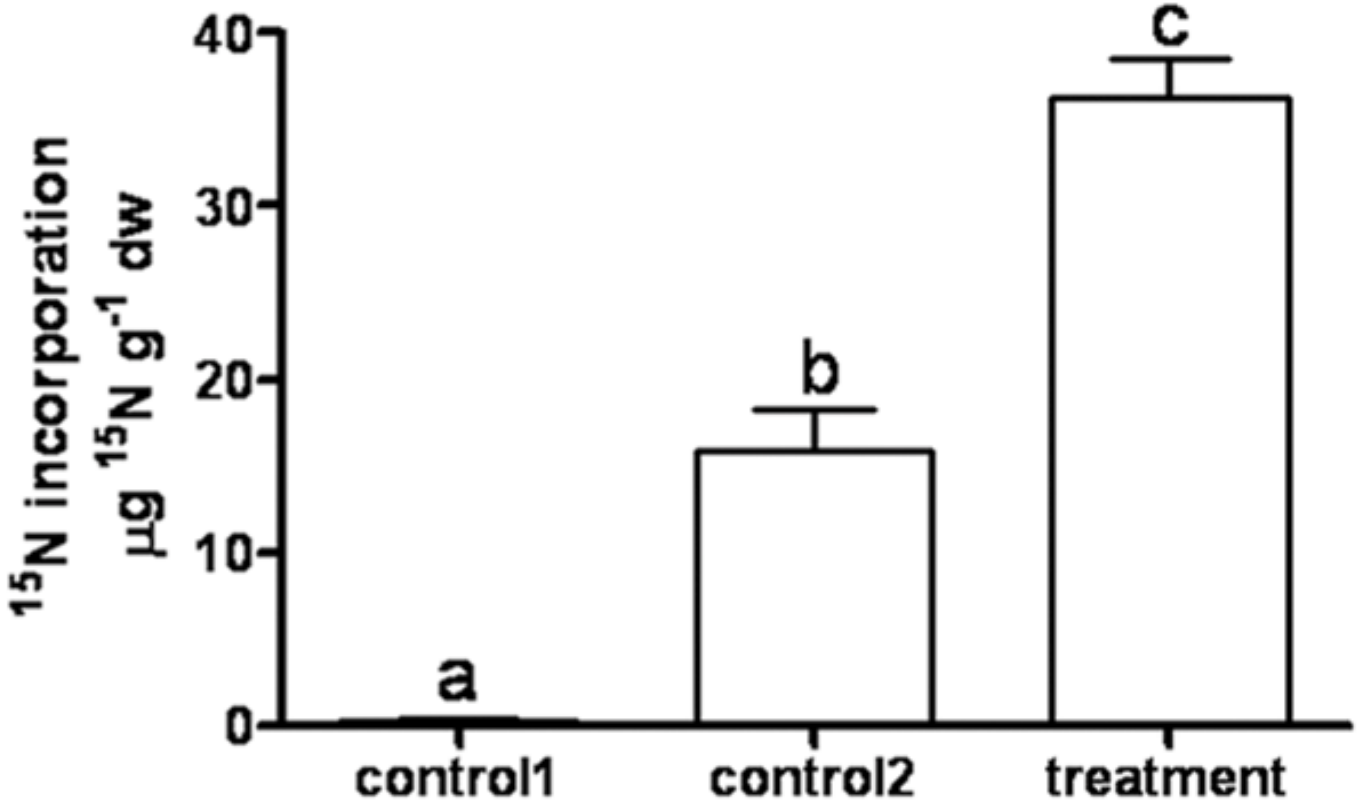
Bar Graphs

*Used to compare groups at one time point

*Tells a quick visual story

Bar graph

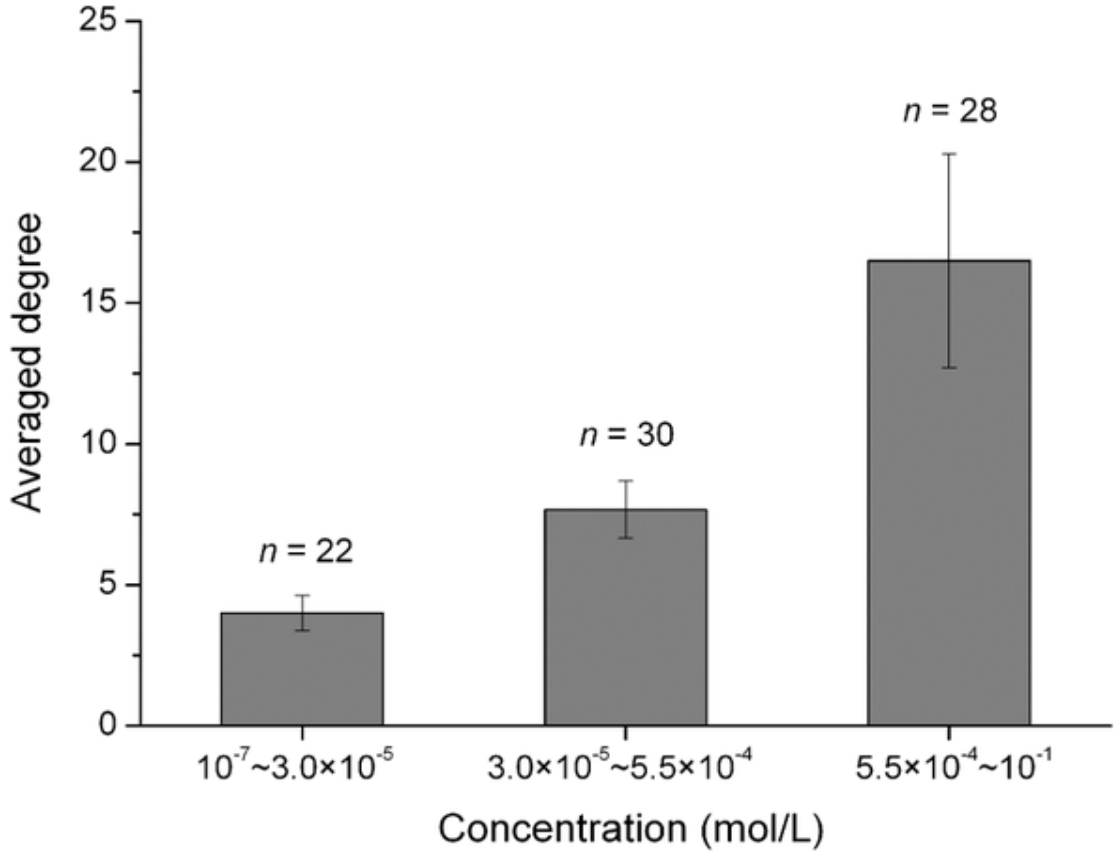
- **Figure 6. Incorporation of E. coli-derived 15N by leaves of tomato plants.**



Paungfoo-Lonhienne C, Rentsch D, Robatzek S, Webb RI, et al. (2010) Turning the Table: Plants Consume Microbes as a Source of Nutrients. PLoS ONE 5(7): e11915. doi:10.1371/journal.pone.0011915

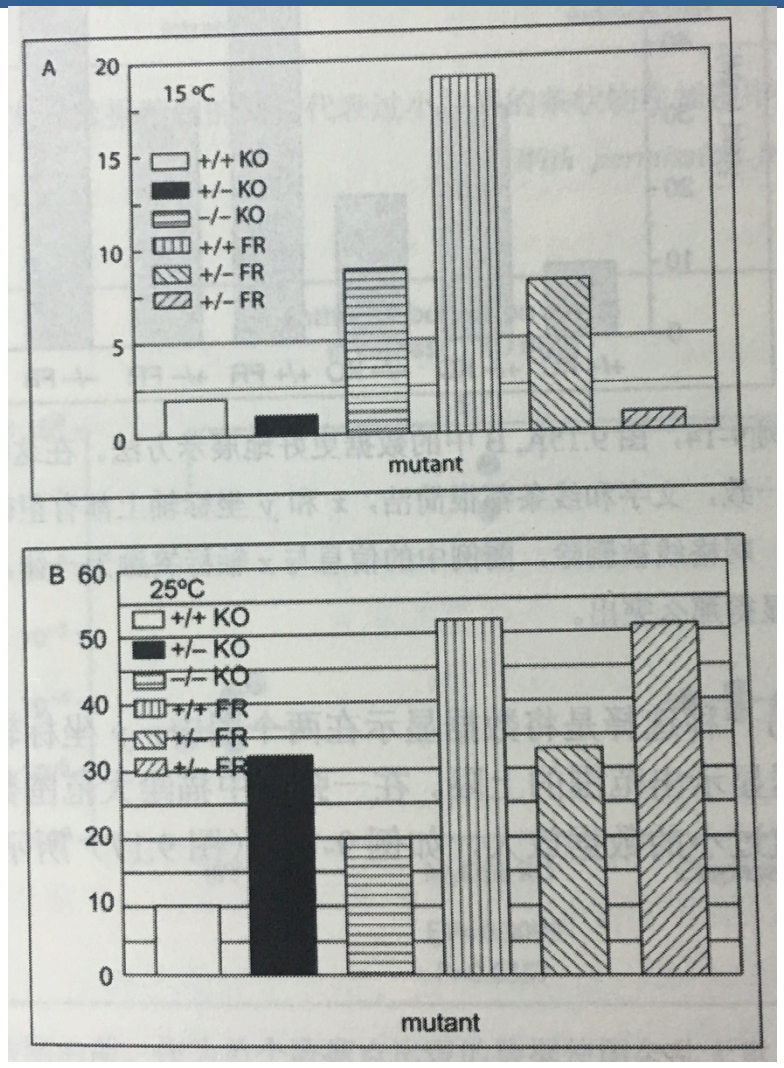
Bar graph

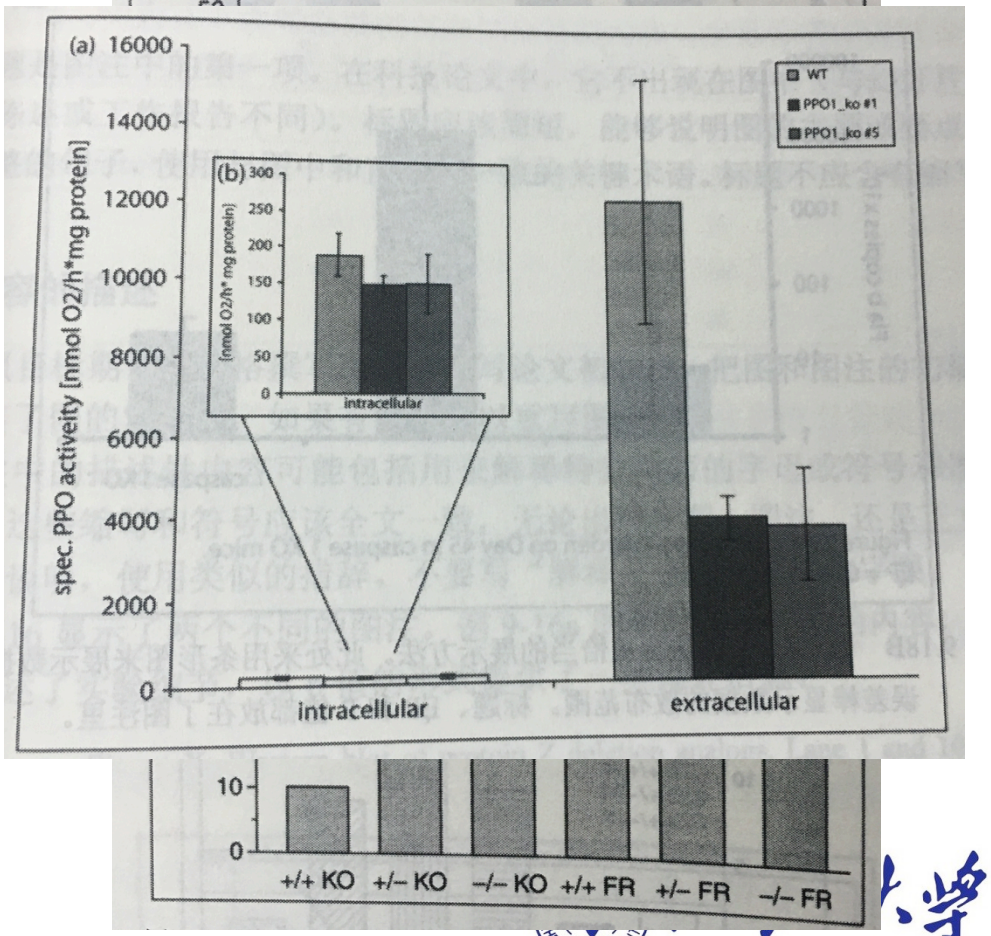
Figure 3. Degree-concentration correlation for E. coli metabolites (P<.01, Kruskal-Wallis test).



Zhu Q, Qin T, Jiang Y-Y, Ji C, et al. (2011) Chemical Basis of Metabolic Network Organization. PLoS Comput Biol 7(10): e1002214. doi:10.1371/journal.pcbi.1002214
http://www.ploscompbiol.org/article/info:doi/10.1371/journal.pcbi.1002214

Bar graph





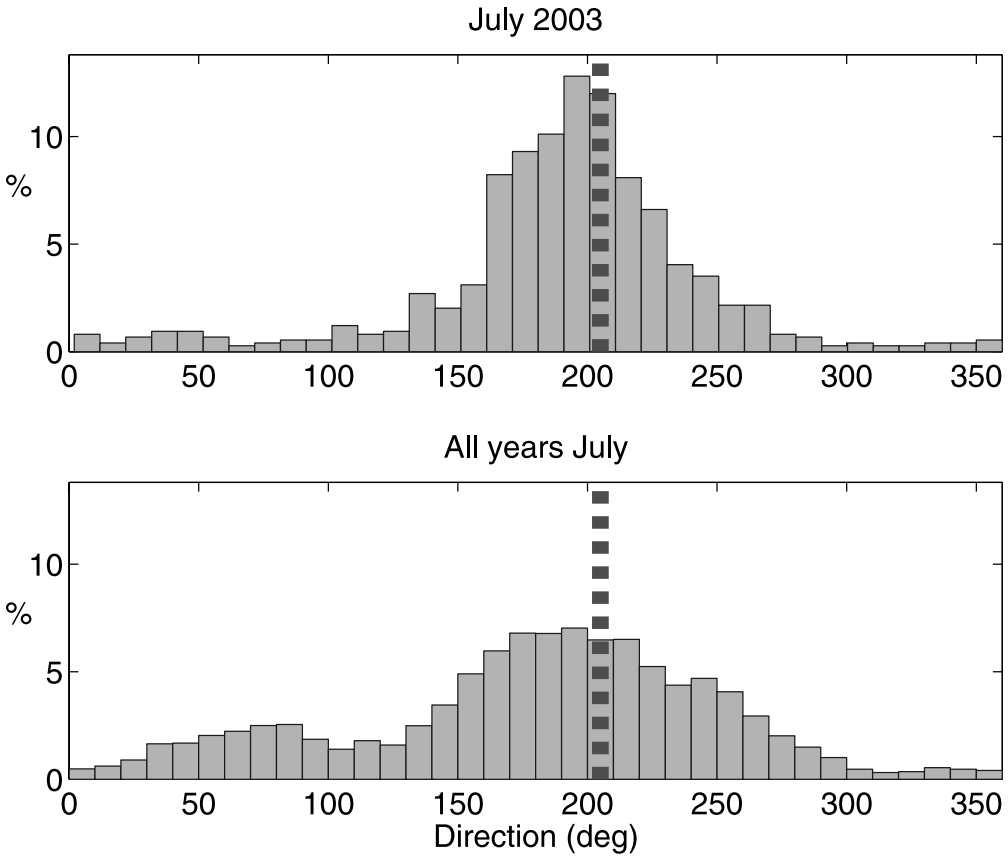


Figure 5. Histograms of wind direction for 2003 and the previous years (1988–1992, 1997–2002) for the month of July at buoy 41008 (Gray's Reef). The thick dashed line represents the upwelling-favorable direction.

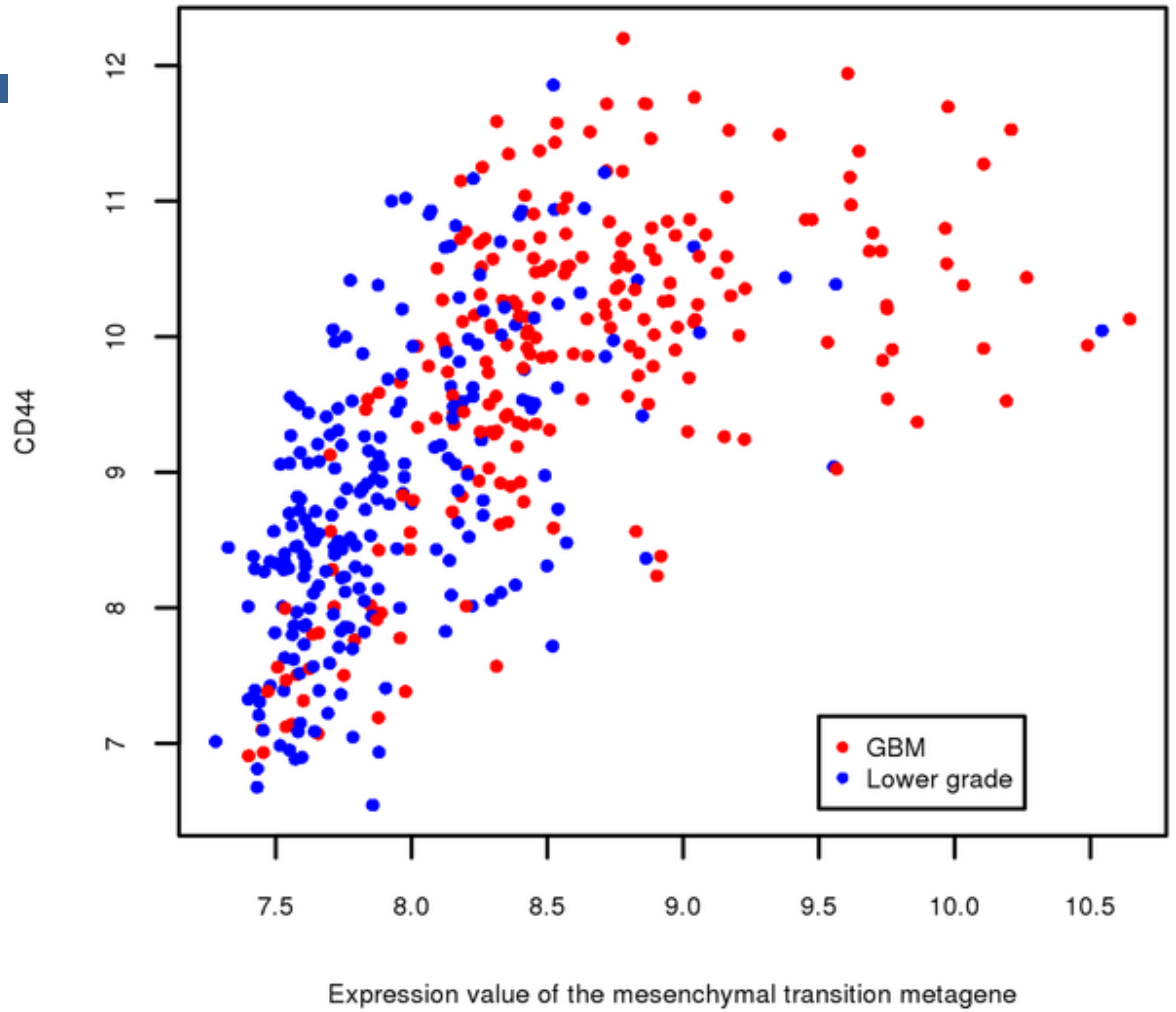
Aretxabaleta et al., 2006 JGR

Scatter plots

*Used to show relationships between two variables (particularly linear correlation)

*Allows reader to see individual data points=more information!

Figure 4. Scatter plot for the expression levels of CD44 vs. the mesenchymal transition metagene.



Cheng W-Y, Kandel JJ, Yamashiro DJ, Canoll P, et al. (2012) A Multi-Cancer Mesenchymal Transition Gene Expression Signature Is Associated with Prolonged Time to Recurrence in Glioblastoma. PLoS ONE 7(4): e34705. doi:10.1371/journal.pone.0034705
http://www.plosone.org/article/info:doi/10.1371/journal.pone.0034705

Linear regression

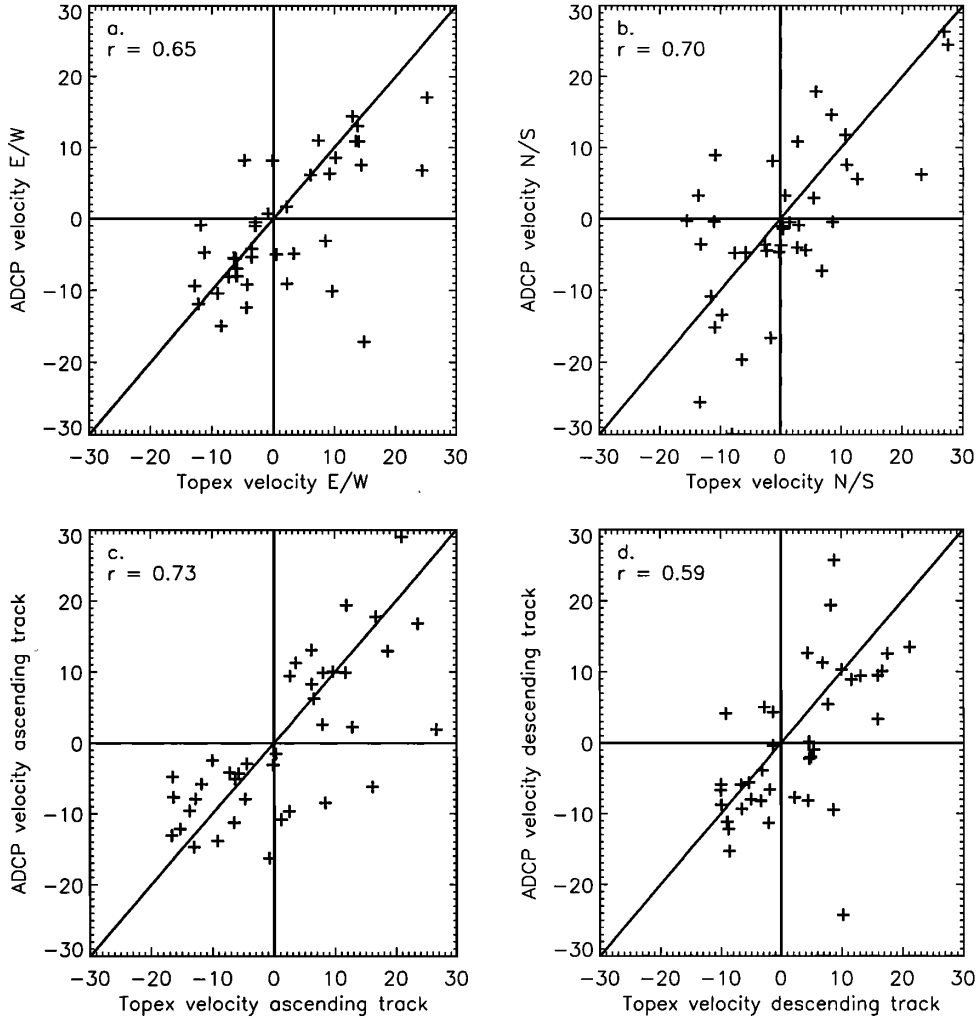


Figure 3. Scatterplots of ADCP versus TOPEX velocity components for the 13 months of data: (a) u, (b) v, (c) V_{ca}, (d) V_{cd}. Units are in centimeters per second. Correlations are shown in the upper left for the data in each panel.

Strub et al. 1997 JGR

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Comparison between theories and observations

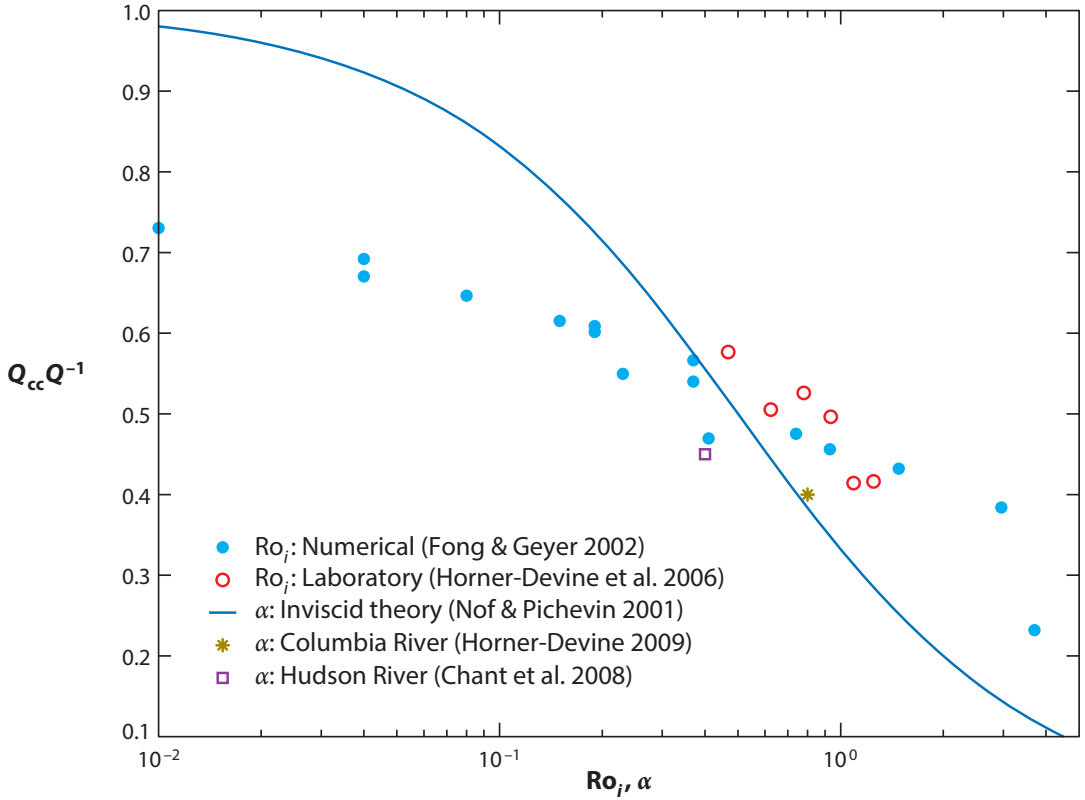

Figure 3

Comparison of theoretical predictions for the coastal current transport from **Equation 9** (Nof & Pichevin 2001) with numerical (Fong & Geyer 2002), experimental (Horner-Devine et al. 2006), and field observational (Chant et al. 2008, Horner-Devine 2009) estimates. Note that the abscissa is Ro for the laboratory and model data and α for the theory and field data. These correspond to estimates of the normalized vorticity at the inflow and in the bulge, respectively.

Horner-Devine et al., 2015 ARFM

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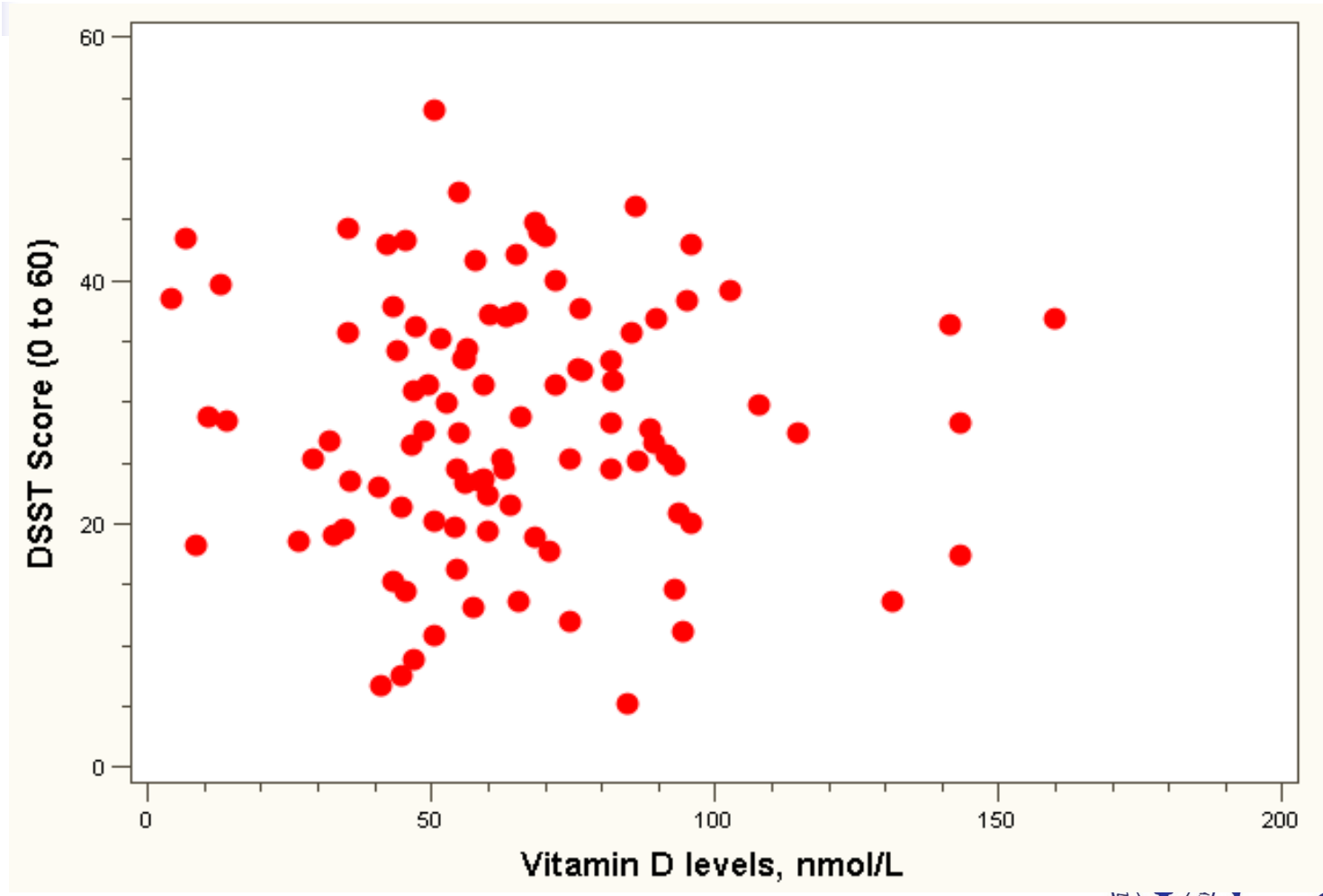
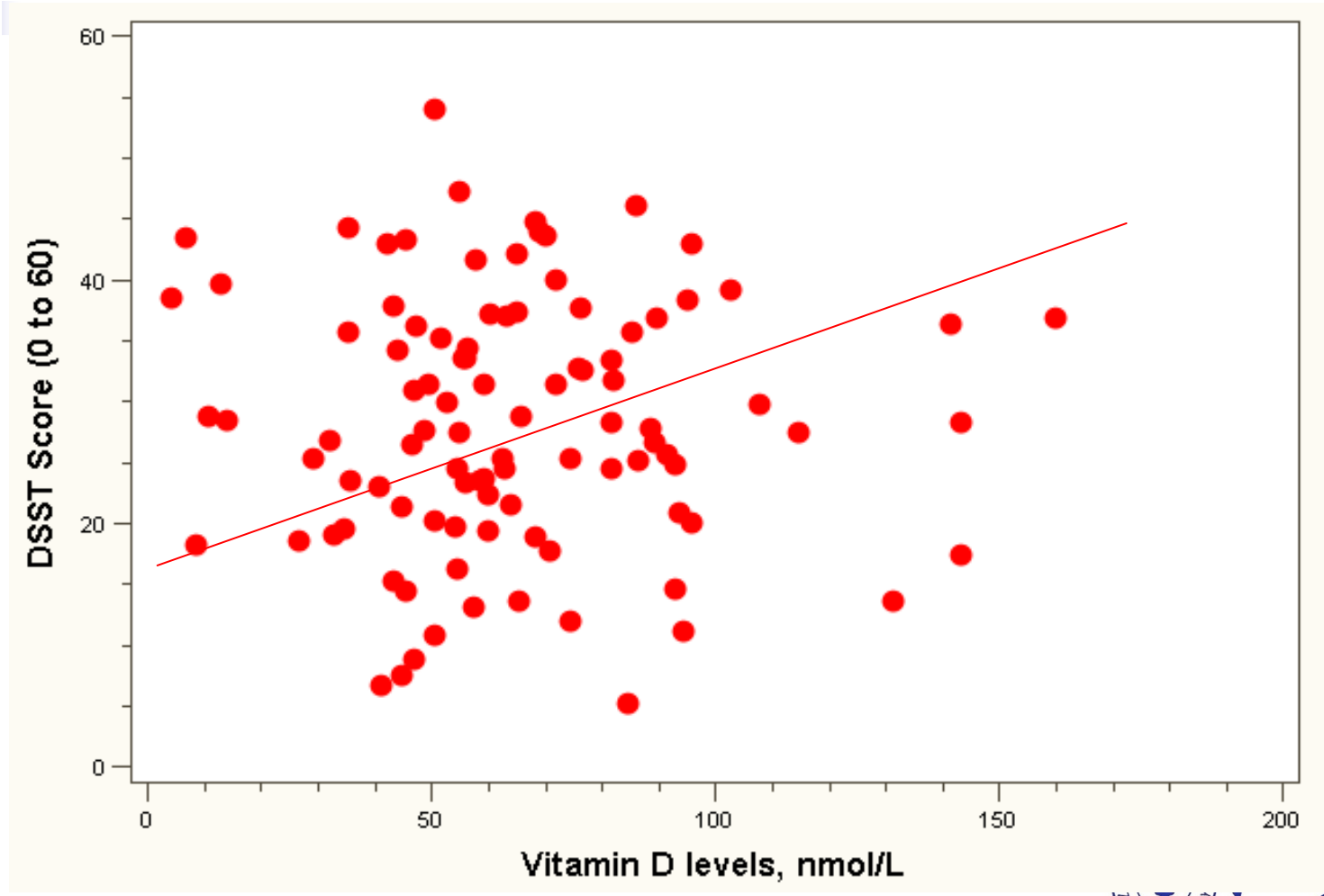
Lines can draw your eyes!



Lines can draw your eyes!



Tips for graphs

- Tell a quick visual story
- Keep it simple!
- Make it easy to distinguish groups (e.g., triangles vs. circles vs. squares is not easy!)
- If it's too complex, maybe it belongs in a table

Drawing and Diagrams

- Illustrate and experimental setup or work flow
- Illustrate cause and effect relationship or cycles
- Give a hypothetical model
- Cartoons

Difference between Primary Evidence and Drawings

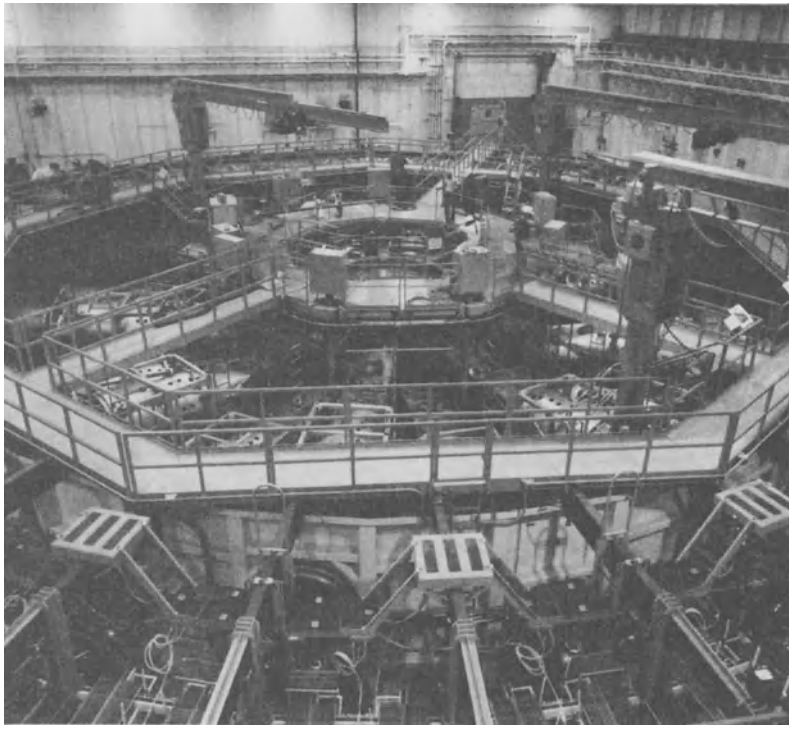


Figure 10-6. Nuclear fusion experiment at Sandia National Laboratories. Here, an accelerator focuses lithium ions onto deuterium-tritium pellets to produce nuclear fusion [VanDevender, 1985].

Makes it clear to the reader that the facility does, in fact, exist.

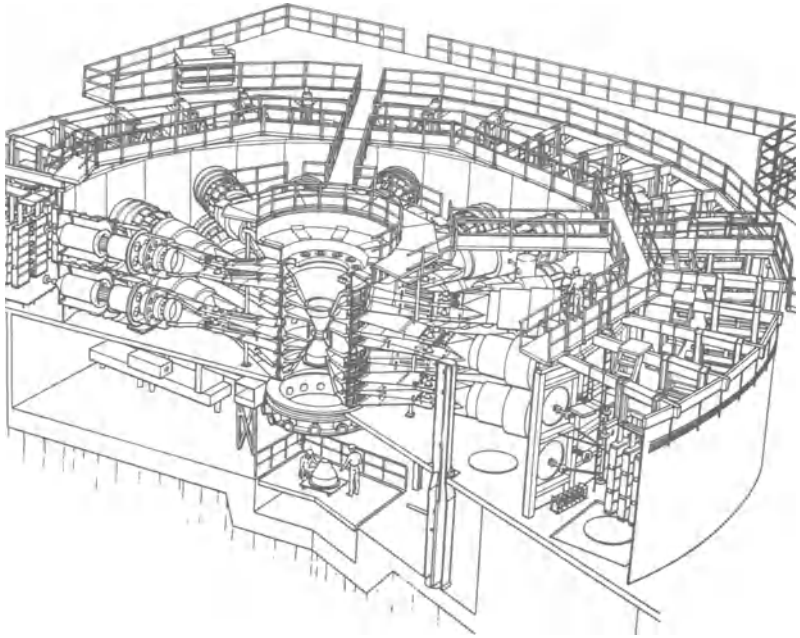


Figure 10-7. Cutaway view of a nuclear fusion experiment at Sandia National Laboratories [VanDevender, 1985].

You can control the amount of precision:

- Delete cranes and wiring
- Present an unusual perspective (a cutaway) that captures the inner detail of this experiment

Study area (map)

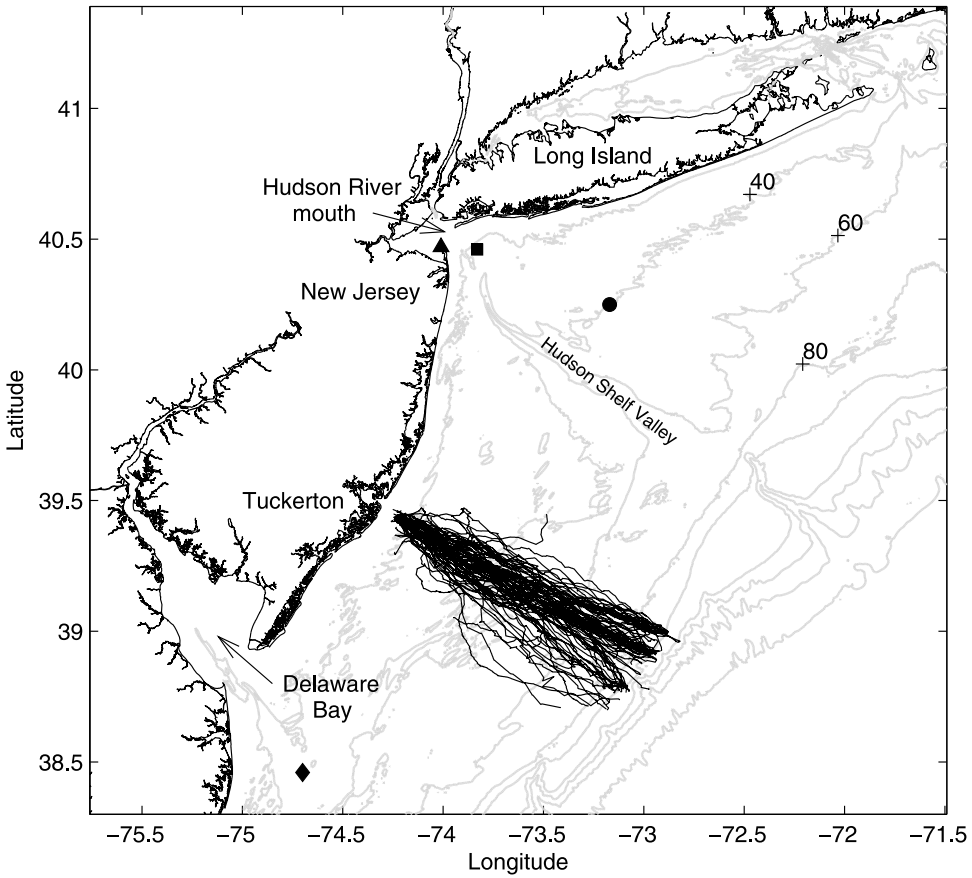


Figure 1. Study area showing glider tracks (black lines). Also shown are location of NOAA NDBC buoys 44025 (circle), 44009 (diamond), NOS station SDHN4 (triangle) and CMAN station at Ambrose Light (square).

Castelao et al., 2007 JGR

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Experimental setup

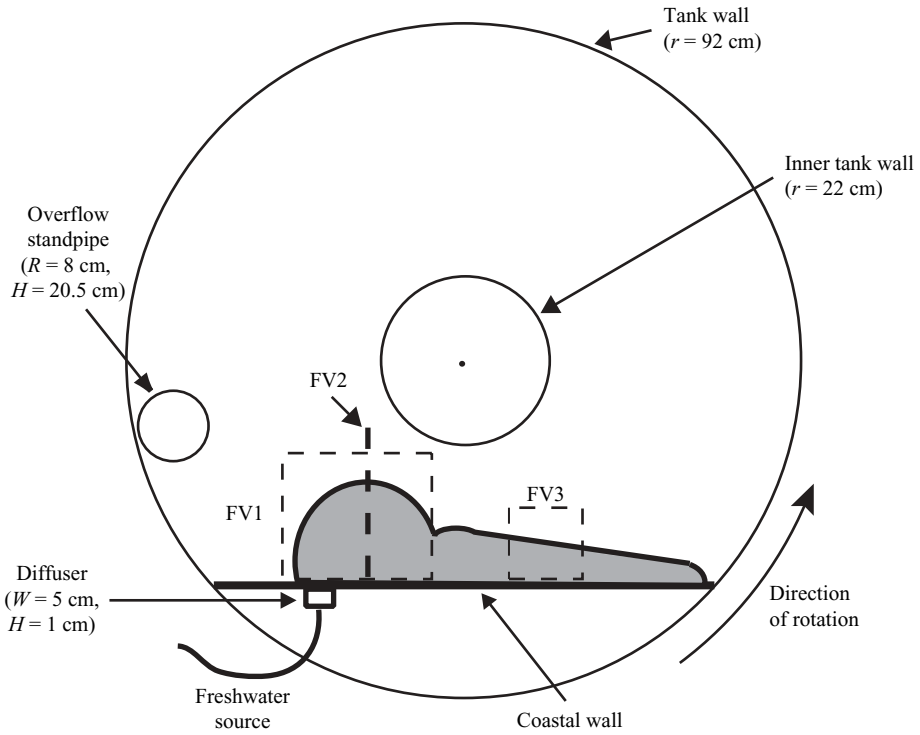

FIGURE 1. Schematic of the rotating table from above showing the camera field of view for the three measurement sections. FV1 is the camera field of view for the horizontal section through the bulge. For these experiments the camera is directly above the field of view looking down. FV2 is the plane of the laser sheet in the vertical bulge section. The plane is perpendicular to the figure, and it is viewed from the left-hand side by the camera. FV3 is the field of view in the angled coastal current section. In these experiments, the sheet is 15° to the horizontal, so that it intersects the surface on the right-hand side of the field of view and is submerged on the left-hand side. The camera is also inclined so that the entire field of view is in focus.

Horner-Devine et al., 2006 JFM

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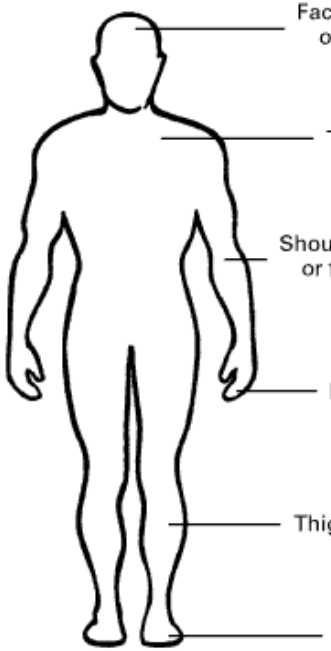
Results



Location of Wound	Dog Bite	Cat Bite
	% of patients	
Face, scalp, or neck	16	2
Trunk	2	0
Shoulder, arm, or forearm	12	23
Hand	50	63
Thigh or leg	16	9
Feet	4	3

Figure 1. Location of Wound Infections in 50 Patients Bitten by Dogs and 57 Patients Bitten by Cats.

Schematic diagram in discussion

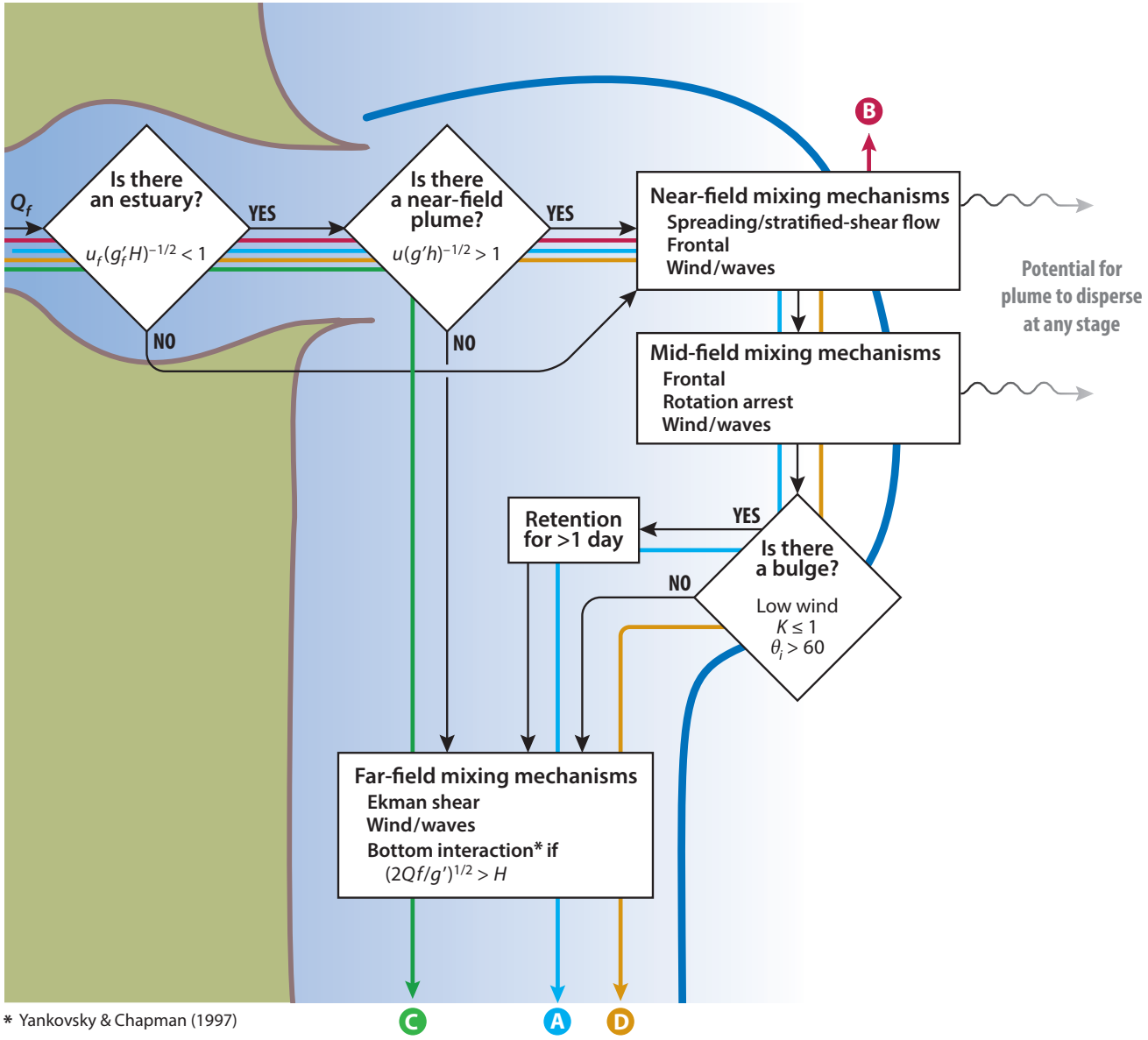


Figure 4

A schematic representation of mixing pathways in river plumes based on the presence or absence of different plume regions. Pathways A–D correspond to plumes A–D in **Figure 5**.

Horner-Devine et al., 2015 ARFM

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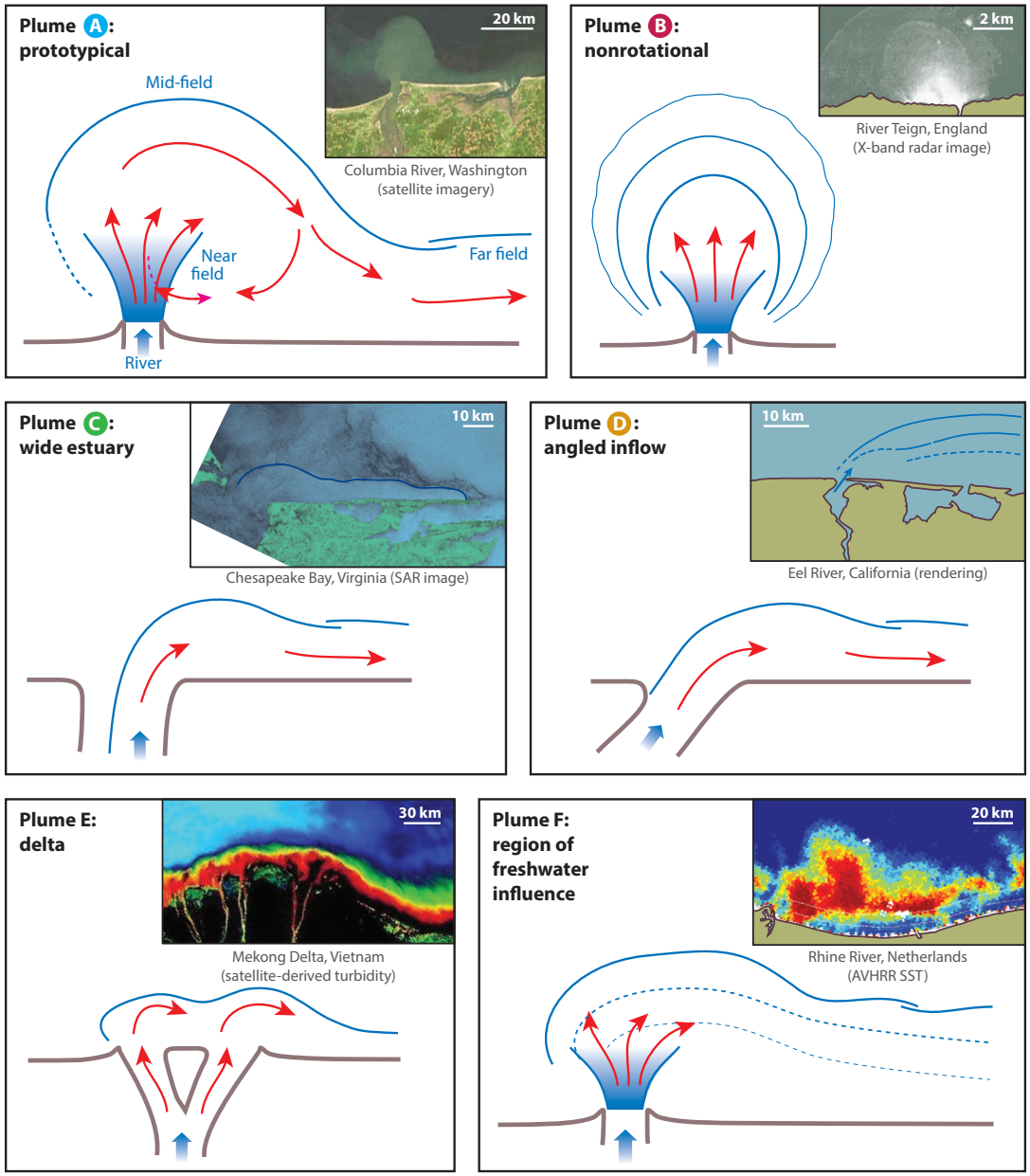

Figure 5

River plume morphologies: prototypical (plume A), nonrotational (plume B), wide estuary (plume C), angled inflow (plume D), delta plume (plume E), and region of freshwater influence (plume F). Inset images show examples of each plume type: (plume A) the Columbia River (SeaWiFS), (plume B) River Teign (Pritchard & Huntley 2006), (plume C) Chesapeake Bay (Donato & Marmorino 2002), (plume D) Eel River (Geyer et al. 2000), (plume E) Mekong River (Wisdom Project), and (plume F) Rhine River (De Boer et al. 2009).

Horner-Devine et al., 2015 ARFM

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Besides table and figures…Movies!
(Allow as supplemental material or enhanced online)

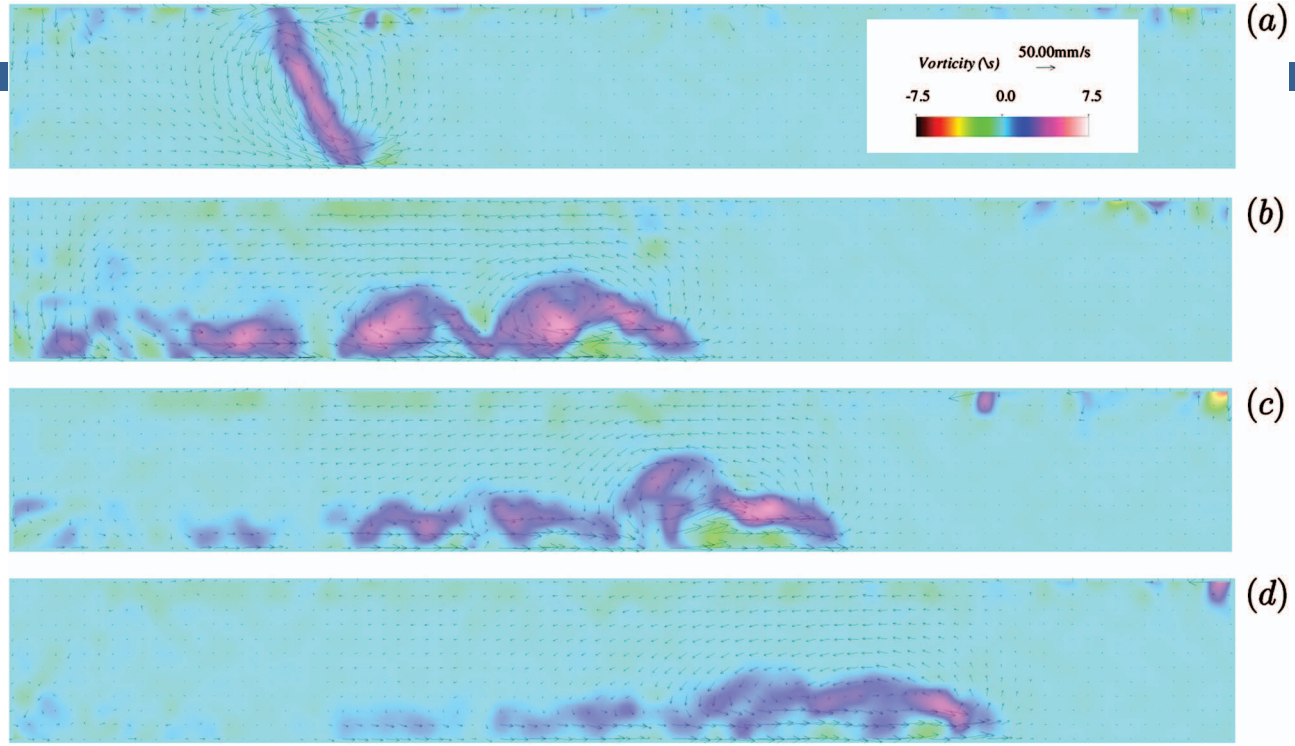

FIG. 8. (Color) (a)–(d) PIV and vorticity results derived from experiment 6 at times t/T=0.055, 0.38, 0.53, and 0.71 (enhanced online).

Patterson et al., 2006 POF

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Results ≠ Raw data

- The results section should:
  - Summarize what the data show
    - Point out simple relationships
    - Describe big-picture trends
    - Cite figures or tables that present supporting data
  - Avoid simply repeating the numbers that are already available in tables and figures.

Hypothetical examples

The characteristics of the bad witches and the good witches are shown in Table 1. There was a significant difference in age between the groups. The mean age of the bad witches was 45 ± 5; and the mean age of the good witches was 36 ± 6. There was no significant difference in gender between the groups, with the bad witches having 85% females and the good witches having 83% females. BMI was not significantly different between the groups, which both had normal BMIs. Systolic blood pressure and exercise were significantly different. The bad witches had a mean blood pressure of 140 ± 10, whereas the good witches had a mean blood pressure of 120 ± 9. Estimated daily exercise was higher in the good witches (60 ± 30) than the bad witches (30 ± 20). Employment was not significantly different between the two groups...

Table 1. Descriptive characteristics of the study groups, means ± SD or N (%).

Characteristic	Bad Witches	Good Witches
N	13	12
Age (yrs)	45 ± 5	36 ± 6*
Female	11 (85%)	10 (83%)
BMI (kg/m^2)	21 ± 6	23 ± 3
Systolic BP (mmHg)	140 ± 10	120 ± 9*
Exercise (min/day)	30 ± 20	60 ± 30*
Employment status		
Unemployed	4 (31%)	0 (0%)
Part time	3 (23%)	4 (33%)
Full time	6 (46%)	8 (66%)
Smoker (yes/no)	6 (50%)	0 (0%)*

*p<.05, ttest or Fisher's exact test, as appropriate.

Original:

The characteristics of the bad witches and the good witches are shown in Table 1. There was a significant difference in age between the groups. The mean age of the bad witches was 45 ± 5; and the mean age of the good witches was 36 ± 6. There was no significant difference in gender between the groups, with the bad witches having 85% females and the good witches having 83% females. BMI was not significantly different between the groups, which both had normal BMIs. Systolic blood pressure and exercise were significantly different. The bad witches had a mean blood pressure of 140 ± 10, whereas the good witches had a mean blood pressure of 120 ± 9. Estimated daily exercise was higher in the good witches (60 ± 30) than the bad witches (30 ± 20). Employment was not significantly different between the two groups...

Revised:

The witches were, on average, lean and predominantly female (Table 1). Bad witches were significantly older, had higher blood pressures, exercised less, and were more likely to smoke than good witches. More bad witches were unemployed, but this difference did not reach statistical significance.

Tips in writing results

- Break into subsections, with headings (if needed)
- Complement the information that is already in tables and figures
  - Give precise values that are not available in the figure
  - Report the percent change or percent difference if absolute values are given in the table
- Repeat/highlight only the most important numbers

Tips in writing results

- Don’t forget to talk about negative and control results
- Reserve the term “significant” for statistically significant
- Reserve information about what you did for the methods section
  - In particular, do not discuss the rationale for statistical analyses within the Results section.
- Reserve comments on the meaning of your results for the discussion section

What verb tense do I use?

- Use past tense for completed actions:
  - We found that...
  - Women were more likely to...
  - Men smoked more cigarettes than...
  - The average reaction time was...
- Use the present tense for assertions that continue to be true, such as what the tables show, what you believe, and what the data suggest:
  - Figure 1 shows...
  - The findings confirm...
  - The data suggest...
  - We believe that this shows...

Example: verb tense

Information was available for 7766 current cigarette smokers. Of these, 1216 (16%) were classified as hardcore smokers. Table 1 gives characteristics of all the smokers. The most striking difference was that hardcore smokers were about 10 years older on average and tended to be more dependent on tobacco. Significantly more hardcore smokers had manual occupations, lived in rented accommodation, and had completed their full time education by the age of 16 years. There was no difference by sex.

Jarvis et al. Prevalence of hardcore smoking in England, and associated attitudes and beliefs: cross sectional study *BMJ* 2003;326:1061 (17 May)

Use the active voice!

- More lively!
- Since you can talk about the subjects of your experiments, “we” can be used sparingly while maintaining the active voice!

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

Who, what, when, where, how, and why…

Table 1.

Who, what, when, where, how, and why questions to consider when writing the Methods section.

Who
Who maintained the records? Who reviewed the data? Who collected the specimens? Who enrolled the study participants? Who supplied the reagents? Who made the primary diagnosis? Who did the statistical analyses? Who reviewed the protocol for ethics approval? Who provided the funding?
What
What reagents, methods, and instruments were used? What type of study was it? What were the inclusion and exclusion criteria for enrolling study participants? What protocol was followed? What treatments were given? What endpoints were measured? What data transformation was performed? What statistical software package was used? What was the cutoff for statistical significance? What control studies were performed? What validation experiments were performed?
When
When were specimens collected? When were the analyses performed? When was the study initiated? When was the study terminated? When were the diagnoses made?
Where
Where were the records kept? Where were the specimens analyzed? Where were the study participants enrolled? Where was the study performed?
How
How were samples collected, processed, and stored? How many replicates were performed? How was the data reported? How were the study participants selected? How were patients recruited? How was the sample size determined? How were study participants assigned to groups? How was response measured? How were endpoints measured? How were control and disease groups defined?
Why
Why was a species chosen (mice vs rats)? Why was a selected analytical method chosen? Why was a selected experiment performed? Why were experiments done in a certain order?

from: Annesley TM. Who, what, when, where, how, and why: The ingredients in the recipe for a successful methods section. *Clinical Chemistry*. June 2010 vol. 56 no. 6, 897-901.

Methods

- Materials
  - Drugs, buffers, chemicals, gases, etc…
- Data
  - Where do you obtain your data (e.g., government, institution, online source, etc…)
- Participants/subjects
  - Animals / Humans (state that the research was approved by the appropriate committee at your institution)
- Experimental protocol/study design
- Measurements
  - How were the dependent and independent variables measured Instruments (telescope, microscope, weighing scale, questionnaire, etc.)
  - Where do you make measurements?

Make life easy for your reader!

1. Break into sub-sections with informative subheadings

METHODS
Data description
QuickSCAT measurements of Wind stress
AMSR-E measurements of sea surface temperature

METHODS
Field program
Site Description and Data Collection
Field Method

METHODS
Model description
Experimental setup
2-D online smoothing
Experiment details
Data sets

METHODS
Model background
Equations and discretizations
Configuration and forcing

METHODS
Experimental facility
Concentration measurements
Particle imaging velocimetry

Make life easy for your reader!

2. Cite a reference for commonly used methods or previously used methods rather than explaining all the details...

Cite commonly/previously used methods

To examine the more highly developed region of the arrested wedge flow, experiments were conducted in a modified version of the facility described in detail in Pawlak & Armi (1998).

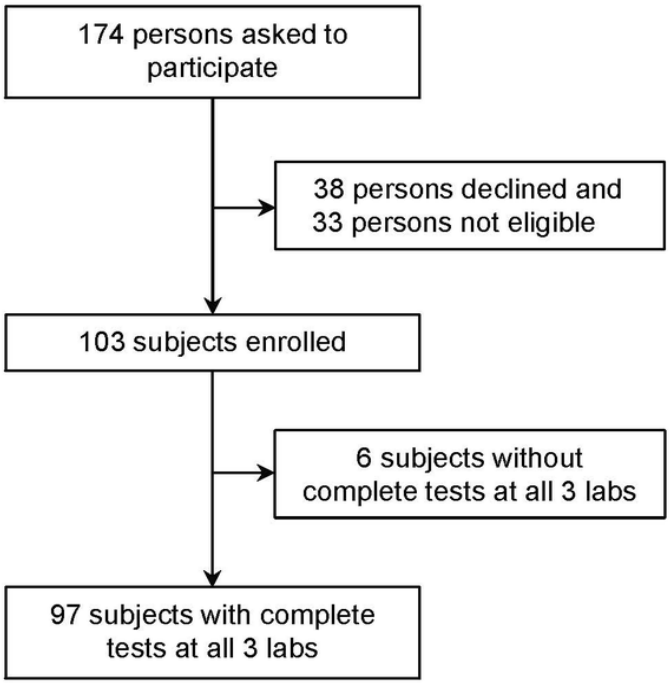
The details of the initial condition can be found in Cantero et al. (2006). The use of a rectangular grid to solve a cylindrical problem may seem odd. However, a rectangular grid provides a uniform resolution away from the centre of the domain, thus capturing better the fine structures of the flow at the front (lobes and clefts). The governing equations are solved using a de-aliased pseudospectral code whose details can be found in Cantero et al. (2007).

In a first stage, mesoscale eddies were detected on each SLA map using the algorithm initially developed by Chaigneau et al. [2008] and slightly modified by Chaigneau et al. [2009]. This algorithm detects eddy centers corresponding to local SLA extrema (minima for CEs and maxima for AEs).

Make life easy for your reader!

3. Use flow diagrams or tables to help simplify explanations of methods!

Figure 1. Study participation diagram.



Whitworth WC, Hamilton LR, Goodwin DJ, Barrera C, et al. (2012) Within-Subject Interlaboratory Variability of QuantiFERON-TB Gold In-Tube Tests. PLoS ONE 7(9): e43790.

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Experimental setup

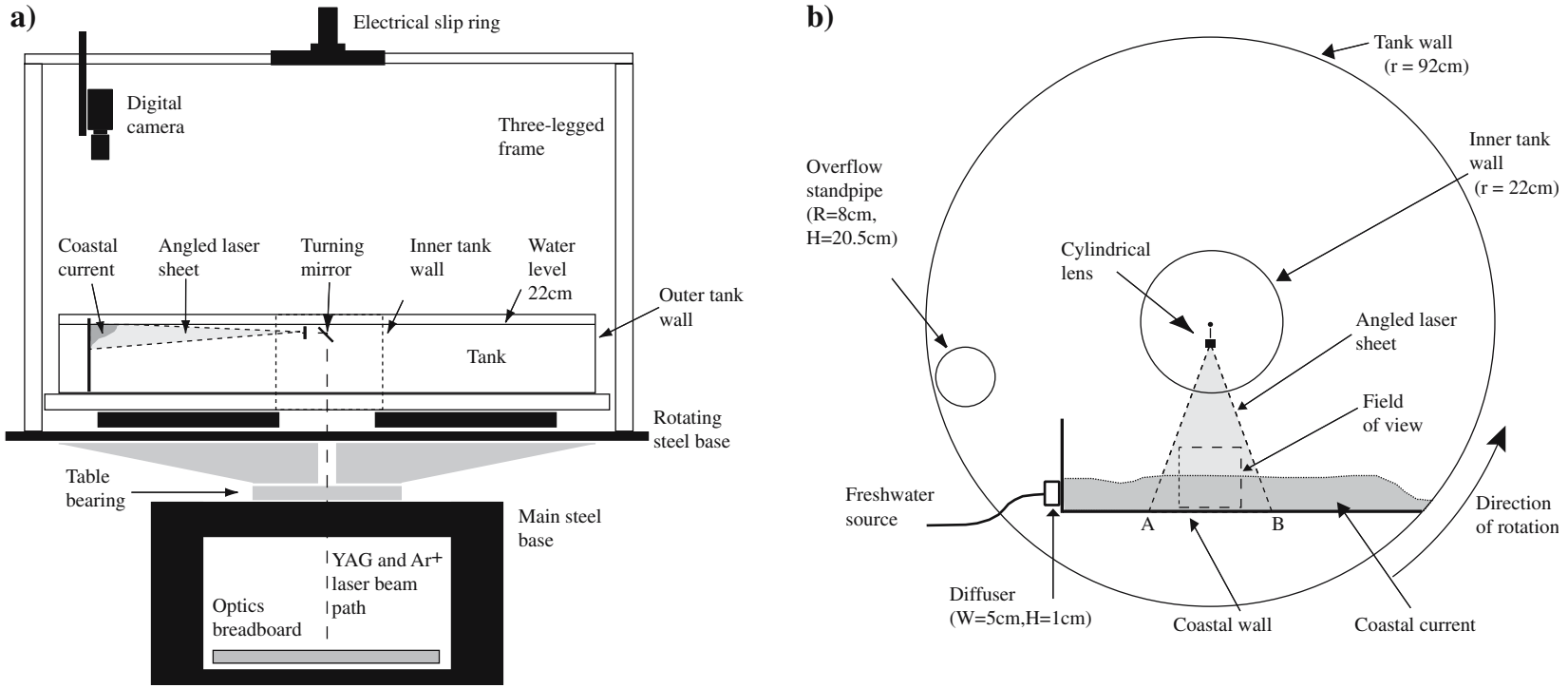

Fig. 1 Schematic of the rotating table viewed from the side **a**, and of the tank configuration viewed from above **b**. The orientation of the angled laser sheet is included in both schematics. In **b** the side of the sheet labeled B extends above the water surface and A extends below the buoyant current

Horner-Devine, 2006 EIF

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Verb tense

- Report methods in past tense
  - "we measured"

- But use present tense to describe how data are presented in the paper
  - "data are summarized as means ± SD"

It’s OK to use passive voice (or even to use a combination)!

- **Passive:**

  E.g., Oral temperatures were measured.
  Emphasizes the method or variable.

- **Active:**

  E.g., We measured oral temperatures

  More lively, but sacrifices having the material/method/variable as the subject of the sentence

  Requires creativity to avoid starting every sentence with We!

Homework 3

Find three figures in each category:

- (3) Primary evidence
- (3) Graph
- (3) Diagram and drawing

Write a short paragraph to describe your findings regarding to each figure

Due Dec 17th (Sunday)