



MP Module 2

Results, Discussion, & Introduction

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Roadmap

- Anatomy of the **Results** section
- Anatomy of the **Discussion**
- Anatomy of the **Introduction**



Results

- Present research results
 - Narrated for readers
 - Accompanied by statistics, tables, and/or figures
- Reporting rather than interpreting

Results: What to Include

- Preliminary discussion (importance of results)
- Information on the type of data analysis
- Presentation of results (narrative, statistics, tables, figures)

Results: What to Include

- Preliminary discussion (importance of results)
- Information
- Presentation of results (tables, figures, etc.)

Storytelling

Results: Preliminary Discussion

- Explain why results are meaningful
- Demonstrate that study conditions were met

Results: Type of Data Analysis

- Describe the analysis you conducted
 - Qualitative methods
 - Quantitative methods
 - Both qualitative and quantitative methods
- Provide justification for the analysis

Results: Presentation of Results

- Remind readers of hypotheses
- Remind readers of operations performed
- Provide results in narrative form
- Provide statistics to support narrative
- Elaborate or qualify if necessary

Results: Examples from MPs

The diversity-invasibility hypothesis did not hold true for the diversity treatments. There was no significant difference in the amount of *Microstegium* between treatments for any year (2005-2006: $p=0.3498$; 2007: $p=0.06693$, 2011: $p=0.6182$). A comparison of *Microstegium* presence over time indicates that the plant has spread quickly since restoration in 2005 (Figure 3).

Results: Examples

As can be seen in Regressions (1) and (2), religious contributions have a significantly positive effect on environmental voting patterns for Senators. These results provide evidence that refutes White's thesis. It is important to note, however, that in both regressions, all remaining contributions are also significant. This means that sources of campaign finances that are floating around in the remaining contributions also play a significant role in predicting environmental voting patterns in the Senate.

Results: Examples

In analyzing AURORAxmp's wholesale electricity price output, I focus on the period 2019-2030 because this captures electricity prices prior to alternate natural gas price and tax conditions (2019) through a point ten years after the onset of those alternate conditions (2030). As discussed above, the ten-year window following the onset of unexpected conditions is when the electric system is most vulnerable due to an inability to quickly shift infrastructure.

FitzPatrick, 2013

Results: Tables

- Used to supplement the narrative, not repeat it
- Number your tables
- Gives tables titles
- Arrange tables so they read vertically, not horizontally
- Include units of measurement

Results: Examples of Tables

Table 1: 2011 Net Generation by Fuel Type

Fuel	Southeast	PJM	ISO New England
Coal	46.2	47.3	6.2
Natural Gas	18.6	12.8	50.7
Nuclear	27.4	34.6	27.5
Hydro	5.3	1.9	7.9
Biomass	2.1	1.2	6.1
Wind	<1.0	1.3	<1.0

Data source: SNL Energy, with permission, accessed 5 Dec 2012.

FitzPatrick, 2013

Results: Examples of Tables

Table 2. Occurrences of planted species in SWAMP plots

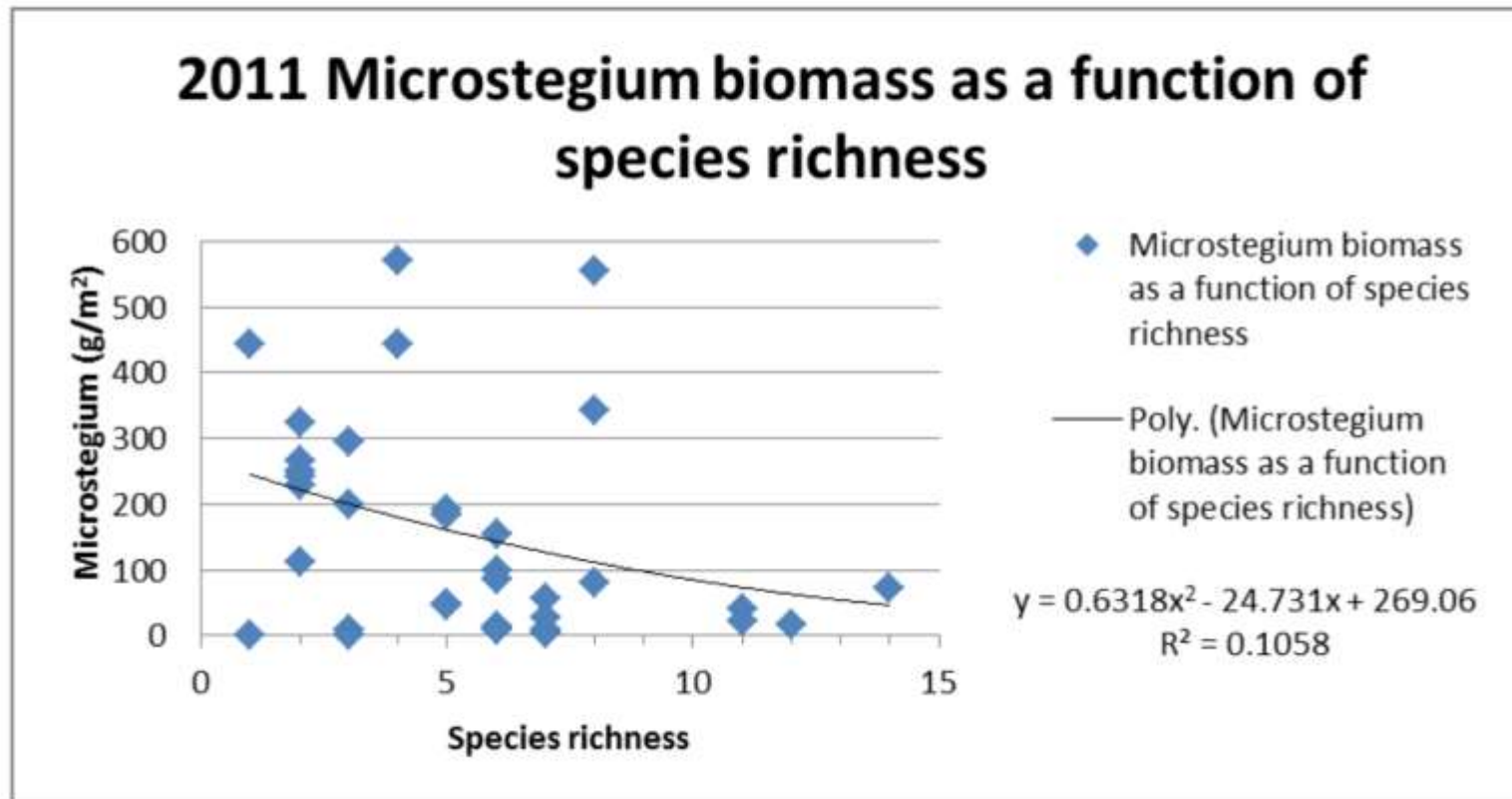
<i>Planted species</i>	<i>Number of plots planted with each species</i>	<i>Number of plots found with each species</i>
<i>Panicum virgatum</i>	17	8
<i>Lobelia cardinalis</i>	15	0
<i>Juncus effusus</i>	14	8
<i>Scirpus cyperinus</i>	14	1
<i>Chasmanthium latifolium</i>	13	11
<i>Vernonia noveboracensis</i>	13	18
<i>Carex crinita</i>	11	3
<i>Eupatoriadelphus fistulosum</i>	11	15
<i>Carex lurida</i>	10	0
<i>Asclepias incarnata</i>	2	0

Results: Figures

- Keep it simple (should be easy to grasp)
- Plot independent variables on the x-axis and dependent variables on the y-axis
- Label each axis and include units
- Number and title figures
- Keep figure sizes and formats consistent

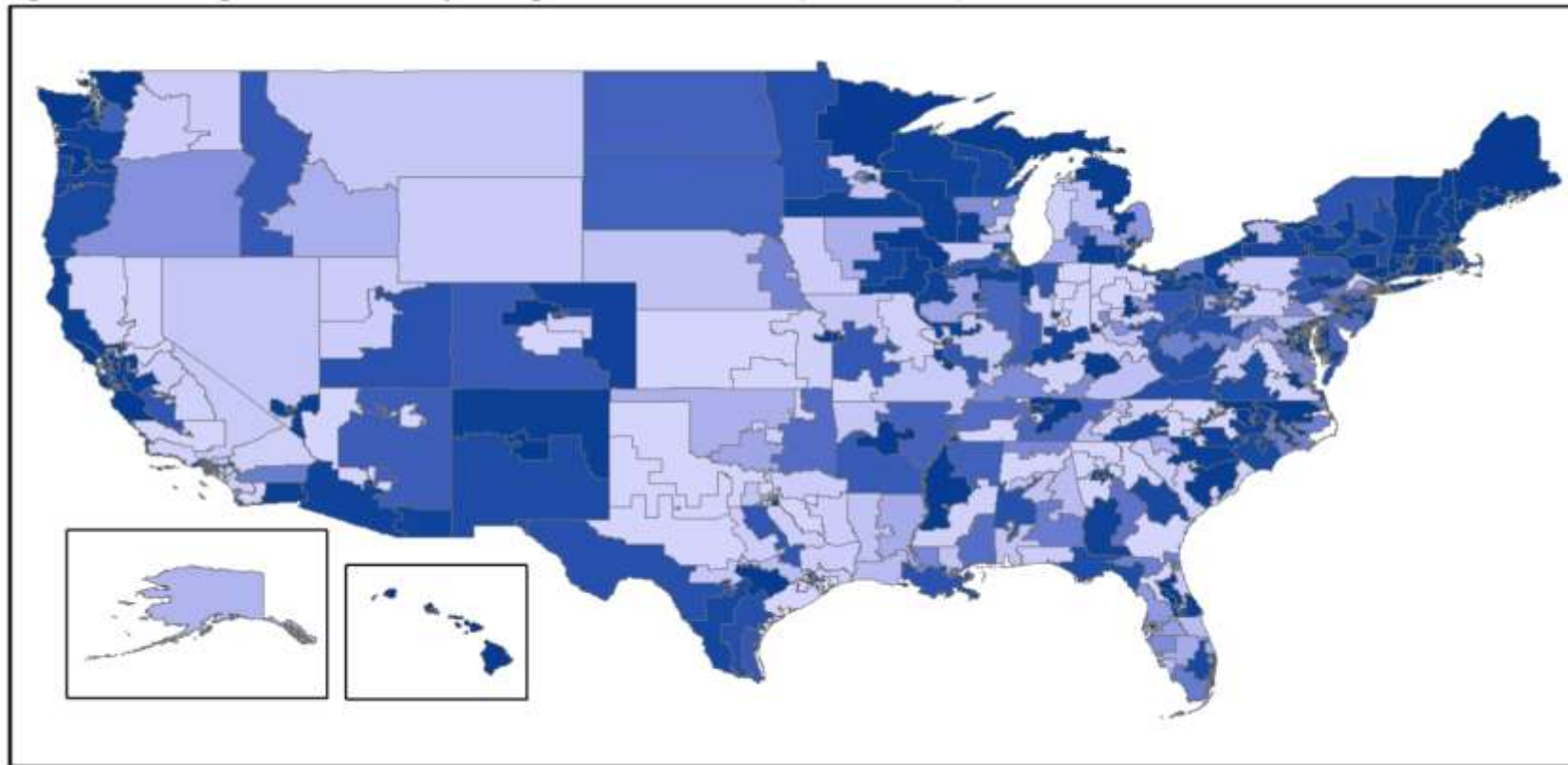
Results: Examples of Figures

Figure 4. Trends in *Microstegium* biomass and species richness



Results: Examples of Figures

Figure 2. Average LCV Score by Congressional District (2009-2010)



Note: A darker shade of blue equates to a higher average LCV score

Fields, 2012

Results: Tips for the Results Section

- Present in order of importance or chronologically
- Report instead of interpreting
- Nothing your reader can dispute should be in the results section
- Feel free to describe trends in data
- Refer to data in past tense

Analyze the Results Sections

What did Gorczyca 2009 do well?

What could be improved in Gorczyca 2009?

Find it here:

Sakai → Resources → MP Module 2 Resource → Gorczyca

Roadmap

- Anatomy of the **Results** section
- Anatomy of the **Discussion**
- Anatomy of the **Introduction**



Discussion

- Interpret the results
- Should move from specific to general

Discussion

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Storytelling

Discussion: What to Include

- Explain your findings (hypotheses, unexpected results)
- Relate findings to previous literature
- Explore theoretical and/or practical implications

Discussion: Explain Your Findings

- Discuss the details of your findings
 - Provide explanations of your results and what the results mean
 - Why are your results meaningful to the field?
- Compare your findings to your hypotheses
 - Acknowledge when your findings deviate from your hypotheses
 - Provide explanations for differences

Discussion: Relate Findings to Previous Literature

- Relate findings to earlier studies
 - Are results in line with the current literature?
 - Does your study make a new contribution to the field?
- Consider alternative explanations
 - What could be contributing to your results?

Discussion: Explore Theoretical/Practical Implications

- How do your findings expand the current understanding of the subject? Do your findings have an application?
- How does your work contribute to the field?
- Does your deliverable have practical uses (i.e. client work, model development)?

Discussion: Examples

Although this study did not find a significant difference in new species richness between edge and non-edge plots, invasive species (excepting *Microstegium*) are confined to edge plots alone. Future studies may find invasive species spreading and intruding into the plots, but it appears that the spread of invasion may have been slowed by some combination of species competition and site conditions.

Edwards, 2012

Discussion: Examples

Based on these results, it can be concluded that contributions from religious organizations play a significant role in Congressional environmental voting patterns in the House. On average, a one-point reduction in a Representative's LCV score in the current cycle will cost a religious organization about \$4,500. Considering the fact that average contributions per cycle from religious organizations to Representatives rarely exceeded \$2,000 between 1990 and 2010, this amount seems fairly high.

Fields, 2012

Discussion: Examples

This advantage is erased when natural gas prices rise and no carbon tax is imposed (see Table 5). All three regions experience a substantial rise in electricity prices, with the steepest increase occurring in ISO New England and PJM. Here we see the pitfall of investing heavily in gas capacity based on forecasted low gas prices.

Discussion: Tips for the Discussion Section

- Discuss each hypotheses or research question in depth
- Do not repeat what you said in the results
- Discuss how results compare to previous literature
- Consider limitations

Discussion: Things to Avoid

- Do not **over interpret** the results
- Do not provide **unwarranted speculation**
- Do not **inflate the importance** of the findings
- Do not discuss **tangential issues**
- Do not **criticize** other published studies in an unprofessional manner
- Do not make **conclusions** that are unsupported by results

Conclusion

- To summarize or not to summarize?
- The purpose is to give readers a sense of the value of your work

Conclusion: What to Include

- Make a connection
- Offer a plan
- Suggest future research
- Recast or further explain the research question

Conclusion: Examples

Any one survey is only going to capture a snapshot of the biotic community, and does not capture the full range of variation over time that the ecosystem will undergo. In order to accomplish successful restorations, scientists should seek to identify a range of ecosystem outcomes that accommodate the variability of natural systems (Hughes, 2005). Further study of SWAMP will shed more light on this question.

Edwards, 2012

Conclusion: Examples

The results presented in this study provide support for Lynn White's thesis with one major caveat. White maintains that the Judeo-Christian roots of our country are solely responsible for the environmental crisis, but this analysis finds it to be a significant, but relatively small, factor. According to these empirical findings, religion does not seem to be the major determinant of environmental policymaking in the U.S. Religiously motivated lobbying provides an incentive not to support environmental legislation, but contributions from religious organizations over the past twenty years have not been large enough to substantially alter Congress member's environmental voting patterns.

Fields, 2012

Conclusion: Examples

The chief finding in this study is that policymakers should strongly consider the uncertainty of future natural gas prices when assessing plans to meet future electricity demands. The large-scale shift to gas generation now being driven by market forces will diminish portfolio diversification and potentially leave ratepayers vulnerable to substantial rate hikes. A rise in gas prices similar to the one in the early 2000s would likely have an even greater impact on a heavily gas-reliant region than was seen then.

FitzPatrick, 2013

Conclusion: Tips for the Conclusion

- Play the “So What?” game
- Return to the theme of the introduction
- Synthesize, don’t summarize

Conclusion: Things to Avoid

- Clichés and overused transitions
- Stating the thesis for the first time in the conclusion
- Introducing a new idea
- Including evidence that should be in the body of the MP

Analyze the Discussion Section

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Introduction

- Introduction to the introduction
- Literature review (AKA Background)
- Problem restatement
- Response restatement
- Roadmap

Introduction to the Introduction

- Establish a research territory (context)
- Establish a niche (problem or significance)
- Occupy the niche (response)

Introduction: Establish Your Territory

- What (briefly) does the reader need to know?
- Basic information
- A quick refresher
- e.g., “Over the past two decades, research in this field has focused on...”

Introduction: Establish Your Niche

- Describe what isn't well-understood yet
- Explain what you want to understand or explore
- Explain *why it matters*
- *e.g.*, “Yet, [topic] is poorly understood. This lack of attention is significant because knowing [this about the topic] will provide this benefit [or not knowing will incur this cost]”

Introduction: Occupy Your Niche

- What are you doing in your research?
- *e.g.*, “To address this problem, I have...”

Introduction: Occupy Your Niche

- What are you doing in your research?
- *e.g.*, “To address this problem, I have...”

Very Fast
2 ¶ Max

Introduction: Occupy Your Niche

- What are you doing in your research?
- *e.g.*, “To address this problem, I have...”

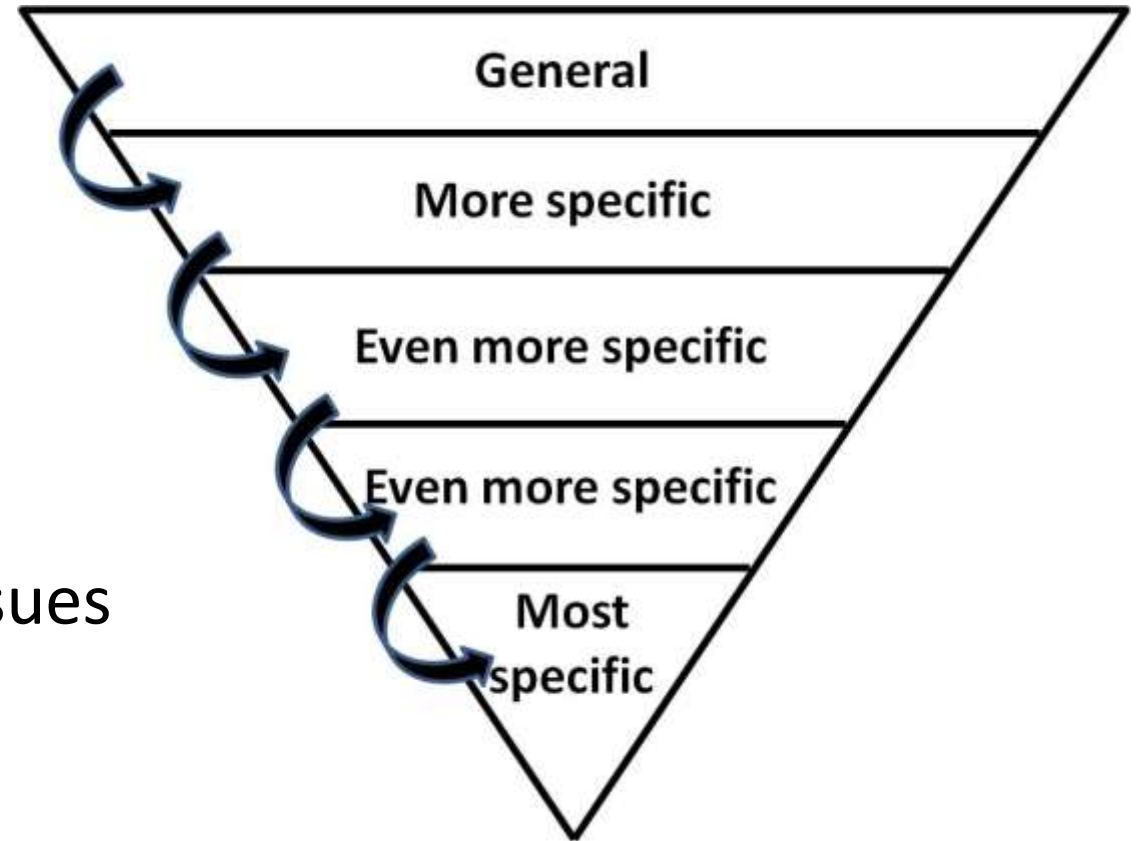
“Instead of telling a story about the twists and turns of our research process, we need to tell the story about our research that the reader needs to hear.”

Introduction: Literature Review

- Provides context
- Synthesizes current knowledge on your question
- Demonstrates why your work is relevant

Introduction: Literature Review

- Usually general → specific
- Organized by topic or focal area
- Articulate pattern in the literature
- Describe “unresolved” academic issues



Introduction: Literature Review

- Identify key authors and journals
- Use computerized searches
- Scan table of contents from key journals
- Use reference lists from relevant articles, books, and book chapters



Introduction: Literature Review

➤ Summarize key findings

- What were the main findings?
- How do these findings relate to previous research?
- What conclusions do researchers draw based on their findings?
- What are the implications of the findings?
- What recommendations are made?

Significance

Introduction: Literature Review

➤ Summarize key methods

- What research designs have been used?
- What were the key variables? What data were collected?
- What were the sample selection procedures
- Were there reliability or validity issues?

Introduction: Literature Review

- Restate the problem (describe in more detail)
- Restate the response (describe in more detail)
 - *e.g.*, “in this MP, I will...” or “given the centrality of x to this, this research intends to y”
- Provide a roadmap
 - *e.g.*, “after a discussion of x, I will turn to y” or “this thesis is divided into 4 parts”

Sign Posts

Analyze the Introduction

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Images

Slide 1: <http://writingcenterworkshop.blogspot.com/p/the-thesis-statement.html>

Slide 2: <https://www.nbn-nrc.org/nonprofit-resource-center/services/training/fundraising-roadmap/>

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