



# Information needs of people who use drugs

- There is very little research that has been conducted into the health information-seeking behaviors of people who inject drugs.
- Most of the work in this area is from the perspective of the researcher, not the person who injects drugs.
- Only two such articles were found in the domain of information science, and six, total, between all academic domains.

## The Review Question

What is currently found in information science literature about the health information that people who inject drugs (PWIDs)

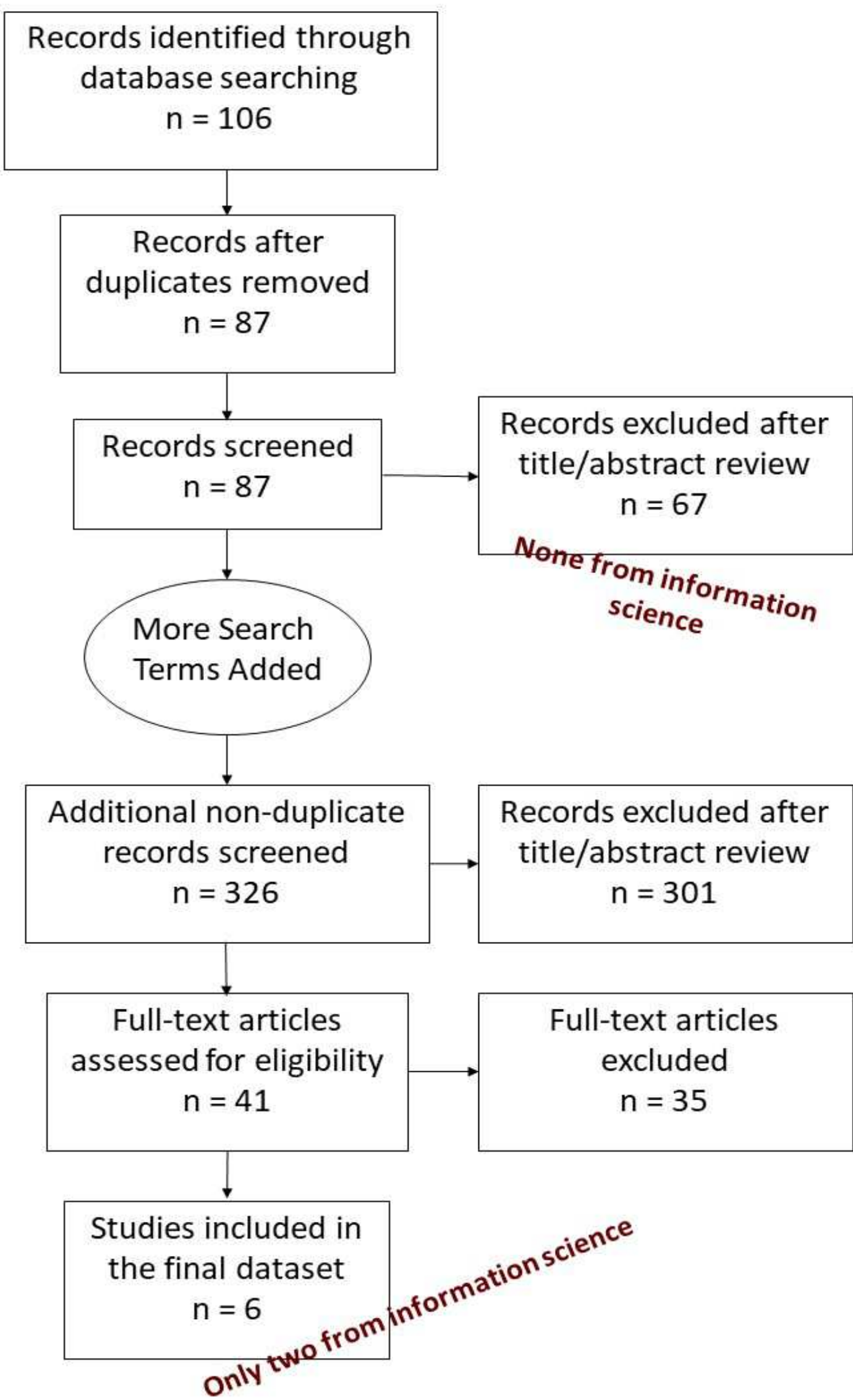
- have access to;
- how they interact with health information;
- what health information they need, and;
- what dissemination means may be most beneficial?

This scoping review will be a thorough examination of the literature that studies the concept of the health information behavior of people who inject drugs. The goal is increase my knowledge to position myself to begin conduct human subjects research in this area so that I **can improve health information services to this disadvantaged population.**

## Databases consulted

- Academic Search Complete
- CINAHL Plus with Full Text
- Com & Mass Media Complete
- Library Lit & , Info Sci Full Text
- Library, Info Sci & Tech Abstracts
- Readers' Guide Full Text Mega
- MEDLINE/PubMed
- SCOPUS
- APA PsycInfo
- Social Services Abstracts
- PAIS International
- Web of Science
- Project Muse

## PRISMA to Create Full Text Sample



### Information needs found in this study:

- Overdose prevention
- Interest in obtaining Narcan and Naloxone
- Desire to avoid fentanyl
- Receipt of general health information without stigma
- Risk engagement in drug/sexual activity
- Infectious disease prevention

## Search Terms

All with OR	AND	all with OR
drug user		health info access
drug abuser		health info needs
drug addict		health info behavior
substance abuse		health info behaviour
substance user		health info barriers
substance abuser		health info seeking
opioid addict		health info promotion
opioid abuse		health info comm*
		health info literacy

These added to second search

All with OR	AND	all with OR
people who inject drugs		health literacy
people who use drugs		
people who use opioids		
opioid use disorder		

## Summary

In the first iteration of searching, I used traditional terms for PWIDs. Getting no information science articles back, I expanded my search terms to the more additional public health terms. I also added health literacy which combines information seeking and discernment.

By doing so, I greatly expanded my recall, but not my precision- evidenced by the number of articles assessed for full-text inclusion.

It appears that the health information behaviors and needs of this population, **from their perspective, and not as reported first by researchers,** is largely unresearched.

This project is now the basis for a study on the health information needs expressed by users of the social media site Reddit on the subreddit, r/opiates. It is my hope that an anonymous internet forum that gets @3,000 posts a month will provide more clarity on this population's health information needs.





# A Mechanism for Axonal Length Sensing

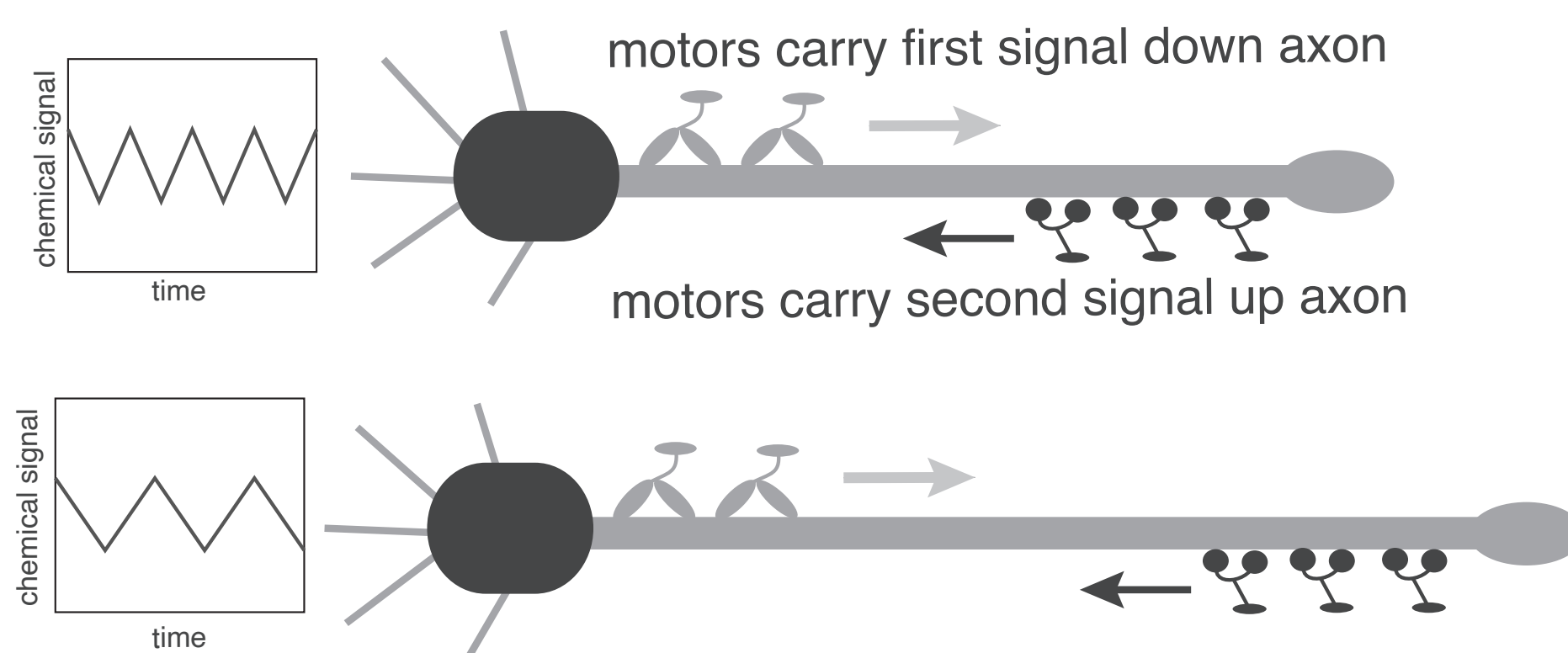
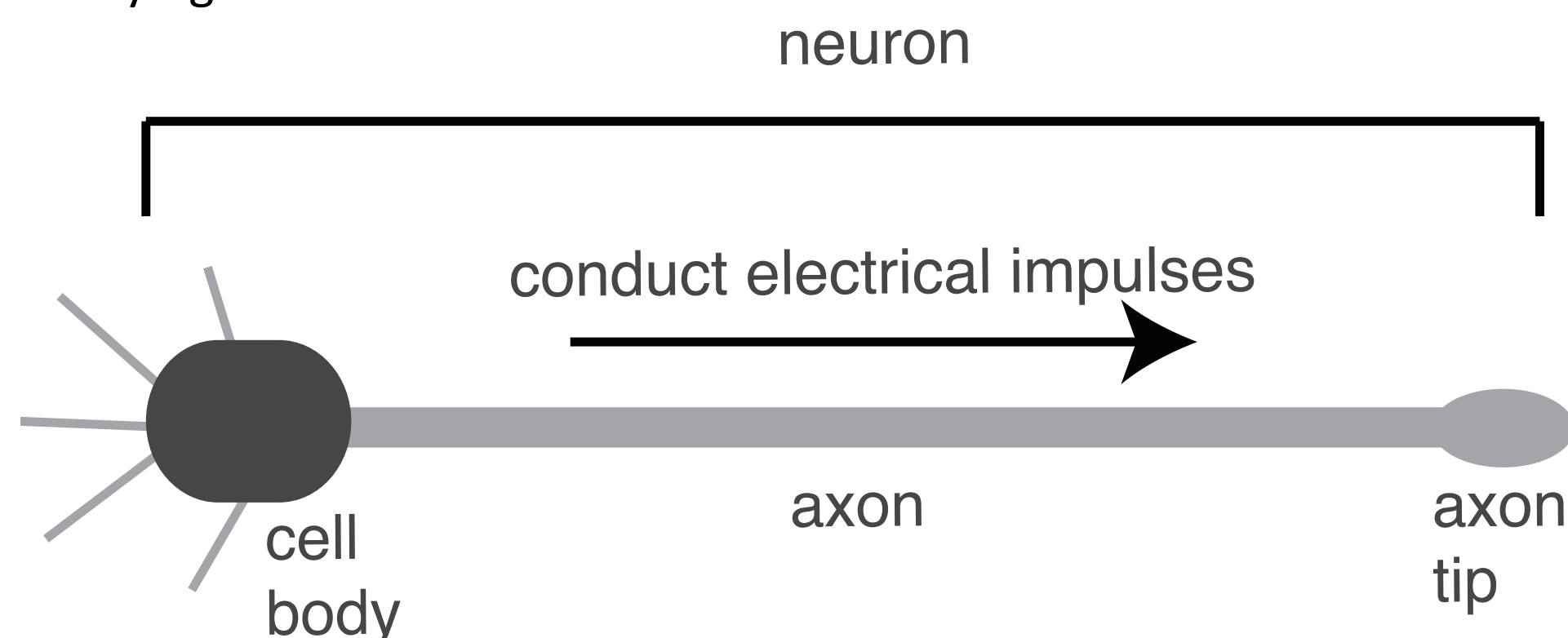
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## Introduction

Axons are long protrusions that emanate from the cell body of a neuron. They conduct electrical impulses to communicate with other neurons, glands, and muscles. Their lengths vary widely within a given organism -- in a human they range from a micron to a meter in length! With such large cell-to-cell variability, it is unclear what the underlying mechanism is for a neuron to sense and control its axonal length.



Recently, a group of experimentalists hypothesized a bidirectional motor transport mechanism for axonal length sensing that would form the front end of a length control mechanism: molecular motors transport a chemical signal from the cell body to the tip of the axon which activates the transport of a second chemical signal back to the cell body. The returning chemical signal represses the production of the first chemical signal via negative feedback, resulting in oscillatory dynamics whose frequency decreases with axon length. If axonal growth rates are correlated with this frequency, then information regarding the length of the axon can be communicated to the cell body. Axonal growth may then be regulated via frequency-dependent activation of gene transcription factors. For this project we will develop a multi-scale model of motor dynamics and chemical signals to show how oscillations emerge and how they are linked to motor dynamics. We also determine how robust the oscillations are to variation in parameters. This research is a first step to uncover mechanisms underlying neurodegenerative diseases such as Alzheimer's or Parkinson's.

## Chemical Signal Dynamics

We model chemical signal dynamics with a system of 4 delay differential equations.

$$\frac{dE_b}{dt} = p_{E,b}(t) - d_{E,b}E_b(t) - w_E J_K E_b(t),$$

$$\frac{dE_t}{dt} = -d_{E,t}E_t(t) + r_V w_E J_K E_b(t - \tau_K)$$

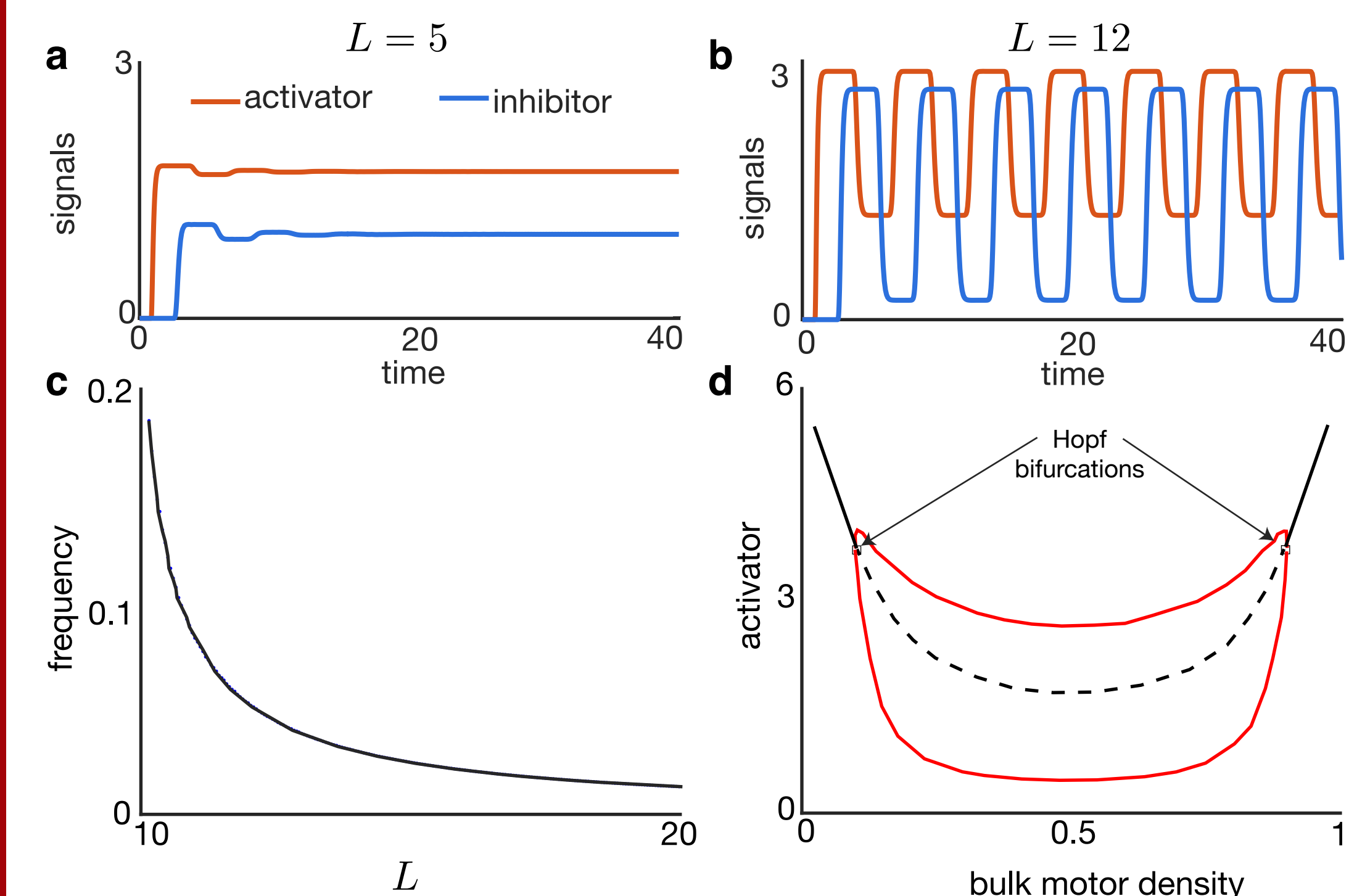
$$\frac{dI_b}{dt} = -d_{I,b}I_b(t) + w_I J_D I_t(t - \tau_D)/r_V,$$

$$\frac{dI_t}{dt} = p_{I,t}(t) - d_{I,t}I_t(t) - w_I J_D I_t(t),$$

Let  $E_b, I_b$  and  $E_t, I_t$  be the concentrations of the excitatory and inhibitory signals at the cell body and axon tip, respectively. Here the delays  $\tau_K$  and  $\tau_D$  represent the time required for motors to traverse the axon. The quantities  $J_K$  and  $J_D$  represent the flow of motors carrying the chemical signals. The system also

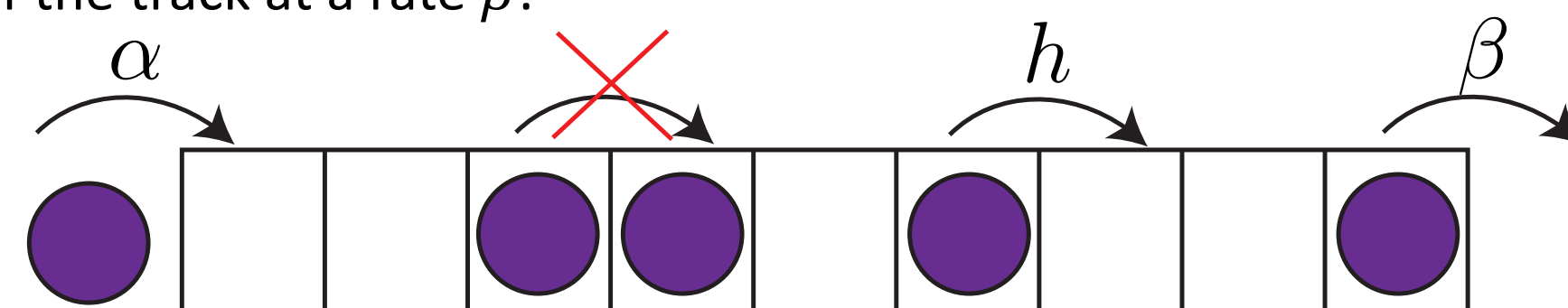
describes production, degradation, excitation, and inhibition of chemical signals.

We find that the dynamics pulse when the delays cross a critical value, and that the delay is linked to microscopic motor dynamics. **Our model thus makes explicit the crucial role delayed negative feedback plays in encoding spatial information.**



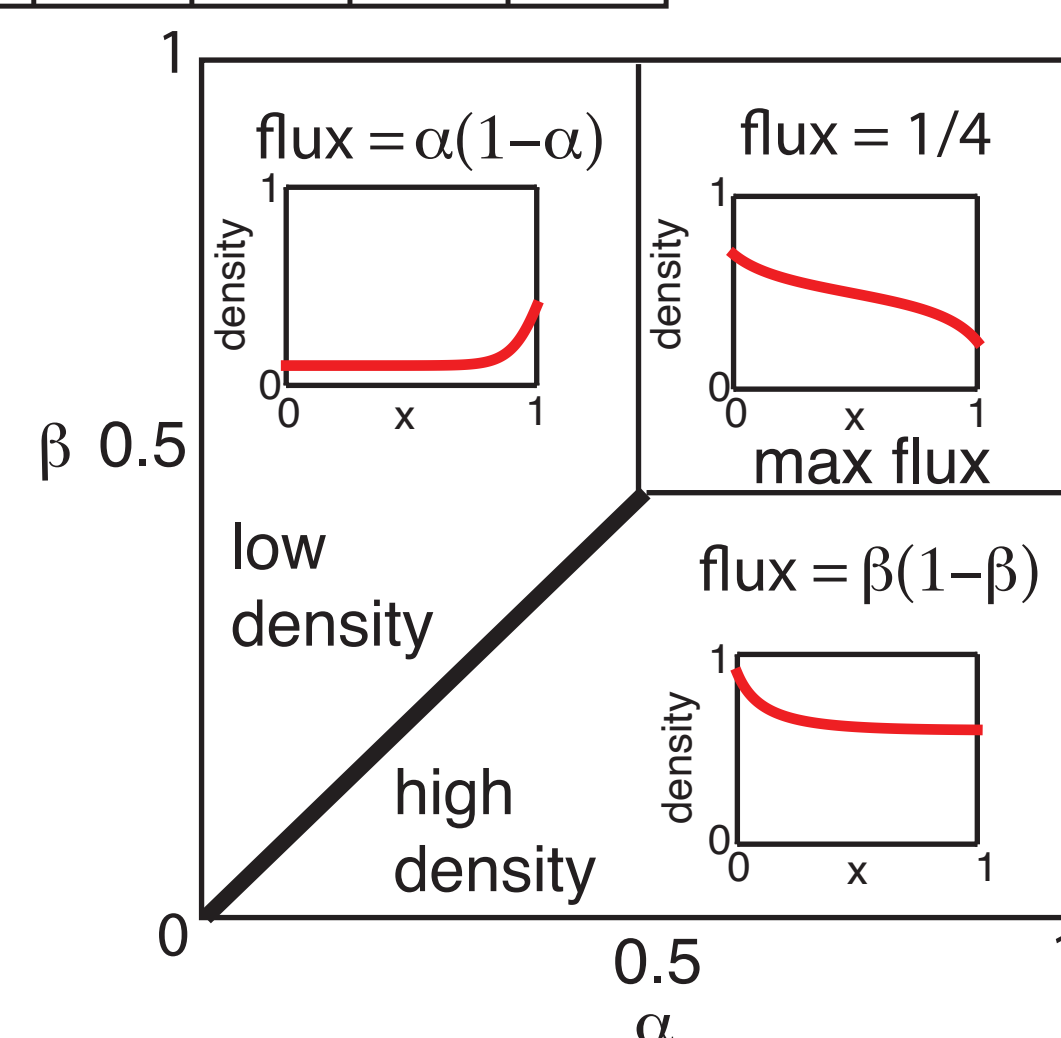
## Model for Motor Dynamics

We model motor dynamics with an exclusion process on a lattice. Consider a motor hopping along a track traversing the whole axon. The track is represented as a lattice of  $N$  sites with spacing  $L/N$ , where  $L$  is axon length. A motor hops to the right at some rate  $h$  if the adjacent site is vacant. A motor enters the lattice at the first site of the track at a rate  $\alpha$  if the site is vacant and may exit the lattice at the last site of the track at a rate  $\beta$ .

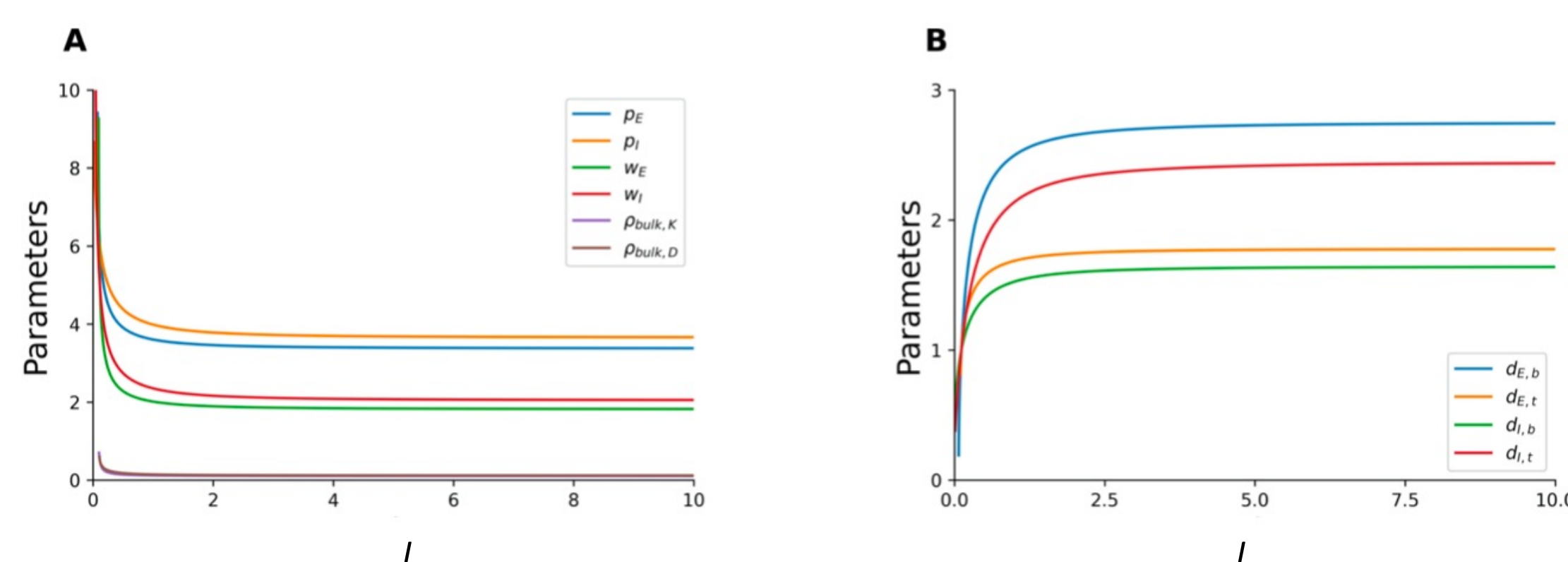


The flow and density of motors is sensitive to parameters  $\alpha$  and  $\beta$ . This means that the dynamics of cargo transported by motors to traverse the axon are strongly correlated with Parameters that dictate motor transport. **Our model is the first to make this link explicit.** Let  $\rho$  be motor density in the axon. Then, we have:

$$\tau = \frac{L}{h(1-\rho)} \quad J = h\rho(1-\rho)$$



## Robustness of Mechanism



The mechanism is robust. As axon length grows, the parameter values at which oscillations begin remain largely unchanged. This is important since we do not desire a mechanism that is sensitive to parameter values. A cell is a noisy, fluctuating place. Circumstances will change, but the mechanism should not!

## References

- Rishal, N. Kam, R. B. T. Perry, V. Shinder, E. M. C. Fisher, G. Schiavo, and M. Fainzilber. "A Motor-Driven Mechanism for Cell-Length Sensing". *Cell Reports*, Vol 1, No. 6, pp. 608-616 (2012)
- B. R. Karamched and P. C. Bressloff. "Delayed Feedback Model of Axon Length Sensing". *Biophysical Journal*, Vol. 108, No. 9, pp. 2408-2419 (2015)

## Takeaways and Future Directions

- We developed a model that links microscopic properties (motor dynamics) to macroscopic properties (chemical signal dynamics)
- The model makes explicit the crucial role delayed feedback plays in generating oscillations and provides a mathematical foundation for a plausible axon length sensing mechanism.
- The model is robust to parameters; thus, it encodes spatial information reliably
- We next ask: how does the axon decode information? We will feed the chemical signal into a gene network and investigate how protein production can be used to sense spatial information.

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# Green vs. Gray Infrastructure: Enhancing sustainable communities with green infrastructure planning



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## Introduction

- Stormwater best management practices (BMPs) are effective watershed management strategies to control nutrients, restore watersheds and achieve water quality goals
- Lack of understanding on the effectiveness of the BMPs in nutrient control
- Improvements in the understanding of how BMPs affect nutrients in urban areas will help planners and decision makers to select the optimal management strategies for achieving watershed restoration goals.

## Objectives

- development of a framework to 1) evaluate existing **nutrient reduction plans** to determine if they effectively decrease nutrient loading and 2) **identify the optimal configuration** and combination of BMPs to control excess nutrients in the watershed

## Summary of Findings

- BMPs including wet detention ponds, baffle boxes, alum treatment, improved wastewater treatment systems, and restoration of natural were the most effective strategies to control excess nutrients.
- A total of 48 locations for potential siting of structural BMPs were identified and only 11 of the 48 identified sites are recommended as potential structural BMPs locations based on the established criteria in this study.

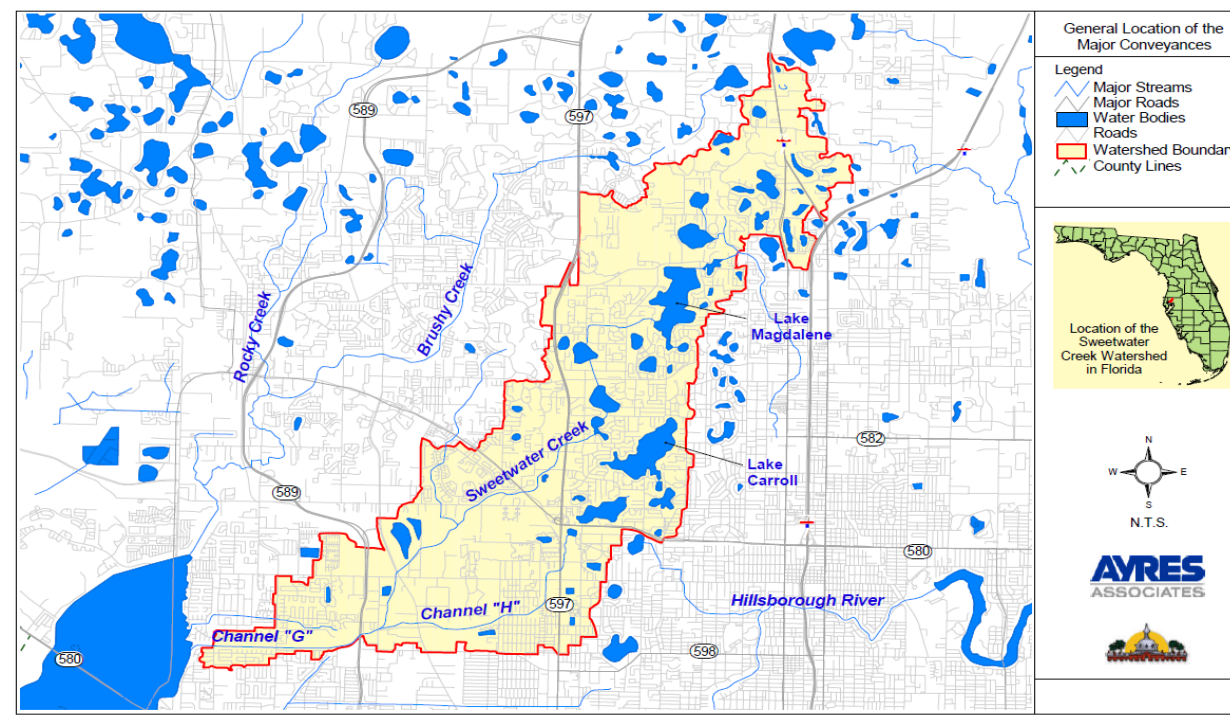


Figure 1. Sweetwater Creek Watershed.

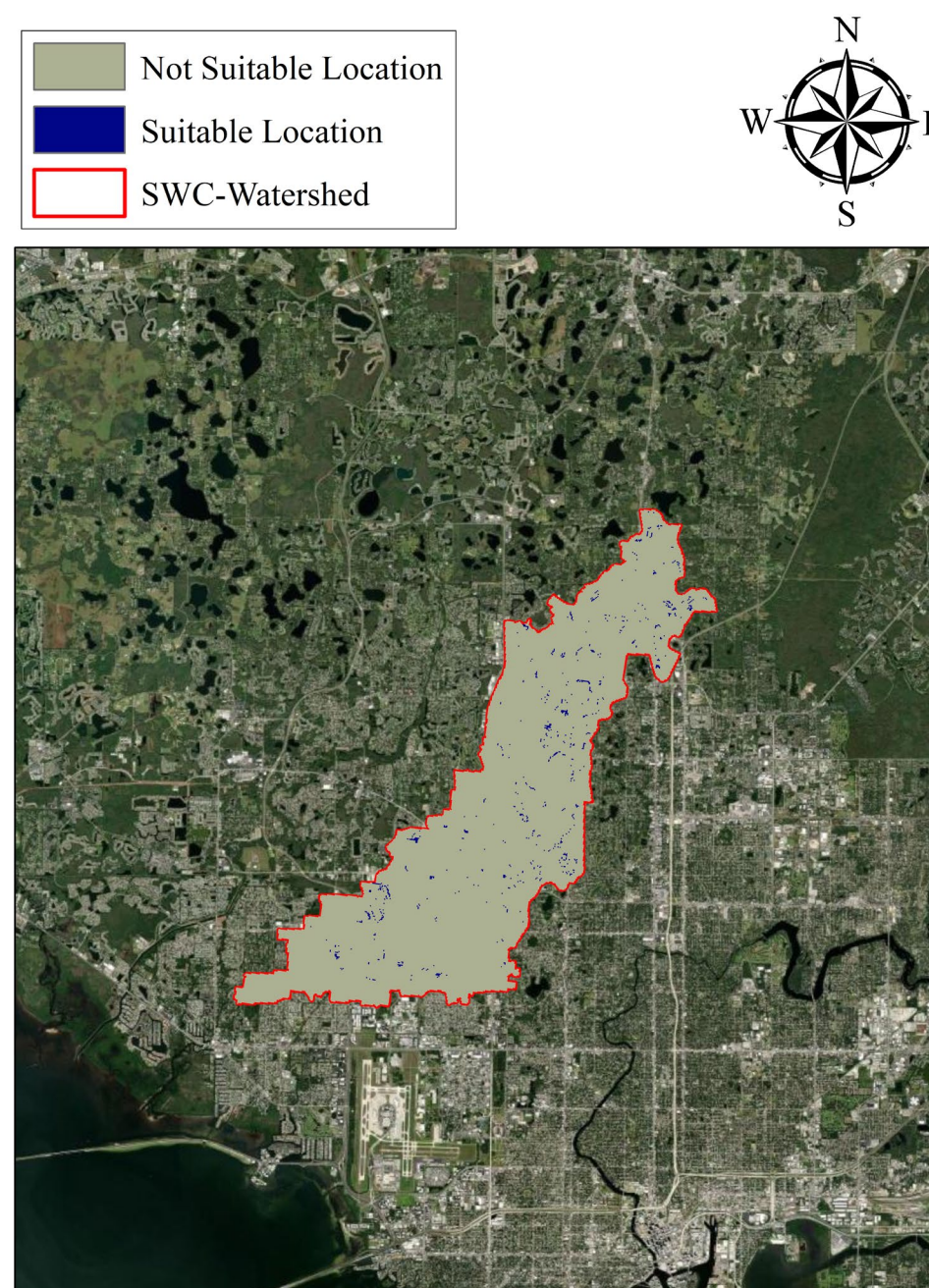


Figure 3. Suitable locations for BMP implementation

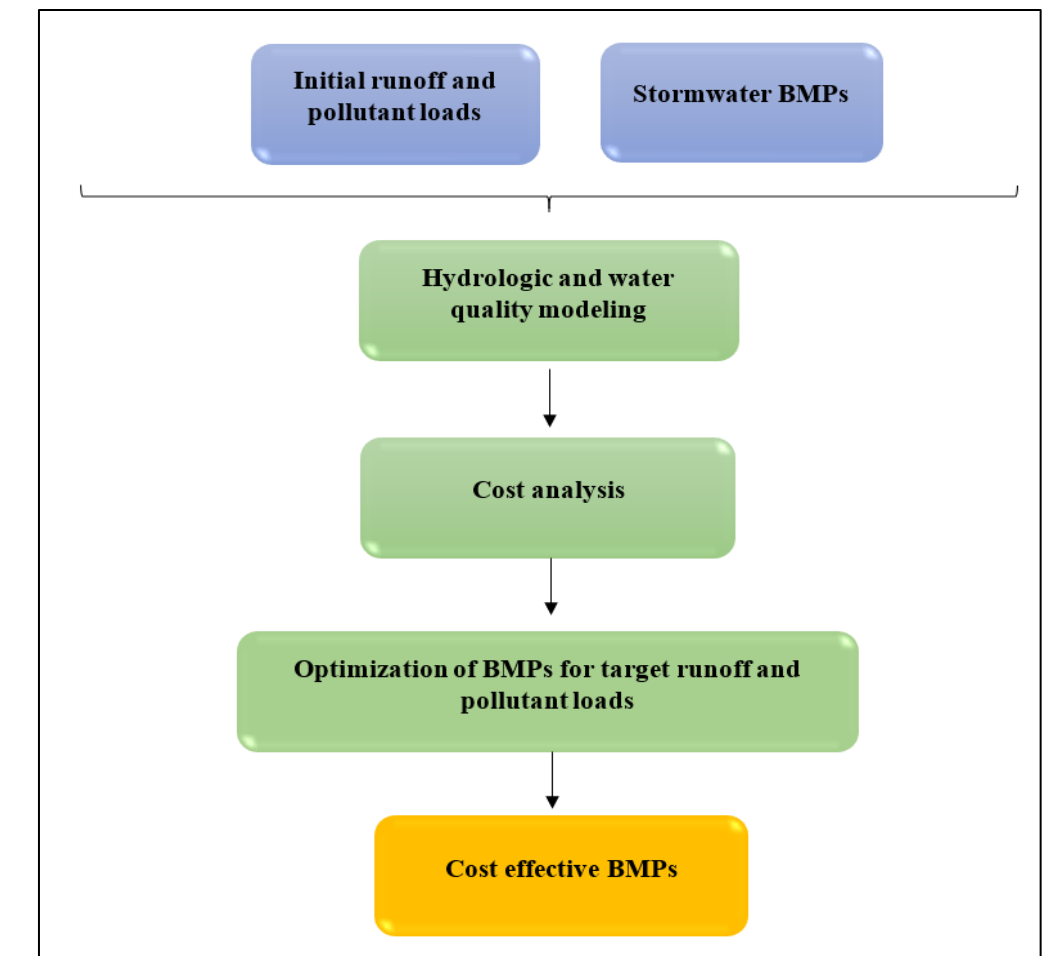


Figure 2. Conceptual Framework of Planning Tool

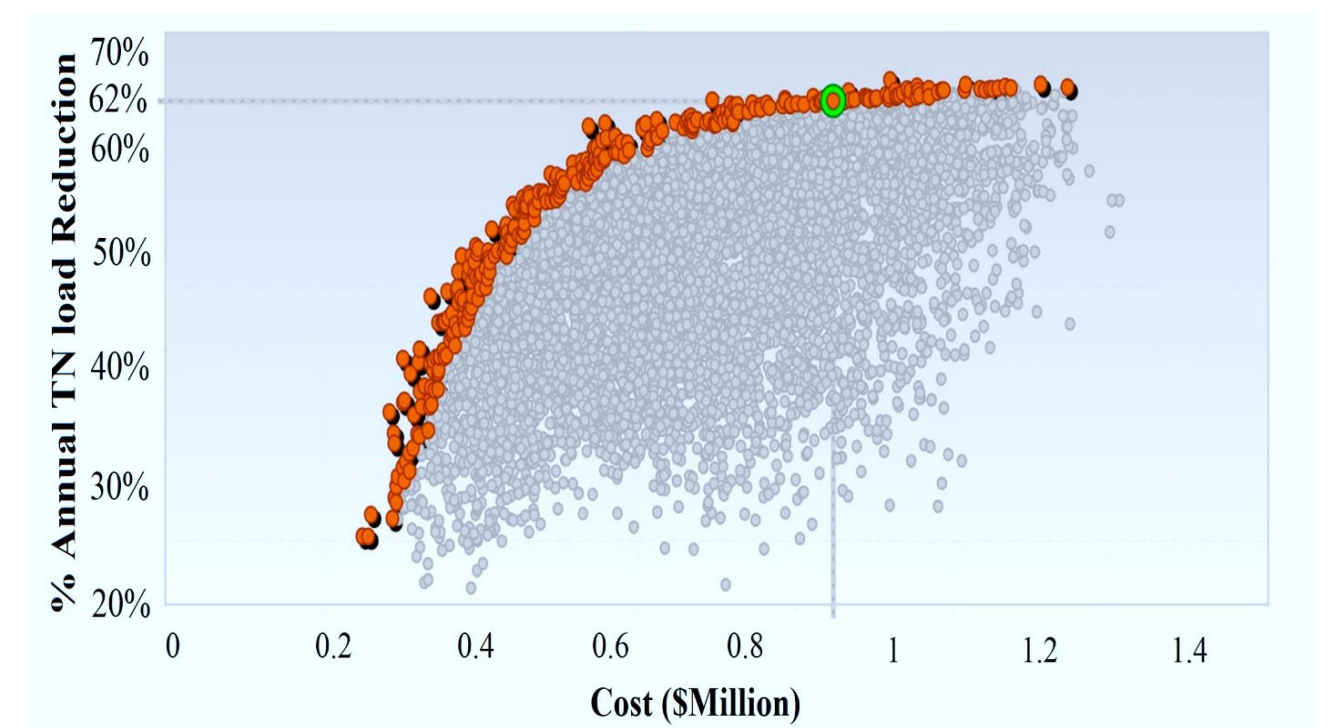


Figure 4. Cost-effectiveness curve

## Broader Impacts

- Assist water resources managers and decision makers in better management of nutrients and subsequently algae blooms through implementation of BMPs, thereby addressing the challenges in the coastal ecosystem.
- The results will not only benefit Tampa, but also can be broadly applicable to other urban watersheds across the state of Florida.

## Future Research

- Generate the necessary data to strength our proposed future investigations on BMP effectiveness.
- Advance the ability to identify the most resilient and cost-effectiveness BMPs to mitigate the impacts of flooding and nutrients in shallow groundwater environments.
- Evaluate the role of nature-based solutions (e.g., BMPs) for mitigating short- and long-term implications of sea level rise in coastal regions.



# The Prophetess Unveiled: Religious Authority and Ambiguous Gender in the Art of the Medieval Bible

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## Background

In the eleventh-century Roda Bible, a manuscript produced at the monastery of Santa Maria de Ripoll in Catalonia (Spain), monks illustrated the Book of Judges with an image of Deborah, a prophetess and judge of the Hebrew Bible who had the additional distinction of acting as a military leader (Judges 4–5; **Fig. 1**). Deborah appears on a mountainside, where she stands above the figure of Barak and urges him to lead an army of Israelite tribes against the Canaanite forces. Barak agrees on the condition that Deborah accompany him: “If thou wilt come with me, I will go: if thou wilt not come with me, I will not go” (Judges 4:8).

Deborah’s portrayal reveals the monks’ reception of such an individual: in contrast to the surrounding men, she wears the long robes associated with patriarchs, prophets, and others with privileged access to God; yet unlike other women in the Roda Bible, her head is unveiled to reveal shortly cropped hair.

## Summary of Findings

The short-haired Deborah in the Roda Bible is among the earliest surviving portrayals of the prophetess, and an unexpected depiction of a woman’s masculinity to signal full domination of body and spirit—one of the great aspirations among monastic communities of the Middle Ages.

## Evidence and Conclusions

Biblical interpreters traditionally read Judges 4 and 5 as narratives designed to unsettle expectations of men’s and women’s behaviors. In foregrounding an unexpectedly authoritative woman and a military leader’s failed masculinity, the story reinforces the binary of masculine and feminine. Arguably, this interpretation applies to later representations of Deborah in manuscripts intended for courtly rather than monastic audiences. In a thirteenth-century example, she is an incongruous figure within the warfare scene (**Fig. 2**).

Without martial or marital roles in society, the cloistered readers of the Roda Bible would have been far less concerned with maintaining their power and virility than with attaining their religious ideals. The Roda Bible’s Judges illustration does not draw attention to gender differences, instead aligning Deborah’s appearance with that of young men and angelic beings in the same manuscript.

In the context of other illustrations produced at Ripoll, as well as theological texts on brave women’s ability to “overcome” or “transgress” their sex, the gender-nonconforming Deborah from Santa Maria de Ripoll emerges as a model for ideal monastic behavior rather than a prescriptive image about the differences between men and women.



Fig. 1: Deborah (in yellow and orange) and Barak on Mount Tabor, Roda Bible, eleventh century (Paris, Bibliothèque nationale de France, MS lat. 6, vol. 1, fol. 99v detail)



Fig. 2: Deborah and the Israelite forces, Morgan Picture Bible, thirteenth century (New York, Pierpoint Morgan Library, MS M.638, fol. 12r, detail)

## Future Research

In her recent piece on “Medieval Masculinities without Men,” Karma Lochrie calls for the expansion of medieval masculinity studies to include masculine women.<sup>1</sup> While there has been preliminary work on masculine women in medieval literature and saints’ lives, the present research represents a new direction in the underdeveloped field of masculine women in the art of the Middle Ages. Future directions for the project will include the study of angelic beings in medieval text and image. These sources might similarly reflect ideas about ambiguous gender expression as a sign of admirable character or proximity to the divine.

<sup>1</sup> Karma Lochrie, “Medieval Masculinities without Men,” in *Rivalrous Masculinities: New Directions in Medieval Gender Studies*, ed. Ann Marie Rasmussen (Notre Dame, IN: University of Notre Dame Press, 2019), 209–33, at 210–11.



# HOW COMMUNITY POLICING AFFECTS POLICE OFFICERS

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## RESEARCH QUESTION

How does community policing affect police officer attitudes?

## BACKGROUND

### Conventional Wisdom

- Community policing affects **CITIZEN** attitudes, trust, and crime reporting

### What's missing

- In policing, trust is a two-way street
- Poor policing also results from **OFFICER** ignorance, mistrust and fear
- To date, almost no evidence on how community policing affects officers

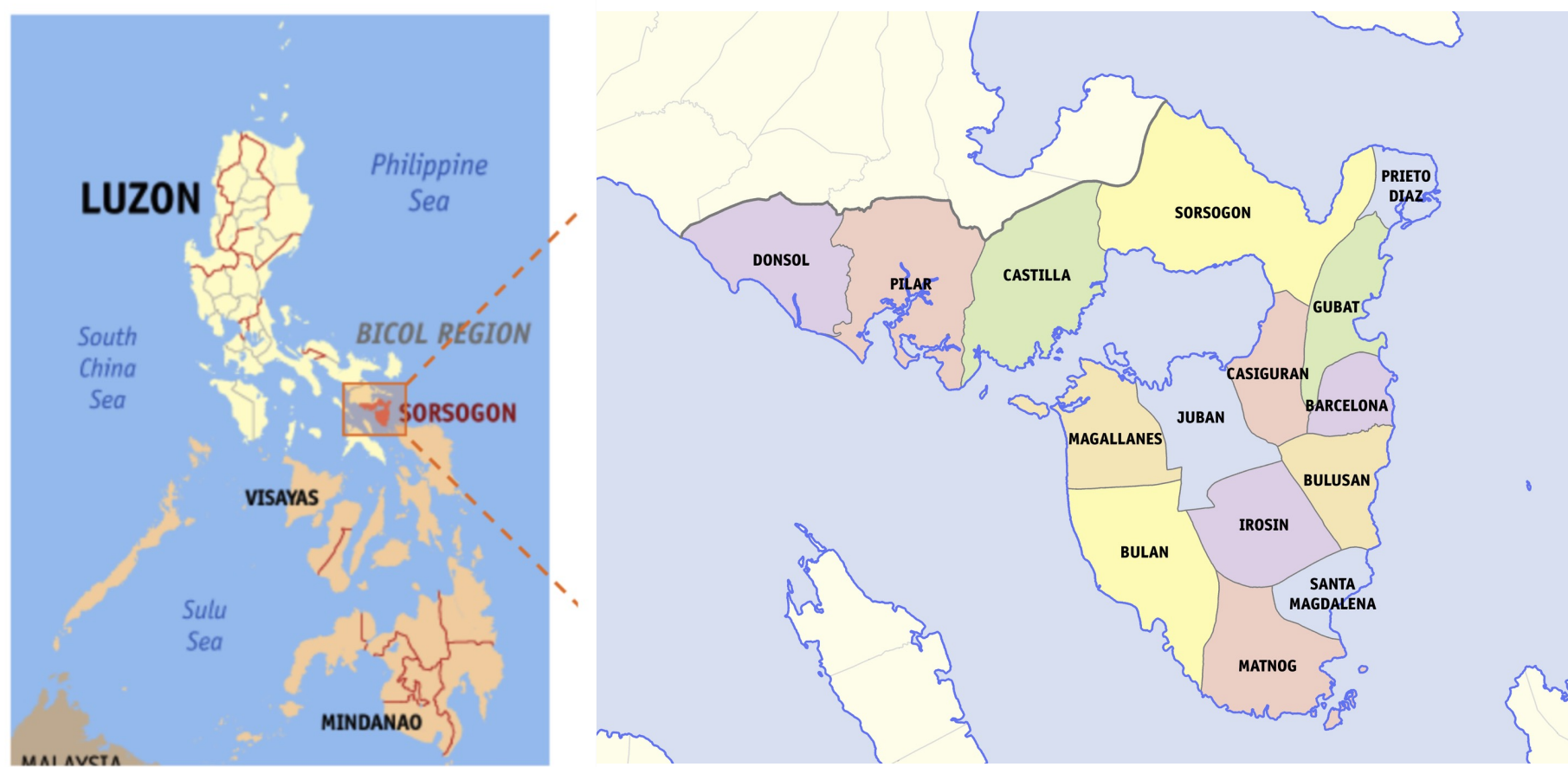
## HYPOTHESES

Participation in community policing will increase officer:

- Knowledge** about citizen needs
- Trust** in citizen motivations
- Empathy** towards citizen concerns
- Accountability** for interactions with citizens

## COMMUNITY POLICING EXPERIMENT

Context: 8-month community policing program in Sorsogon Province in **the Philippines** (pop 850,000)



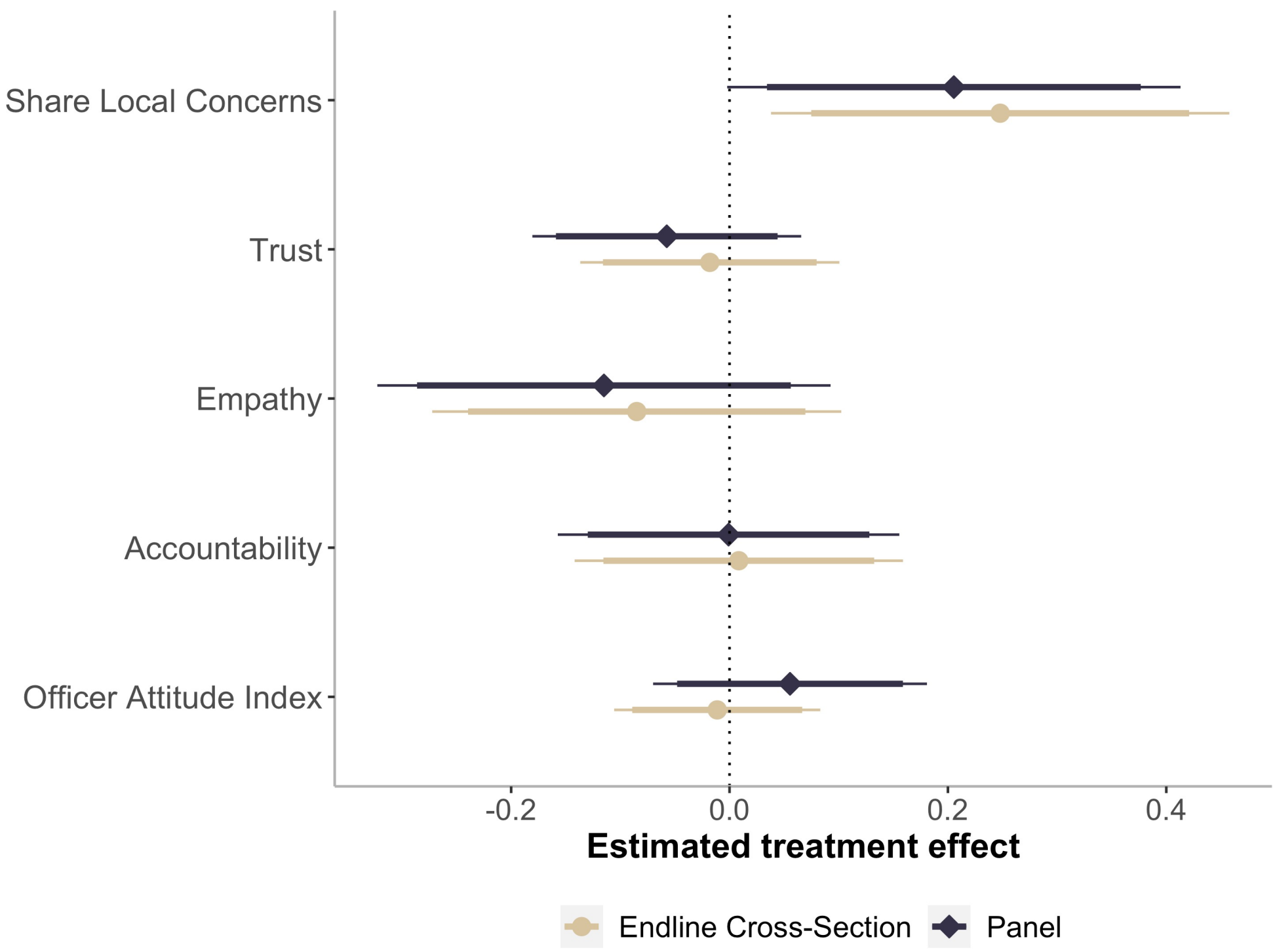
Working with the Philippine National Police, we **randomly assigned** which officers participated in the province-wide community policing program.

236 officers  
Community Policing  
Treatment

537 officers  
Community Policing  
Control

## RESULTS

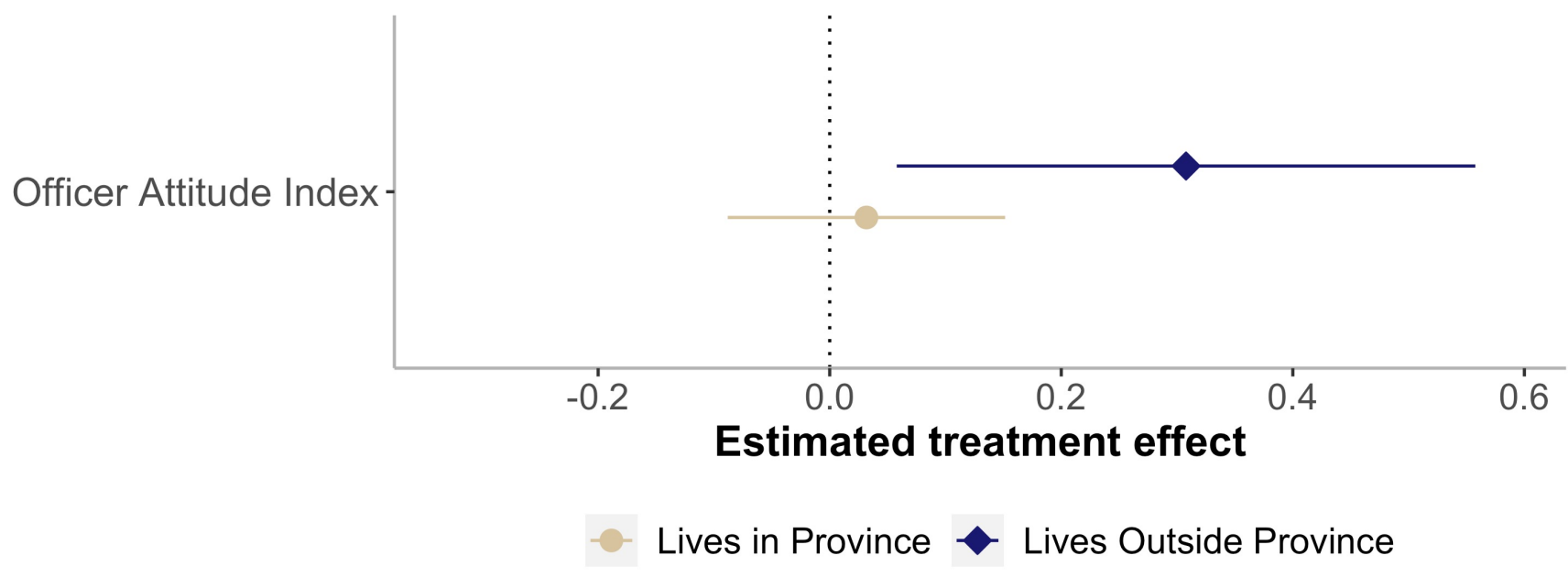
- ✓ Community policing increased officer **knowledge**
- ✗ But it did NOT improve **trust**, **empathy**, **accountability**



## WHAT EXPLAINS THE RESULT?

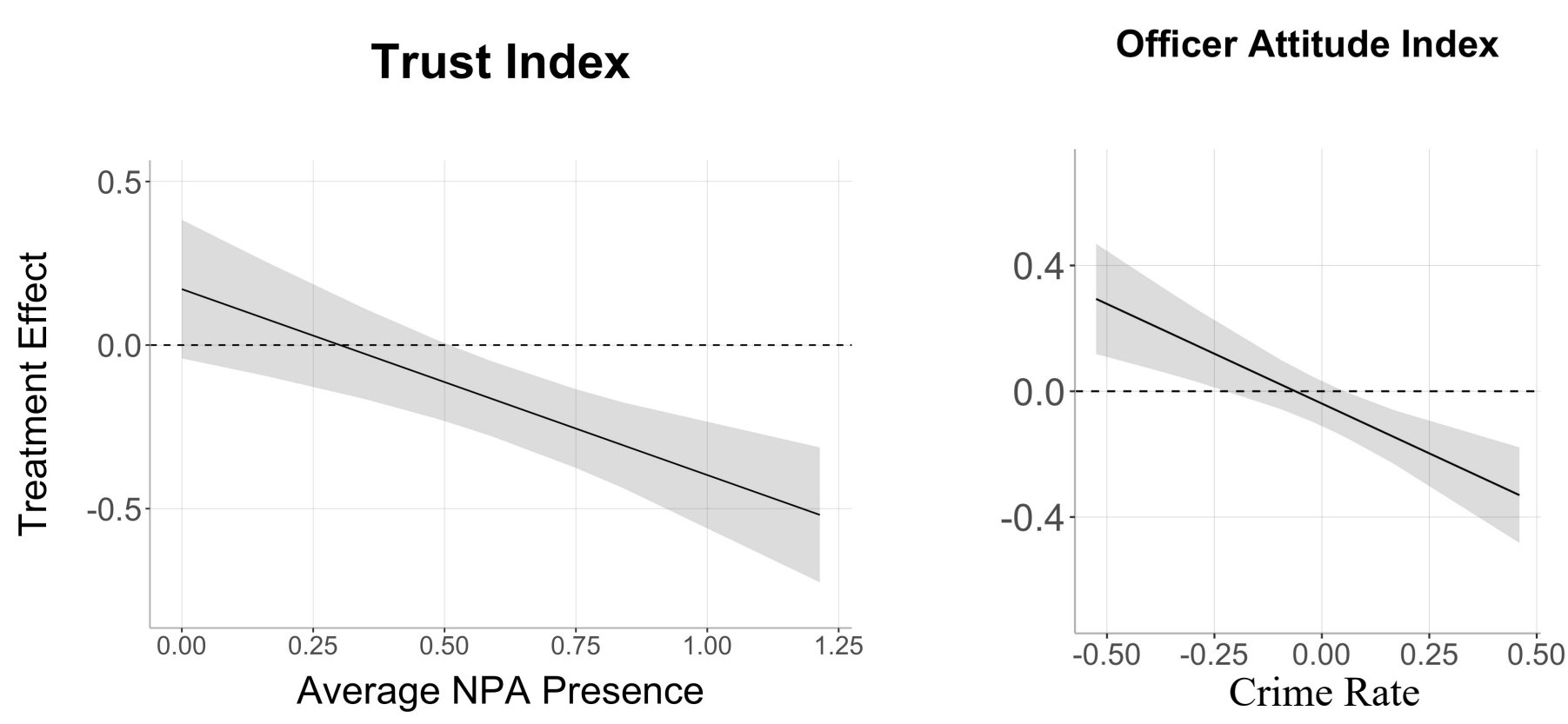
### 1) Officer “Embeddedness”

Positive effects among officers from different provinces, but no effect among “local” officers with formed opinions



### 2) Officer Safety Concerns

Officers who conducted community policing in areas with high crime or insurgent presence saw worse attitudes.



## CONCLUSION

- Simple assumptions about the effect of community policing on officers do not pan out.
- Instead, the effects are highly contingent on 1) WHO the participating officers are and 2) the safety context of WHERE they are assigned.



# Towards eliminating rural digital inequality: A study of rural electric cooperatives (RECs) as broadband service providers

## The phenomena of interest

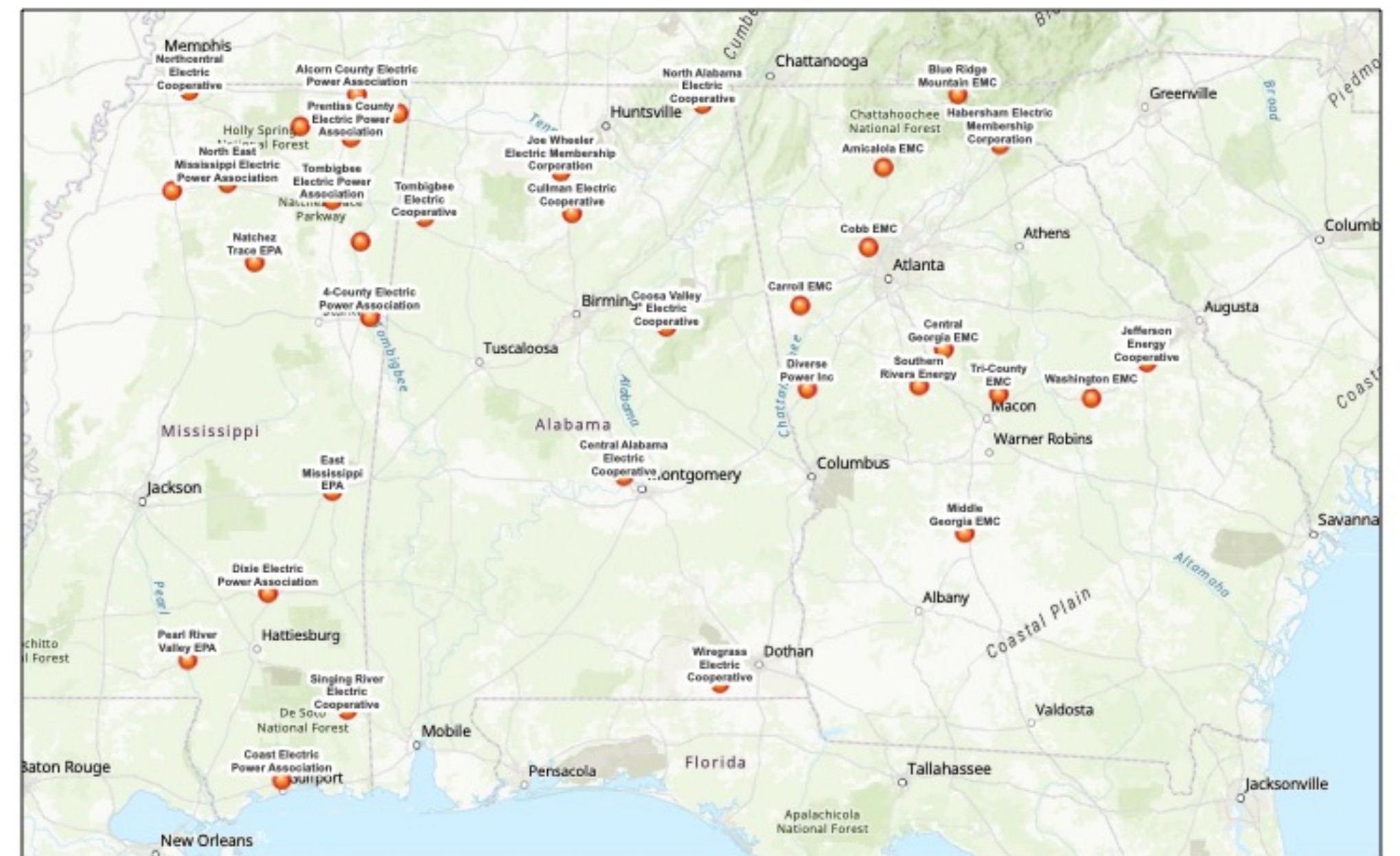
- 35% of people residing in rural communities in the US lack access to broadband internet service
- Few large telecommunications companies are interested in serving rural areas due to low ROI
- Nationally, more than 150 out of 900+ rural electric cooperatives (RECs) have started to offer fiber broadband internet service, but they face varying internal and external challenges to successfully building infrastructure and offering service

## Exploratory study objectives

- Develop a grounded understanding of REC leaders' strategic decisions to build infrastructure and offer broadband service
- Generate hypotheses about the internal and external characteristics that enable and constrain RECs' broadband strategy

## Method

- Comparative case study design, incorporating interviews with REC senior leadership, document review (annual reports, tax returns, media coverage), and visualizing geospatial data
- Study scoped to 3 Southeastern states where RECs operate broadband service (AL, GA, MS)



RECs with planned or actual fiber broadband service in states of study

## Initial findings

- *Strategy drivers:* Community socioeconomic development needs, grid modernization, mission relevance, imitation
- *Characteristics influencing strategy:* Access to funding, cooperative governance, regulatory environment, conservative approach to risk
- *Organizational learning:* Discrepancy in institutional logics of for-profit telecom service and not-for-profit electric service (e.g., differing norms for technical support and customer service)

## Next steps

- Follow-up interviews with REC senior leadership
- Expand participation to additional RECs, conduct site visits
- NSF grant proposal development



# Exploration of the atmospheric boundary layer near urban areas in observations and high-resolution models

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## Overarching Research Question

*To what extent do current weather prediction models accurately represent lower atmospheric conditions near urban areas during a variety of weather events?*

More than half of the world’s population resides within cities, creating very dense populations compared to rural regions; by 2050, more than two out of every three inhabitants will live in a city<sup>1</sup>. Consequently, the vulnerability of urban residents is amplified during impact weather and climate events. The ability of forecasters to accurately predict weather is primarily dependent upon land-based observation networks and numerical weather models. Current generation high-resolution models are limited by computationally expensive physics and modeling components and, consequently, omit urbanization schemes. Forecasters must utilize complementary information to provide accurate forecasts to end-users including the commercial sector and general public<sup>2</sup>. Urban climate literature has consistently documented the impact of cities on the immediate environment<sup>3-5</sup>. Many of these studies focus on individual cities and are limited to near-surface atmospheric manifestations of land cover and land use change<sup>6</sup>. Research focusing on the lowest kilometer of the atmosphere above building height, or the urban boundary layer (UBL), is limited but this area may influence weather events and their predictability in high-impact scenarios. This project aims to address this deficiency in published research.



## What is the atmospheric boundary layer?

The reflection of urbanization is not only present at the surface but extends beyond the tree and building canopy into the planetary boundary layer, the portion of the atmosphere subject to vertical mixing due to heating of the Earth’s surface<sup>7</sup>. The height of the boundary layer increases during the daylight hours as incoming solar radiation actively warms the surface causing air to rise and fall turbulently. The boundary layer ceiling decreases at night as surface-based buoyancy diminishes. The boundary layer is bounded at its maximum height where the influence of mixing due to surface heating and friction go to zero. The layer above this level is the free atmosphere.

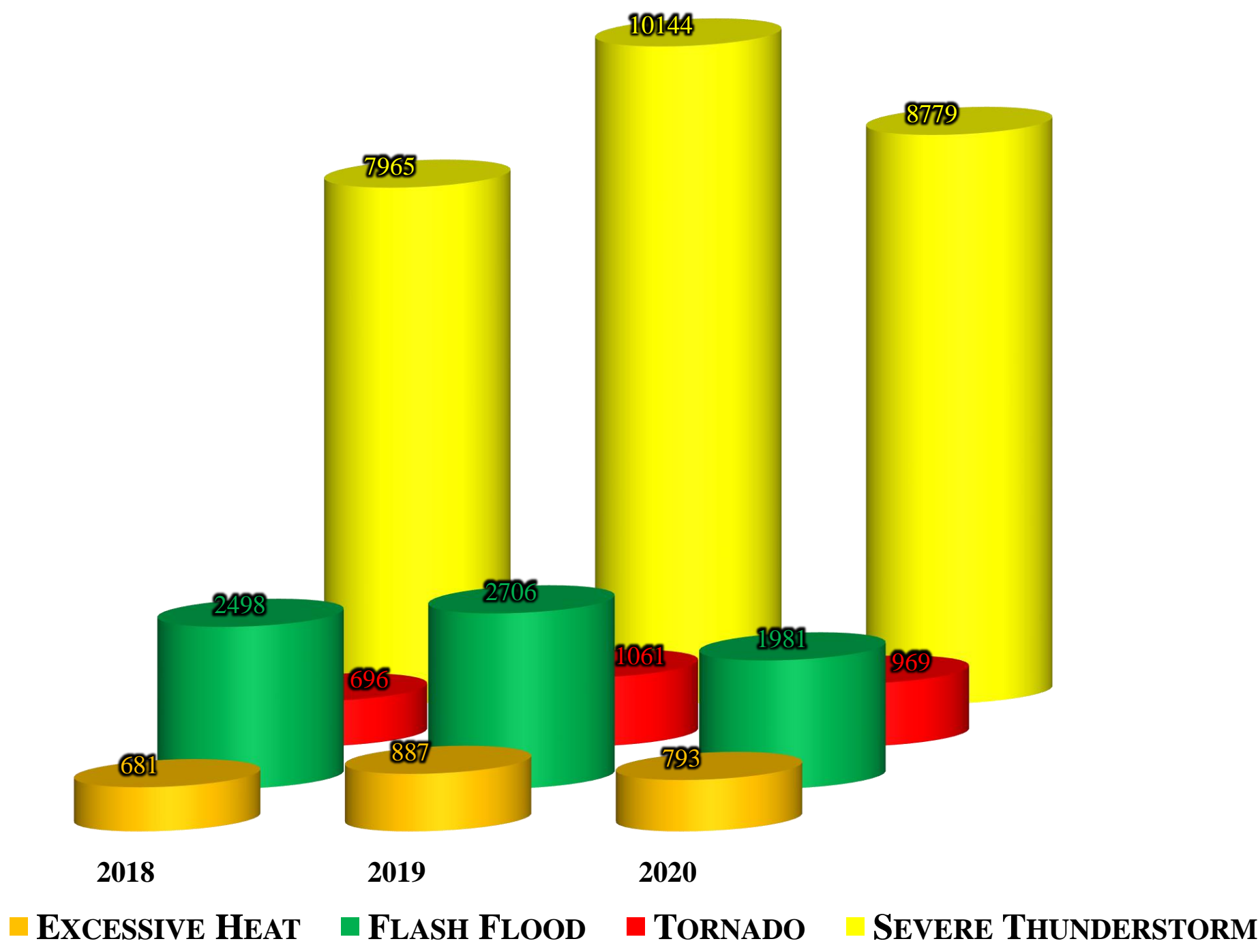
## Hypothesis

*Operational weather models initialize with greater error near urban areas during high impact weather events.*

United States forecasting agencies do not currently incorporate urban-scale parameterizations into their numerical prediction modeling suites. Despite this technical shortcoming, forecasters are tasked with using complementary evidence to provide accurate forecasts during high-impact events. Since urban climate research shows that cities can impact weather from local to regional scales, determining the utility of current observation networks and high-resolution models across weather scenarios becomes important in meeting information demands of the public and commercial entities. This project adds to the existing body of research by analyzing modeling capability near densely populated urban environments in the continental United States.

## Data

**Modeling output.** The National Oceanic and Atmospheric Administration’s (NOAA) National Weather Service (NWS) has historically implemented three generations of higher resolution models in their daily scheduled operational suite – the Rapid Update Cycle, the Rapid Refresh, and the High-Resolution Rapid Refresh. Archived model output data will be filtered by location and selected dates. **Weather events.** The NOAA National Centers for Environmental Information archives weather station data from multiple current and historical sites across the nation. The data contain variables such as temperature, wind speed and direction, dewpoint, precipitation type and amount, and heat indices. **Boundary layer observations.** Twice daily, NOAA NWS offices simultaneously release weather balloons to measure upper air properties such as temperature, moisture, and wind speed.



## NWS-issued warnings in major U.S. metropolitan areas (2018 – 2020).

Data courtesy of NOAA/NWS.

## Objectives

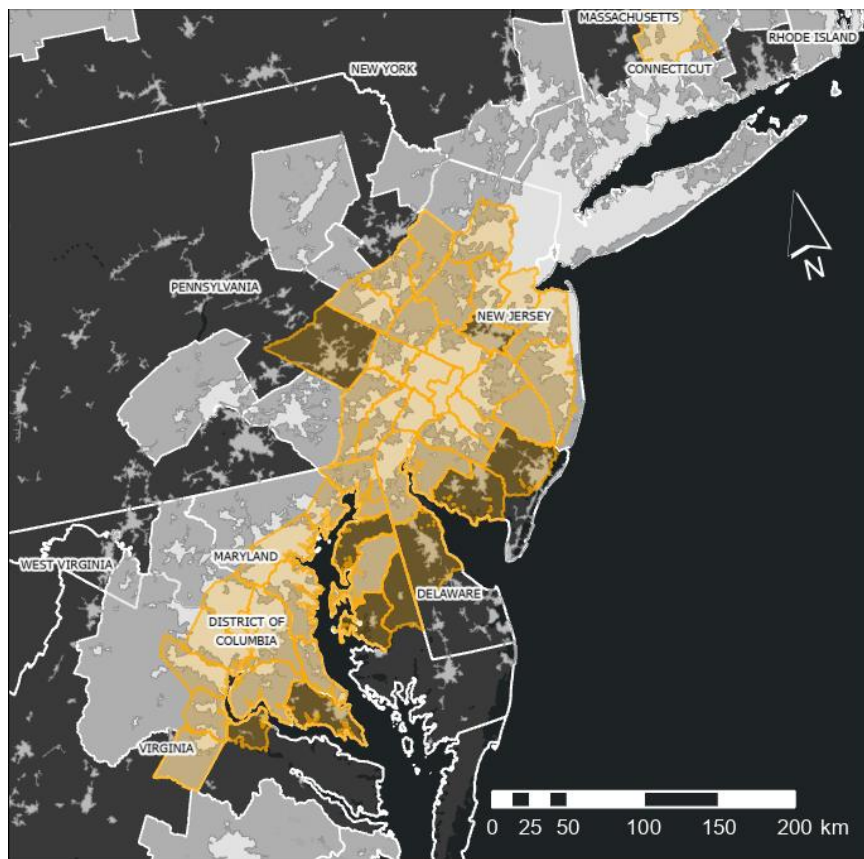
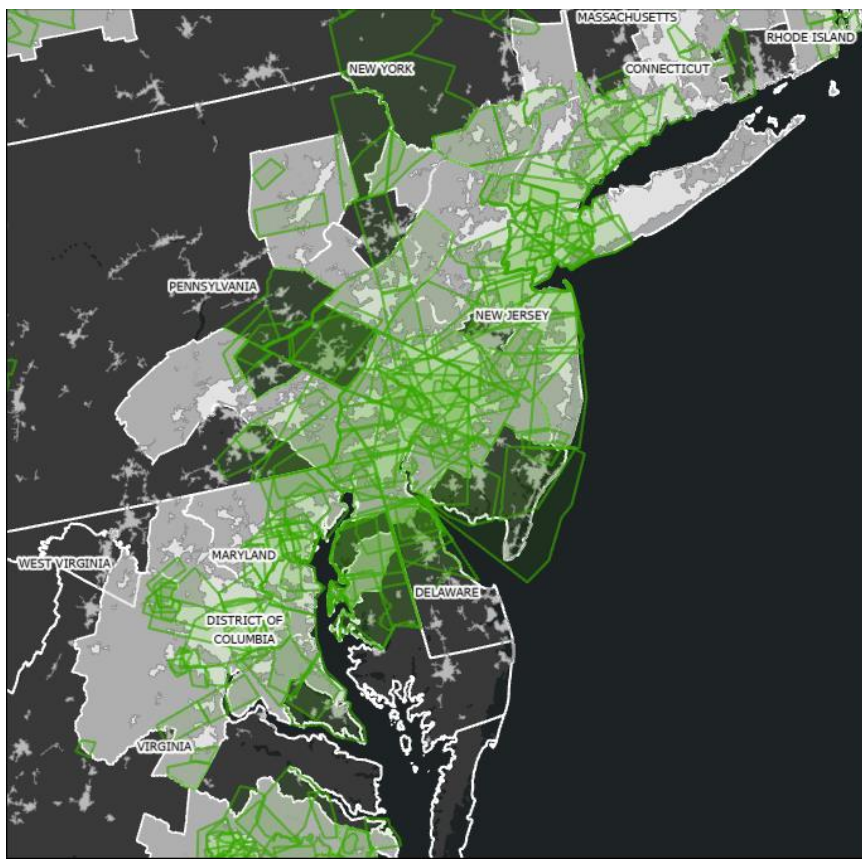
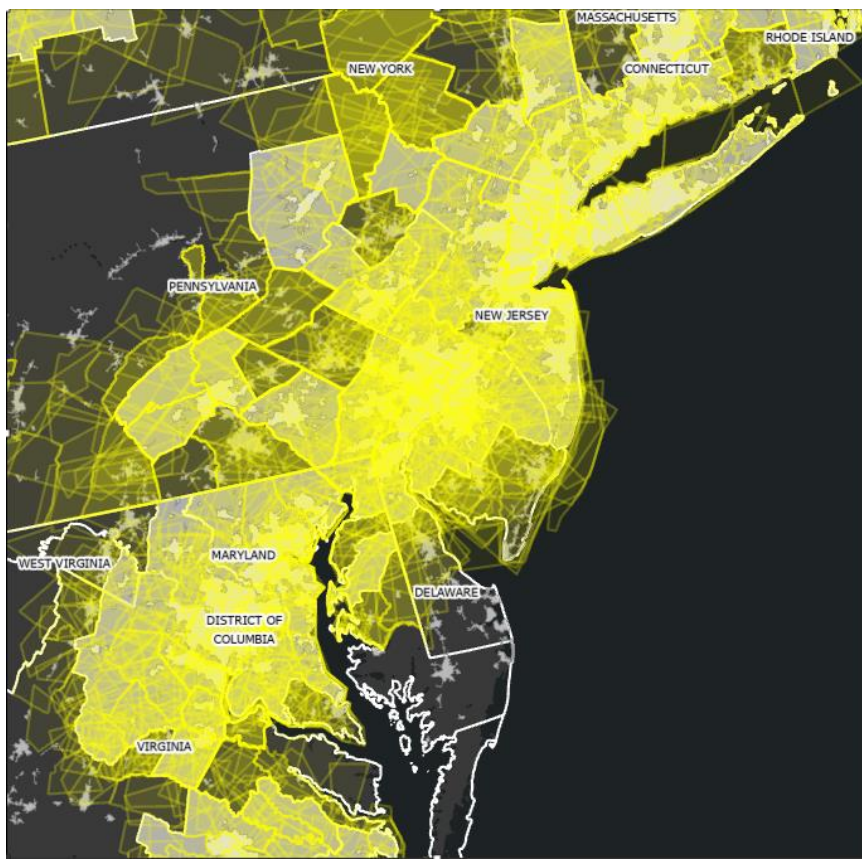
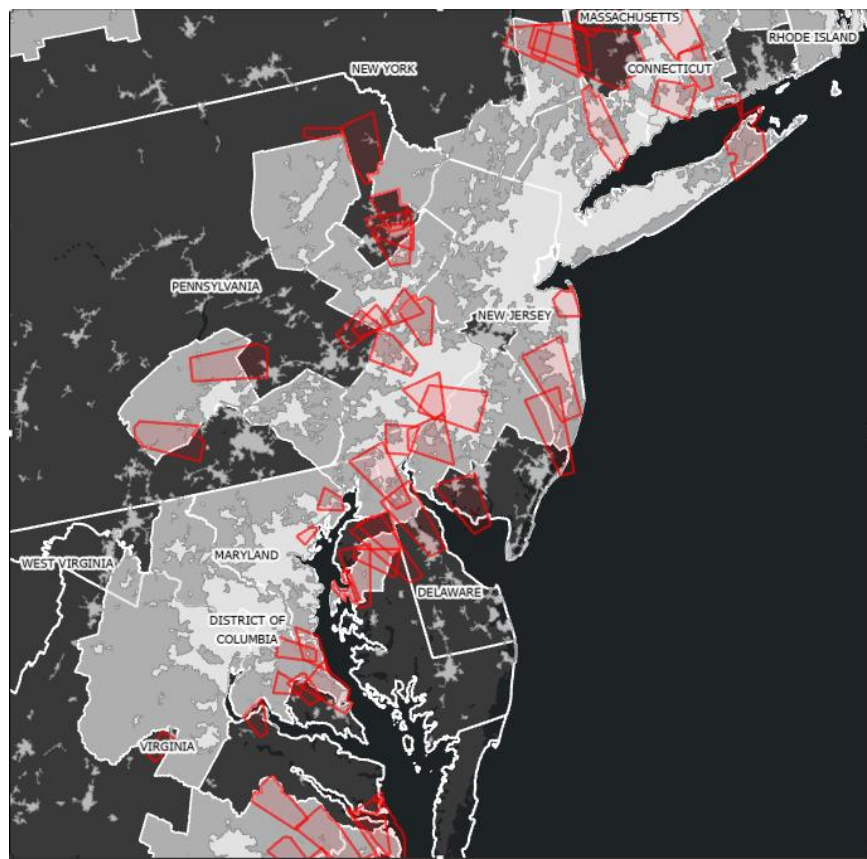
- Goal 1:** Define urban-adjacent high impact weather-related events.
- Goal 2:** Aggregate aircraft observations for use in subsequent analysis.
- Goal 3:** Compare the UBL characteristics across observations and modeled data.

## Next Steps

Early analysis and acquisition of collaborators have expanded the scope of this study. The PI has developed the framework for a more expansive research effort alongside researchers from the University of Texas, the University of Georgia, and the United States Forest Service. In the initial proposal, a focus was on numerical model ability to initialize (or realistically represent current conditions) the urban boundary layer during high impact events. Subsequent methodological shifts will investigate predictive ability as well as comparison of model capability in nearby rural areas. *A National Science Foundation proposal is currently in preparation.* One of the new primary objectives is development of an algorithm to better represent the state of the urban boundary layer based on observations.

## High-impact NWS warnings issued from June – August 2020 in the northeast U.S. urban cluster.

Data provided by NOAA/NWS, US Census, and Iowa Environmental Mesonet.



## NWS-ISSUED WARNINGS

- Tornado
- Severe Thunderstorm
- Excessive Heat
- Flash Flood
- Major Metropolitan Areas
- Urban Areas

## References

- <sup>1</sup>United Nations 2019. *World Urbanization Prospects, The 2018 Revision (ST/ESA/SER.A/420)*. New York.
- <sup>2</sup>Smith, B., and J. Blaes. 2015. Examination of a winter storm using a micro rain radar and AMDAR aircraft soundings. *Journal of Operational Meteorology* 03 (14):156–171.
- <sup>3</sup>Seto, K. C., and J. M. Shepherd. 2009. Global urban land-use trends and climate impacts. *Current Opinion in Environmental Sustainability* 1 (1):89–95.
- <sup>4</sup>Oke, T.R. 1982. The energetic basis of the urban heat island. *Quarterly Journal of the Royal Meteorological Society* 108 (455):1–24.
- <sup>5</sup>Mahmood, R. et al. 2010. Impacts of Land Use/Land Cover Change on Climate and Future Research Priorities. *Bulletin of the American Meteorological Society* 91 (1):37–46.
- <sup>6</sup>Shepherd, J. M. et al. 2013. Urban Climate Archipelagos: A

- New Framework for Urban Impacts on Climate. *Earthzine*.
- <sup>7</sup>Arnfield, A. J. 2003. Two decades of urban climate research: a review of turbulence, exchanges of energy and water, and the urban heat island. *International Journal of Climatology* 23 (1):1–26.

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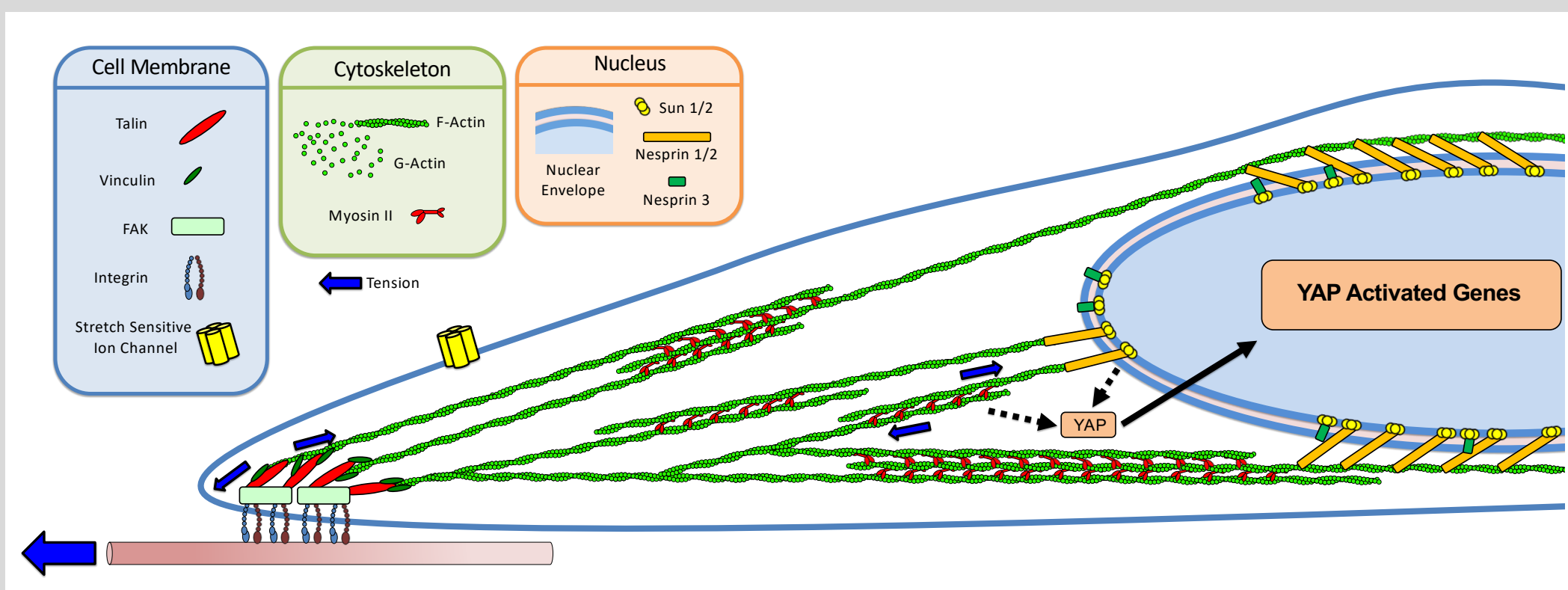
# Molecular Force Sensing at the Nuclear to Cytoskeletal Interface

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## Introduction

- Cells sense and respond to mechanical forces and the stiffness of their environment using specialized mechanosensitive proteins.
- Many of these mechanosensors reside at the cell surface and undergo force sensitive conformational changes that drive cellular signaling [1, 2].
- Recent evidence has also indicated that cytoskeletal connections to the nuclear envelope through nesprins are also involved in the transmission and sensing of mechanical forces and activation of YAP [3-5].
- This work aims to implement fluorescence resonance energy transfer (FRET) based tension sensors to measure molecular forces on proteins of the nuclear envelope and determine their dependence on cytoskeletal contractility and substrate stiffness.



**Figure 1:** Schematic of cytoskeletal force transfer

## Methods

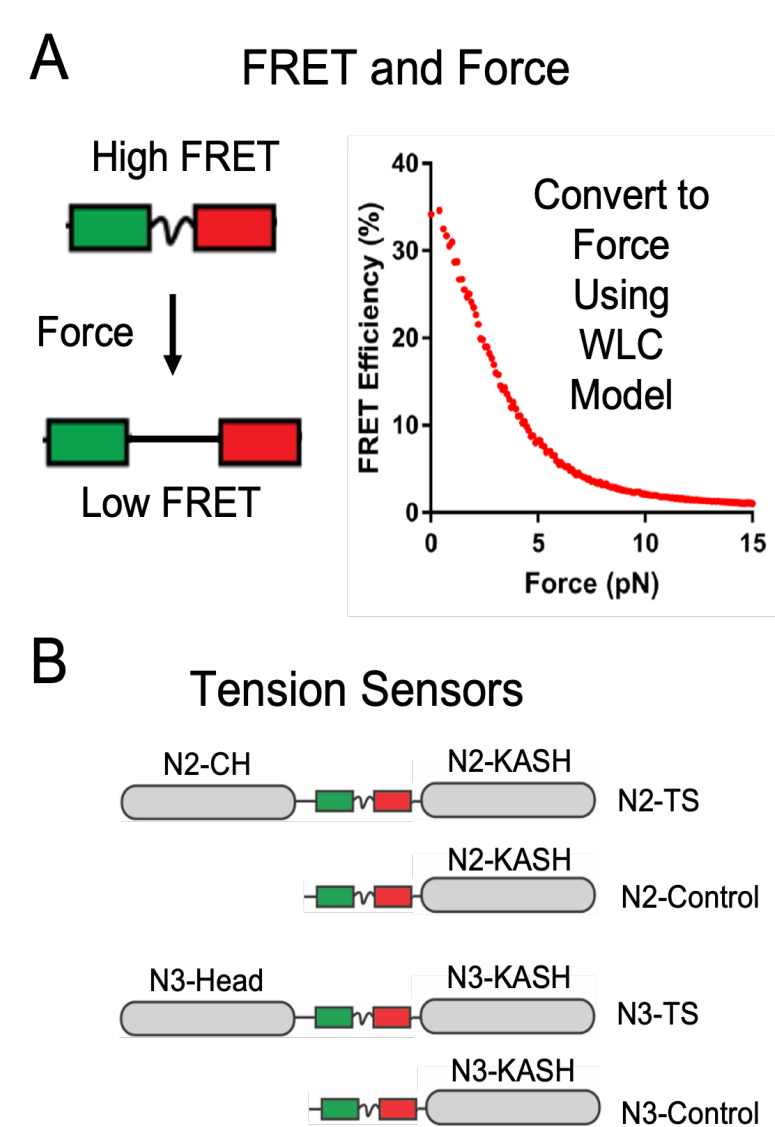
**FRET Based Nesprin Tension Sensor:** The tension sensor module is inserted between the calponin homology domain (CH, actin binding) and the KASH domain (nuclear envelope binding) of nesprin 2 mini [6]. As the module is stretched under force the two fluorescent proteins separate leading to a decrease in FRET. A control sensor that lacks the actin binding CH domain was also used. Ratiometric FRET was calculated from shade and bleed corrected images.

### Perturbations to Force:

Cells were seeded on fibronectin coated glass with or without 50 $\mu$ M blebbistatin to inhibit myosin. For low stiffness experiments, cells were seeded on FN coated 2kPa PDMS.

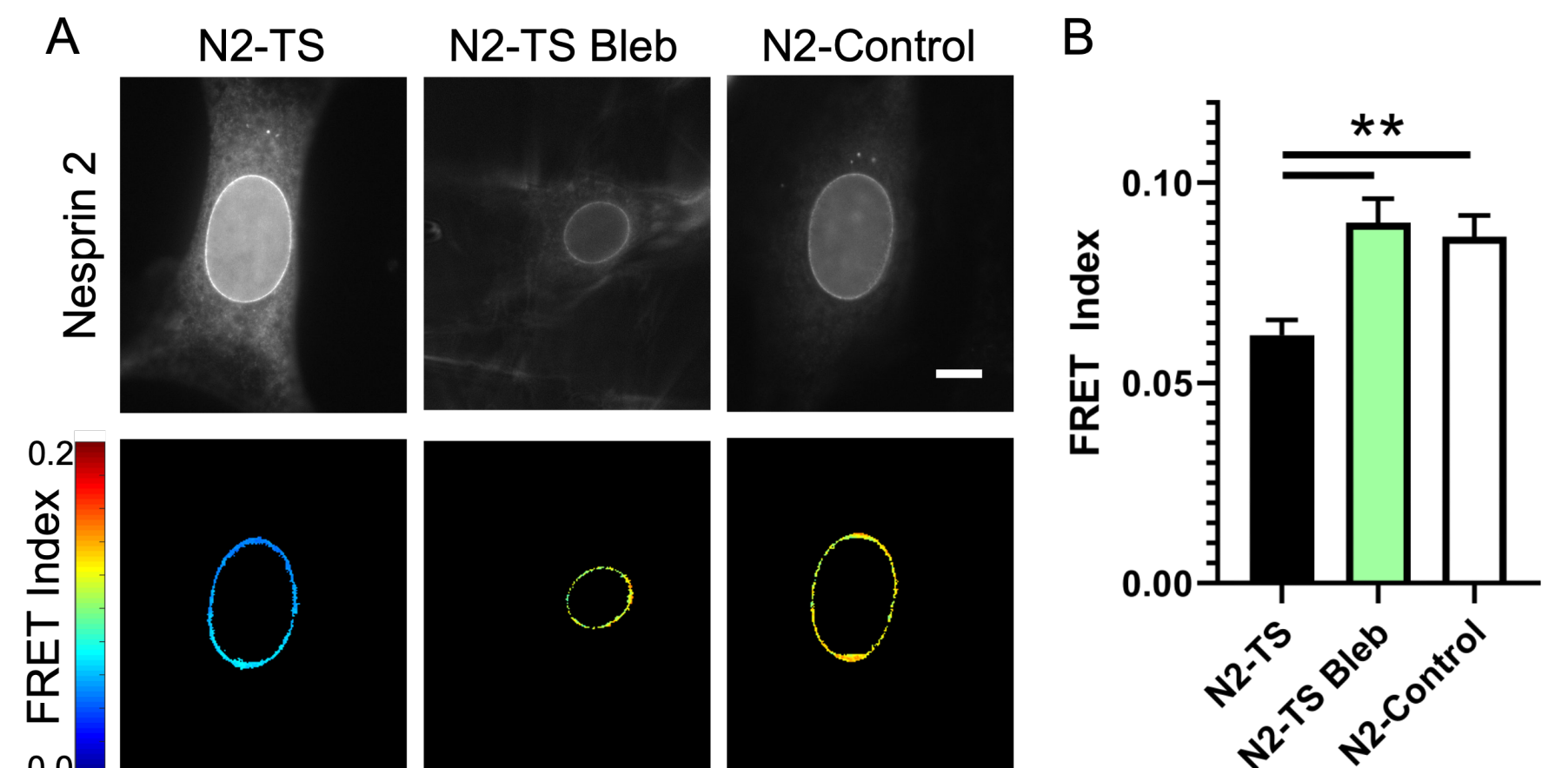
### Nesprin 3 Tension Sensor:

An additional tension sensor using the same tension sensor module inserted into a different nesprin (nesprin 3, Fig. 1B) that does not contain a CH domain, but contains an evolutionarily conserved domain that interacts with intermediate filaments.

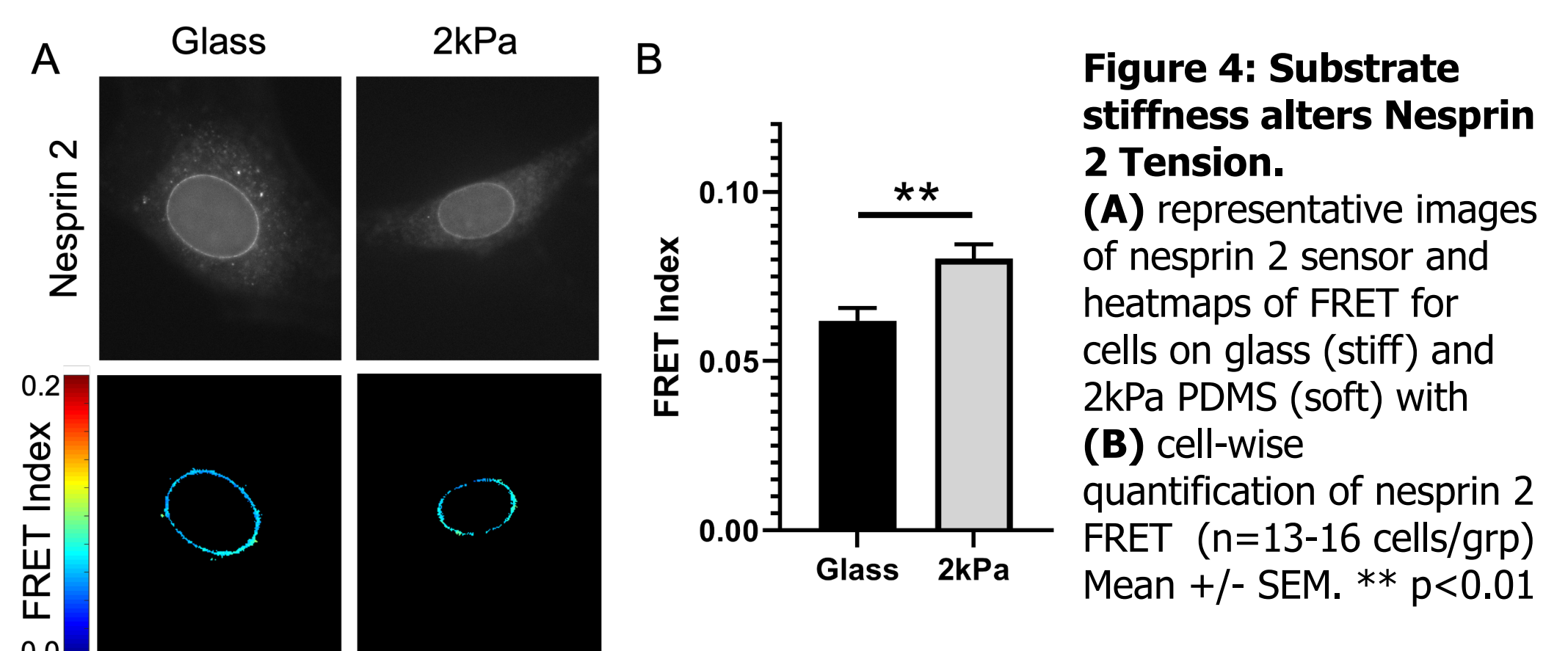


**Figure 2:** (A) FRET tension sensors can be used to measure molecular forces. Increase in force stretches the elastic linker and reduces FRET. (B) Schematic of the Nesprin 2 sensors used here and the Nesprin 3 sensors currently being made.

## Results



**Figure 3: Nesprin 2 is subjected to myosin dependent tension.** Tension sensor measurements for cells spread on fibronectin coated glass with or without the myosin inhibitor blebbistatin (Bleb, 50 $\mu$ M) (A) representative images of nesprin 2 sensors and heatmaps of FRET with (B) cell-wise quantification of nesprin 2 FRET (n=11-16 cells/grp) Mean +/- SEM. \*\* p<0.01, One-way ANOVA with Tukey's post hoc. Scale = 10 $\mu$ m.



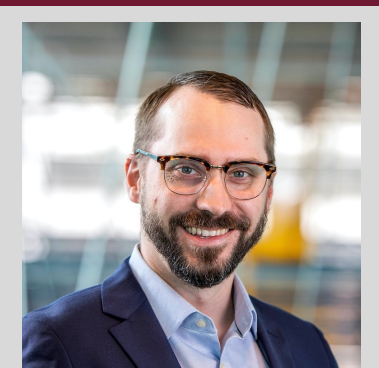
**Figure 4: Substrate stiffness alters Nesprin 2 Tension.** (A) representative images of nesprin 2 sensor and heatmaps of FRET for cells on glass (stiff) and 2kPa PDMS (soft) with (B) cell-wise quantification of nesprin 2 FRET (n=13-16 cells/grp) Mean +/- SEM. \*\* p<0.01

## Discussion

- Nesprin 2 tension sensor data indicates a significant amount of force acting on nesprin 2 in spread cells.
- Force on nesprin 2 was lost with inhibition of myosin using blebbistatin (Fig. 3), consistent with previous work using the MLCK (ML7) and ROCK (Y27632) inhibitors of contractility [6].
- Cells on low stiffness displayed less flattened and spread nuclei (Fig. 4), similar to myosin inhibition.
- Low stiffness reduced the force on nesprin 2, indicating an important role for nesprin 2 in the previously described nuclear deformation regulated stiffness sensing [5].
- Future work will focus on force transfer to other components of the LINC complex that do not have an actin binding domain, and to other non CH domains of nesprin 1 and 2 (Fig. 2).

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## References

- [1] Humphrey+ Nat Rev MCB (2014); [2] Panciera+ Nat Rev MCB (2018) [3] Maurer+ Ann Rev BME (2019); [4] Driscoll+ Biophys J 2015; [5] Elosegui-Artola+ NCB (2017); [6] Conway+ Biophys J 2016



# (Re)considering Participatory Cultures for and with Practicing Teachers



Dr. Emily Plummer Catena, FSU, COE, STE  
Mrs. Kayla Valencia-Rhymer, Gadsden County HS

## Participatory Culture as Framework

“A participatory culture is a culture with relatively low barriers to artistic expression and civic engagement, strong support for creating and sharing one’s creations, and some type of informal membership whereby what is known by the most experienced is passed along to novices. A participatory culture is also one in which members believe their contributions matter, and feel some degree of social connection with one another” (Jenkins et al., 2006, p. 3).

“Educators must work together to ensure that all...have access to the skills and experiences needed to become full participants, can articulate their understanding of how media shapes perceptions, and are socialized into the emerging ethical standards that should shape their practices as media makers and participants in online communities” (Jenkins et al., 2006, pp. 3-4).

## English Education Course “Participatory Culture in Literacy and Learning” as Context

- ❖ Online teacher education master’s-level course
- ❖ Asynchronous environment/format
- ❖ 8 pre- and in-service literacy educators across content areas

## Collaborative Inquiries into our Practices as Educators across Contexts and Roles

- ❖ How do we as educators engage in and with participatory cultures? How do our students?
- ❖ How can we facilitate participatory cultures in our own classrooms? What are the challenges and affordances?
- ❖ What is the role and/or impact of asynchronous contexts and forms of engagement on fostering participatory cultures and on learning?

## Participatory Research Methodologies

- ❖ Course instructor (Plummer Catena) and graduate student/practicing teacher (Valencia-Rhymer) as co-researchers
- ❖ Collaborative analysis of course documents and shared multimodal projects from “Participatory Culture in Literacy and Learning” course
  - ❖ Content analysis (Neuendorf, 2016; Saldaña, 2015)
  - ❖ In vivo coding (Miles, Huberman, & Saldaña, 2014)
    - ❖ Teachers’ own words serve as codes

## Implications for Teacher Educators and Practicing Teachers

- ❖ Facilitating participatory cultures in classrooms necessitates and opens opportunities for “authentic” engagement
- ❖ Educators can work to understand what “authentic” is and involves in their contexts by “**zooming**,” or reflecting **in** and **on** practice **across** contexts
  - ❖ What does “access”—both to technology and to critical engagement in/with it—look like in our teaching and learning contexts?
  - ❖ What forms of professional development do we engage in both in and out of classrooms (our own and others’)?
- ❖ Asynchronous learning contexts and tools offer flexible structures and choices that can support facilitating for and engaging in classroom participatory cultures



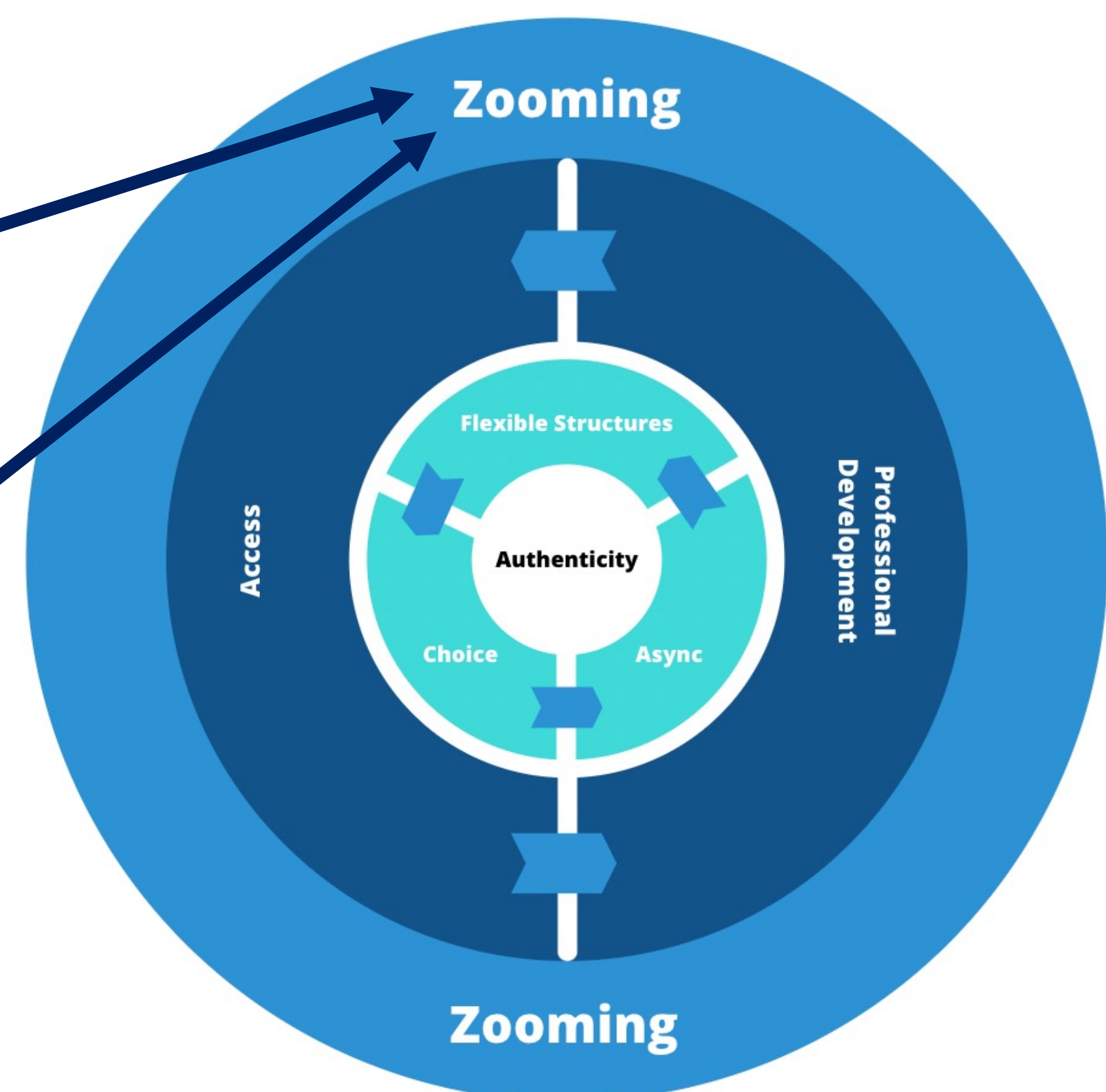
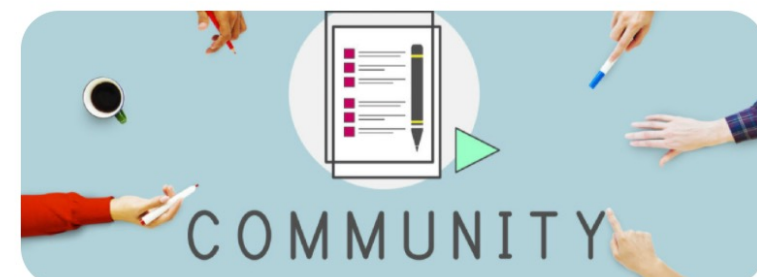
Feb 19, 2021

### Analysis of an Educator Community

14 Responses • 290 views • 30 Comments • 34.6 hours of engagement

Consider whether or not you experience or understand your chosen community to be a participatory culture. Notice aspects of the community like participation patterns, identity constructions, and other representations, and look into how the community positions itself and educators and students. Reflect on what you understand as the meaning-making practices of the community as a whole, using your observations and experiences in it to connect to course readings and your own teaching goals and research interests. What might it mean to be a member of this community? What literacy practices are affiliated with and embedded in members’ participation? Consider your own forms of participation with(in) the community—even if those forms are only in relation to/as a result of this project—and compare them to other communities we have engaged in for our course (NowComment, Flipgrid, Padlet, etc.) and your participation in them as well.

Please also respond to at least two other people's videos.



## Future Directions for Participatory Work

- ❖ More collaborative forms of practitioner inquiry (Cochran-Smith & Lytle, 2009)
- ❖ Professional development that centers “collaborative design” (Voogt et al., 2015) with teachers as “participatory designers” (Coher, et al., 2015)

“opportunities for peer-to-peer learning, a changed attitude toward intellectual property, the diversification of cultural expression, the development of skills valued in the modern workplace, and a more empowered conception of citizenship” (Jenkins et al., 2006, p. 3)