

Tracy Van Holt, PhD

Applied AI Researcher | Systems Evaluator | Spatial, Network & NLP Analysis

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Systems scientist and program leader building AI-enabled data systems that connect fragmented information across environmental, organizational, and supply-chain contexts. Applies human-in-the-loop evaluation to identify model failure modes—including hallucinations and misrepresentations—and iteratively refines outputs for decision-ready insights in complex, real-world systems.

TECHNICAL SKILLS

Methods: Spatial Analysis | Network Analysis | Machine Learning | NLP / LLM Pipelines | Model Evaluation & Validation | Human-in-the-Loop Design

Tools: ArcGIS | Atlas.ti | UCINET | Claude | ChatGPT | RISE 360 / Canvas | Photoshop Suite | Tableau | SPSS

Platforms: Working familiarity with Python, R, and SQL through academic and analytical platforms

PROFESSIONAL EXPERIENCE

Sustainable Systems Lab – Insight Network | *Founder & Director* 2021–Present

- Directed collaborative research and client engagements across an interdisciplinary network of analysts and domain experts; led RFP processes and secured Women-Owned Business Certification
- Evaluated and iteratively refined AI-generated outputs; identified hallucinations and failure modes across supply-chain and analytical workflows
 - Ceylon cinnamon supply chain, Sri Lanka* → Revealed that fragmented information—not production capacity—limits market access; enabled coordination and decision-ready insights
- Conducted cross-actor analysis integrating field, transactional, and stakeholder data across global supply chains
 - 107 seafood supply chains | 50 stakeholder leaders* → Revealed information asymmetry drives coordination failure; informed system design improving pricing power and market access
- Designed AI-assisted curriculum and facilitated stakeholder decision processes on spatial analytics
 - ASU | 5 modules | 20 skills | 4 datasets* → Demonstrated non-experts can evaluate spatial outputs with structured frameworks; expanded interactive access

NYU Stern School of Business – Center for Sustainable Business | *Director of Academic Research | Research Associate Professor* 2017–2021

- Led and directed a cross-functional research team across ESG analytics, supply chain, and sustainability data programs; mentored researchers and oversaw analytical quality across projects serving Fortune 500 clients
- Evaluated and validated ESG outputs; identified inconsistencies and alignment gaps across multinational supply chains
 - Mars, McDonald's, Big-Box Retail, Automotive Industry* → Revealed sustainability-driven supply chain organization generates measurable financial returns; enabled integration into core business decisions
- Operationalized workforce resilience metrics within AI-assisted ESG datasets using the Quality Jobs framework
 - Russell 1000 firms | 10 indicators: security, viability, equity, flexibility* → Revealed labor conditions materially shape firm performance and resilience to financial shocks—expanding measurement beyond traditional metrics
- Designed cultural consensus studies comparing shared beliefs with operational decisions
 - ~50 questions per study | GlobeScan collaboration* → Revealed misalignment between stated values and actual practices; identified structural constraints on innovation and value creation

Stockholm Resilience Centre & Swedish Royal Academy of Sciences | *Marine Theme Leader & Senior Scholar* | 2014–2017

- Led the Marine Theme research program; directed interdisciplinary teams and coordinated across ~20 collaborators spanning ecology, governance, and social science
- Assessed and refined model outputs across governance and production datasets; identified systematic gaps in actor participation.

107 global Fishery Improvement Projects (FIPs) → Revealed that governance strength and supply-chain connectivity—not isolated interventions—drive long-term sustainable outcomes

- Built multi-layer behavioral networks linking fishers, species, and environmental systems

106 fishers | 311 species | 11 communities | 17 management areas → Revealed cross-scale interactions between land, ocean, and human behavior shaping fisheries outcomes at national scale

East Carolina University | *Assistant Professor*

2010–2014

- Developed and validated machine learning classifications; diagnosed model limitations in remote sensing and land system representations

~200 km local scale | ~1,200 km regional scale → Revealed that misclassifying tree plantations as native forest systematically distorts environmental models and propagates errors downstream

- Applied cultural consensus and expert-effect models to survey and field data

Subsistence hunter communities, Amazon basin → Distinguished shared vs. expert knowledge; identified how availability heuristic may bias expert interpretation and decision-making

Office of Naval Research – MURI Program | *Research Scientist / Postdoctoral Scholar*

2009–2010

- Designed and refined NLP/LLM pipelines; benchmarked human-coded, automated, and semi-automated text classification approaches

Human Relation Area Files Data → Semi-automated methods achieved ~88% precision vs. ~38% automated—demonstrating the precision gap and importance of human-in-the-loop design

- Sudan conflict dataset | 2003–2010 | 7 years | 42 ethnic groups Integrated environmental, socio-political, and geocoded data into meta-network models

→ Revealed access to environmental resources predicts conflict intensity more strongly than ethnic identity alone

RESEARCH IMPACT

31 peer-reviewed publications | ~3,000 citations | h-index 19 | ~50% first-author | ~50 co-authors

Lead PI on ~\$1M in competitive grants: NSF RAPID (\$98K) | RWJ Foundation (\$150K) | Prudential (\$150K) | Swedish Research Council FORMAS (\$400K) | NASA Fellowship (\$74K)

EDUCATION

Ph.D. & M.S., Interdisciplinary Ecology — University of Florida

2009

Marianne Schmink Award for Outstanding Interdisciplinary Dissertation | Fulbright Scholar | NASA Fellow | David Boren Fellow (DoD) | Rotary Scholar | Coca-Cola Scholar | Tinker Fellow | Explorer's Club Scholar | Brookhaven Women in Science Fellow

B.S., Biochemistry — SUNY Stony Brook

LANGUAGES & GLOBAL REACH

Languages: Fluent in Spanish | Conversational Portuguese and Swedish | Working knowledge of Mapudugun and Guarayo indigenous languages

Field Research: Chile | Brazil | Bolivia | Indonesia | Madagascar | Sweden | United States

Off-Site Research: Rwanda | Sri Lanka | Sudan and South Sudan