

# Robert L. Miller, Ph.D. P.E.: Overview

## • Background

- 2015: PhD Applied & Computational Mathematics (Mathematical Biology)
- 2006 – 2017: Senior engineer C.H. Fenstermaker & Associates
- Current: Assistant professor, CIVE Dept.

## • Applications

- 0D/1D/2D hydrodynamic and hydrologic (H&H) modeling
- Salinity & water temperature modeling on system-wide scale
- Coastal restoration/numerical modeling

## • Field Work

- Water quality - fresh & brackish waters
- Flood-induced hypoxia, water temperature

## • Mathematical Biology

- Analysis of nonlinear population dynamic models using finite difference methods

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### River Research and Applications

RESEARCH ARTICLE | [Open Access](#) |

Modeling response of water temperature to channelization in a coastal river network

Robert L. Miller

First published: 09 December 2020 | <https://doi.org/10.1002/rra.3756> | Citations: 1

Funding information: University of Louisiana at Lafayette, Grant/Award Number: (2020-23)-RD-A-25

INTL. J. RIVER BASIN MANAGEMENT  
<https://doi.org/10.1080/15715124.2021.1961795>



RESEARCH PAPER



Forcing uncertainty and salinity response to dredging in a tidal freshwater river

Robert L. Miller

Watershed Flood Center and Department of Civil Engineering, University of Louisiana at Lafayette, Lafayette, LA, USA

Calcolo (2021) 58:29  
<https://doi.org/10.1007/s10092-021-00420-x>

Advances in Pure and Applied Mathematics  
2021, vol. 12, n° special, 71-95 pages, DOI: 10.21494/ISTE.OP.2021.0609

ISTE OpenScience

Second-order finite difference approximation for a nonlinear size-structured population model with an indefinite growth rate coupled with the environment

Azmy S. Ackleh<sup>1</sup> · Robert L. Miller<sup>2\*</sup>

A Multi-Region Nonlinear Size-Structured Population Model with Coagulation and Vertical Effects

Un modèle de population multirégional et non linéaire structuré par la taille avec coagulation et effets verticaux

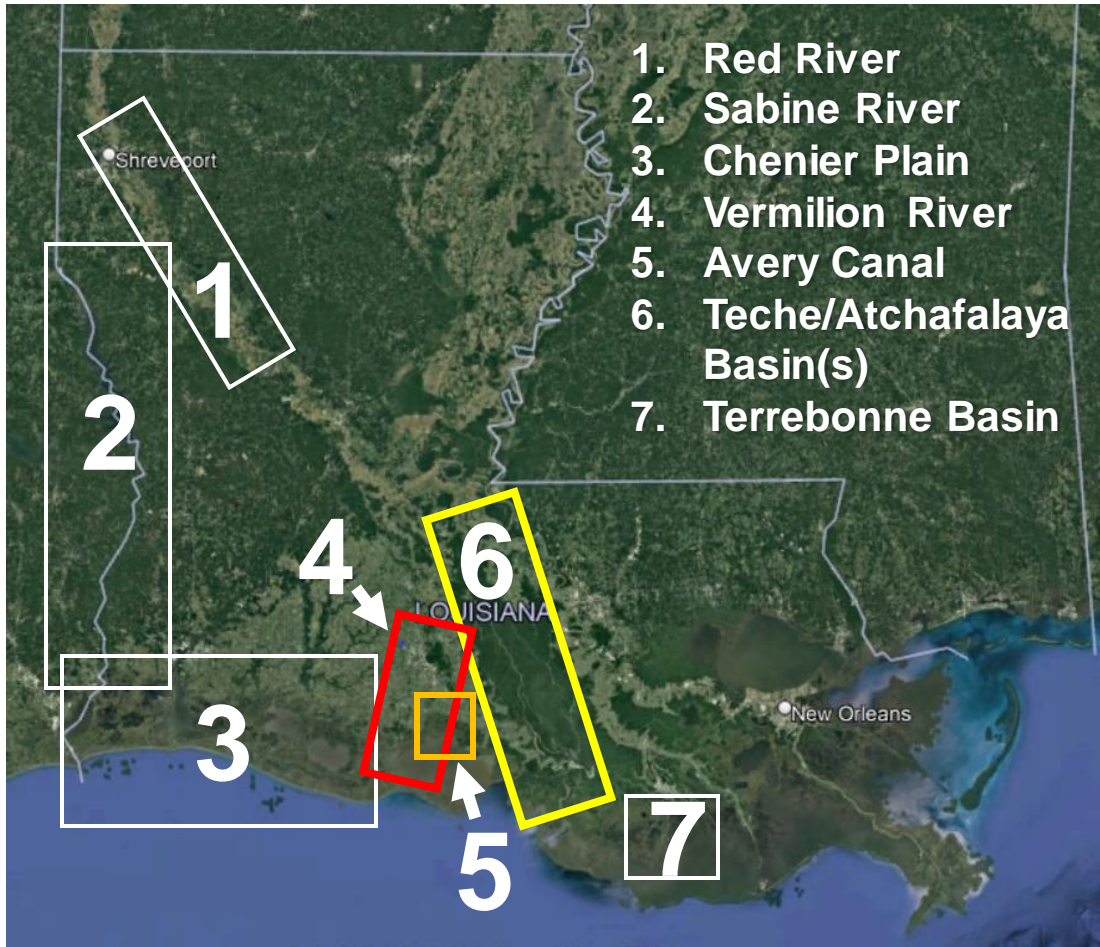
Azmy S. Ackleh<sup>1</sup> and Robert L. Miller<sup>2\*</sup>



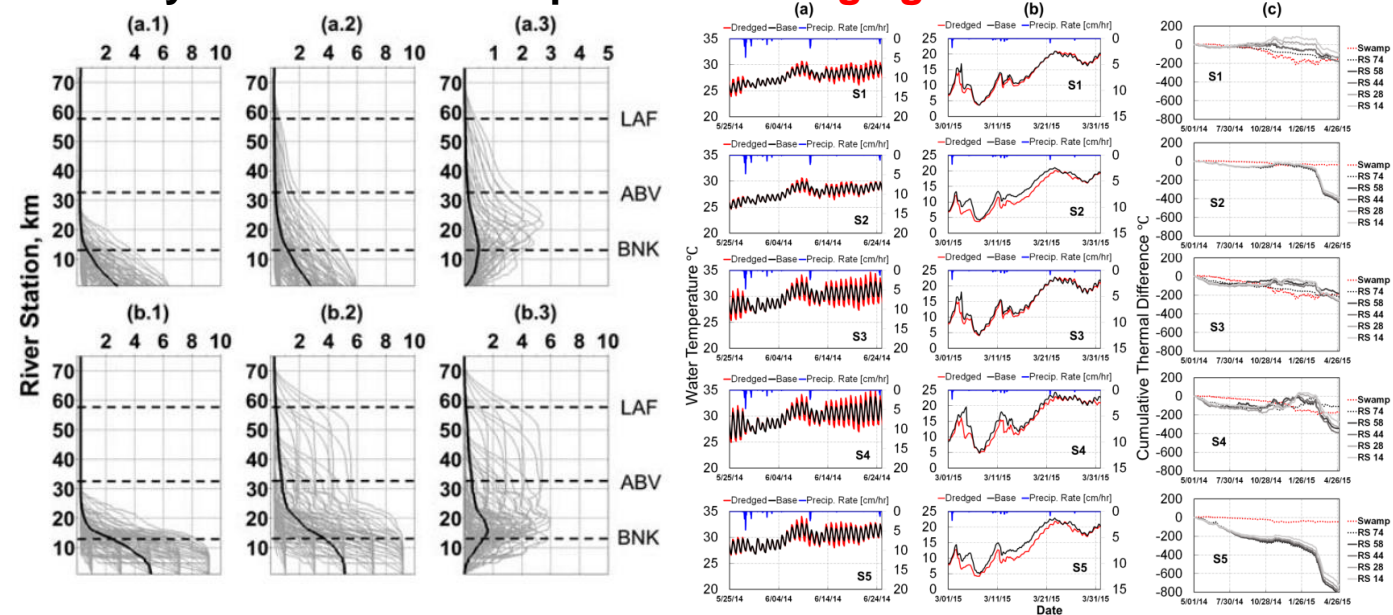
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**Louisiana Watershed  
Flood Center**

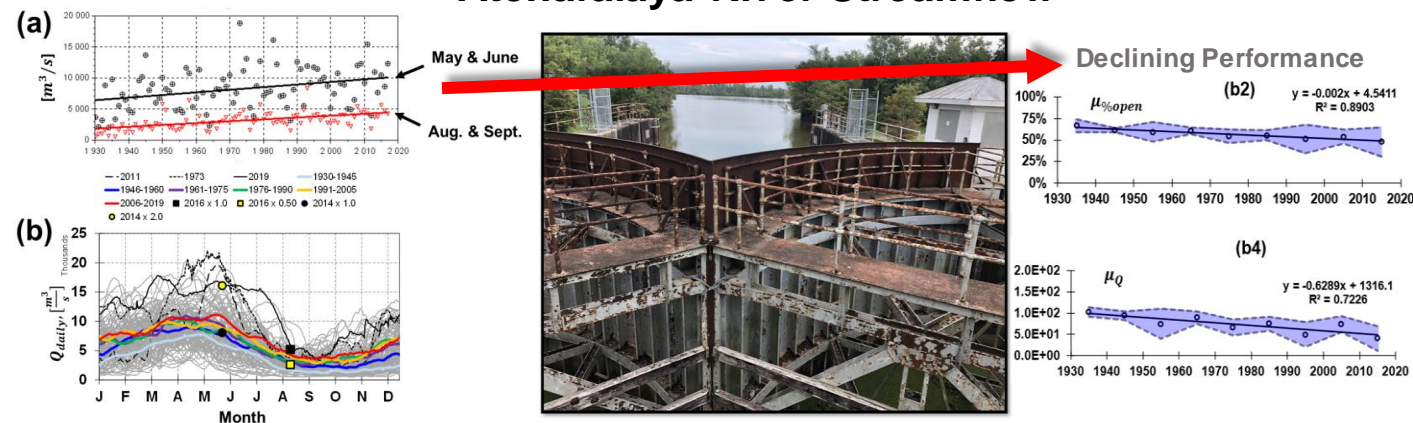
# Completed and Ongoing Studies



## Salinity and Thermal Response to Dredging the Vermilion River



## Flood Control Structure Response to Nonstationary Atchafalaya River Streamflow



# Multidisciplinary Themes

1. Socioecological **benefits and impacts of flood control intensification**
2. **Cumulative impacts of flood regulation (e.g. Atchafalaya Floodway) and climate change effects** on water quality and fish population dynamics
3. Flood mitigation affects on **invasive species distribution and persistence in coastal zone**
4. **Urban stream syndrome effects** in rural LA waterways and wetlands
5. **Micro/mesocosm/field studies** to help parametrize effects of hydrology and water quality in vital rate sub-models

