

# Challenges and Opportunities of Integrated Flood Management in the Post-COVID19 Era

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## 2 | COVID 19



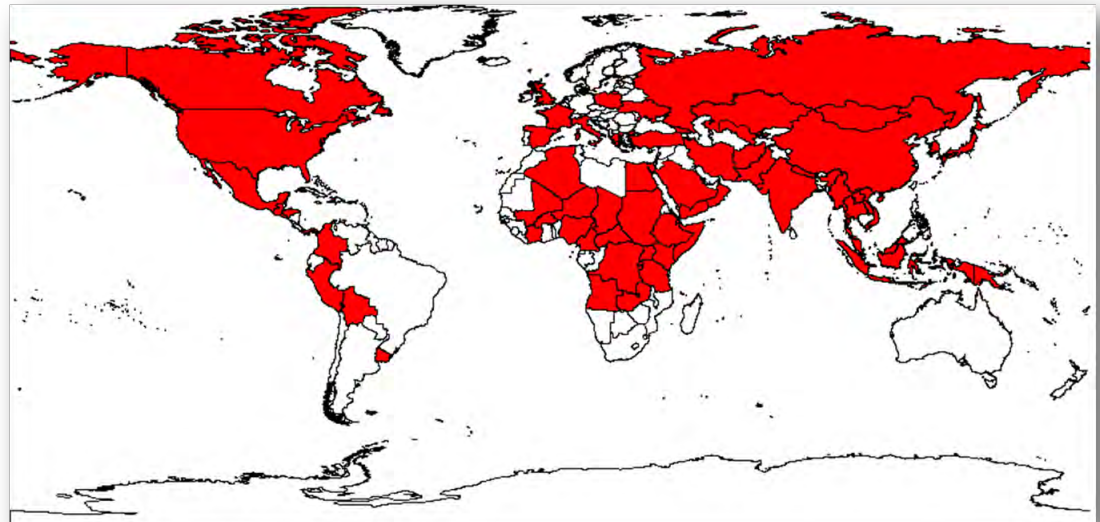
- Disruption in communications
- Cancelling live events
- Reflection and change



# 3 | COVID 19 and flooding



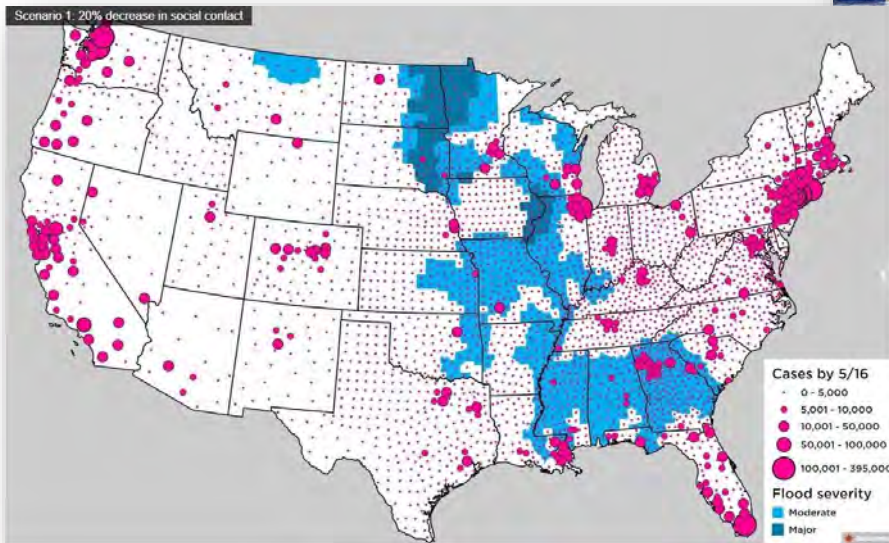
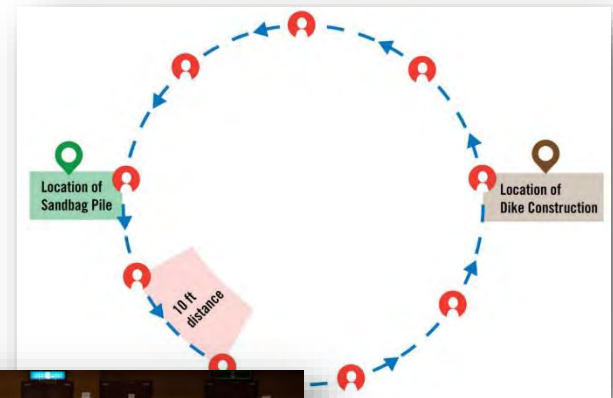
- Natural disasters
  - 2021 record damages USD \$320 billions
  - 2022 not far USD \$270 billions
- Floods are the costliest
  - Pakistan floods
  - 1700 lives
  - 33 millions displaced
  - 1/3 of the country inundated
  - USD \$15 billion damage



# 4 | COVID 19 and flooding



- Immediate actions
  - Manitoba activity guide
  - Japan issues in housing displaced people
  - US mapping combined risk of COVID and flooding
  - ...





# 5 | COVID 19 and flooding Challenges

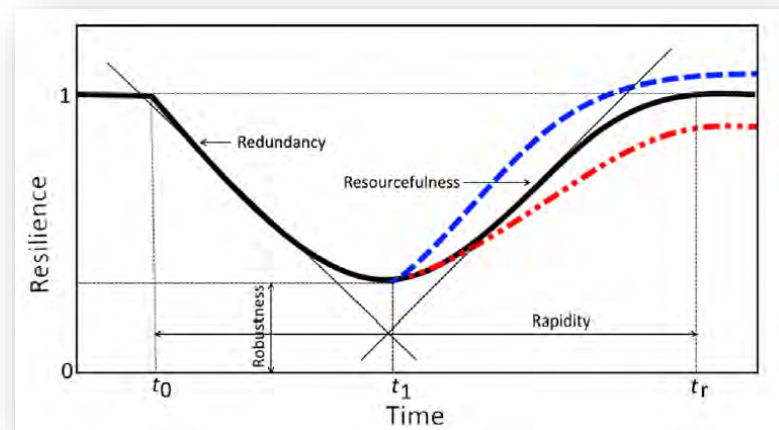
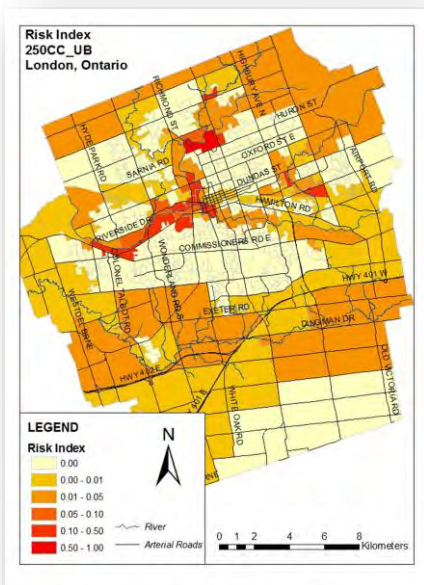


- Compounding
  - COVID and flooding
  - Floods and droughts (California)
  - Floods and fire



# 6 | COVID 19 and flooding Challenges

- From risk to resilience
  - Broader concept
  - Dynamic concept
  - Concept able to capture direct and indirect losses



# 7 | COVID 19 and flooding Challenges

- Storage
  - Spatial and temporal transformation
  - Natural – wetlands
  - Constructed – dams and reservoirs





# 8 |

## COVID 19 and flooding Challenges



- Strategic retreat
  - Gilbert White – relocation among key “adjustments” for reducing the risk of flooding
  - General definition - “the purposeful, coordinated, movement of people and assets out of harm’s way”
  - Complex challenges - legal, logistical, ethical, political, financial, and architectural
  - From MANAGING UNAVOIDABLE TO AVOID UNMANAGEABLE





# 9 | COVID 19 and flooding Challenges

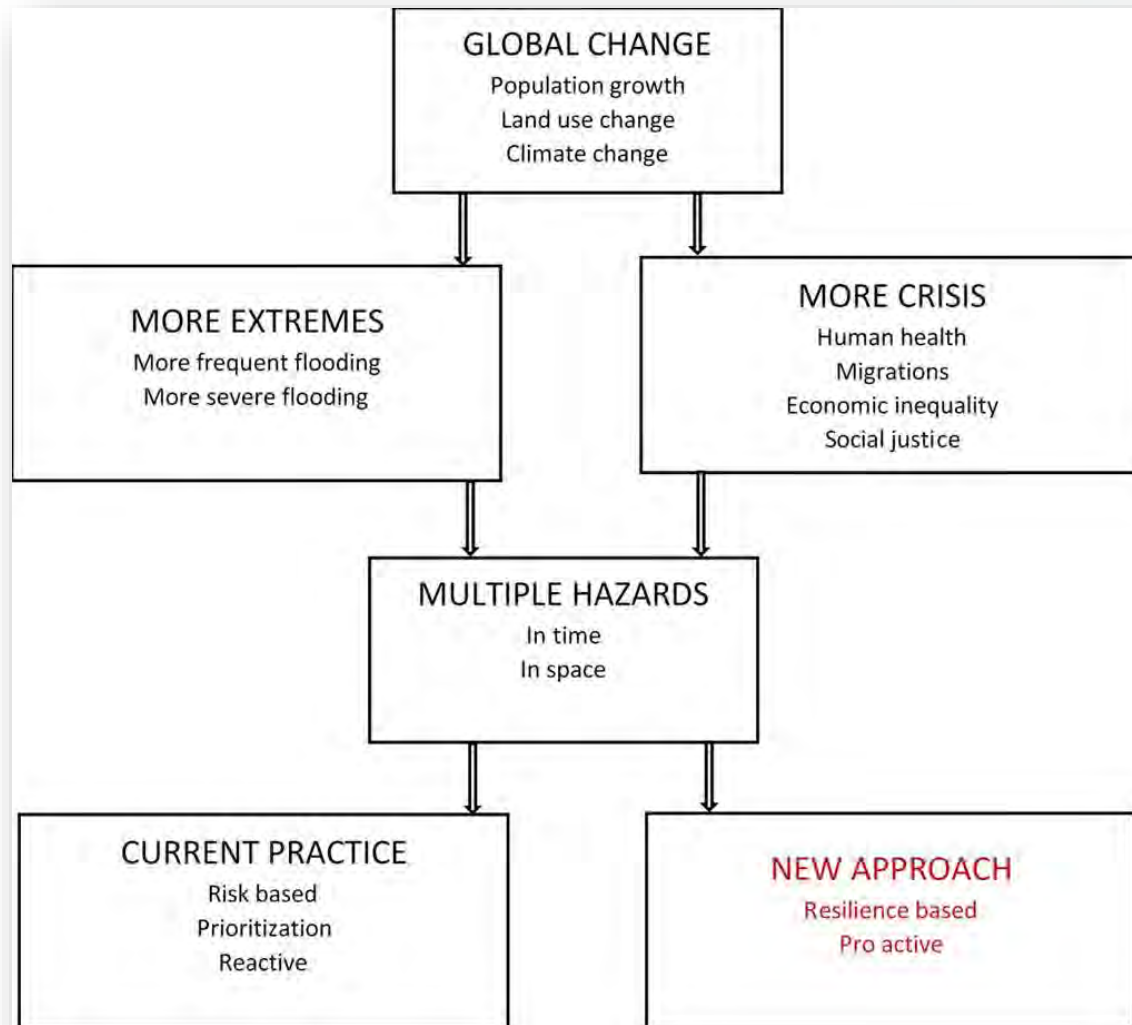


- Equality
  - Access to resources, information and decision-making processes
  - Inclusivity

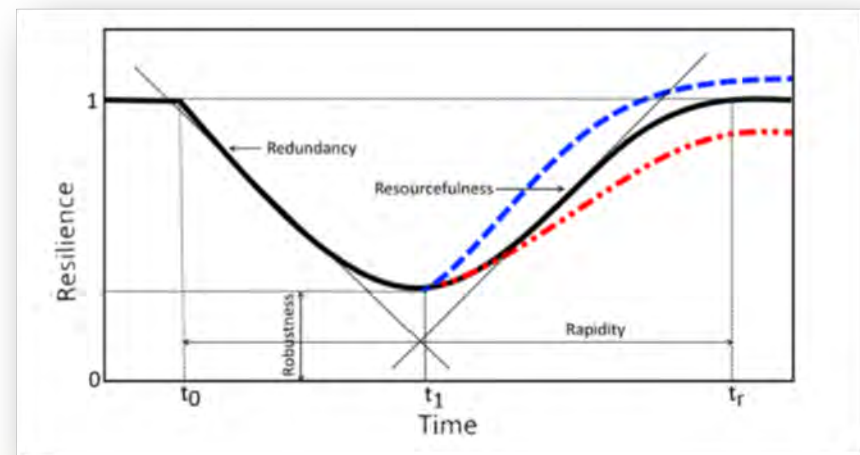
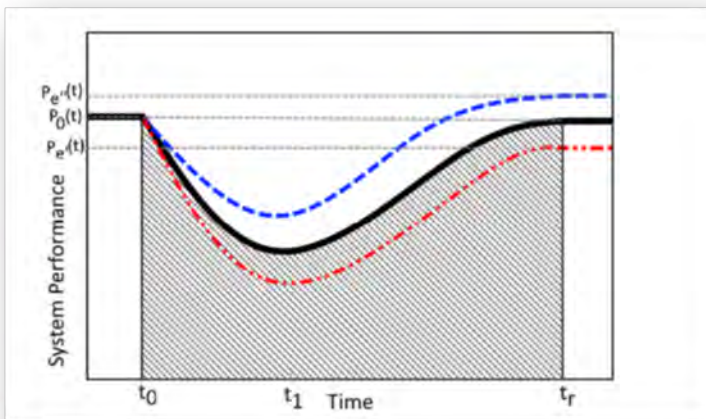
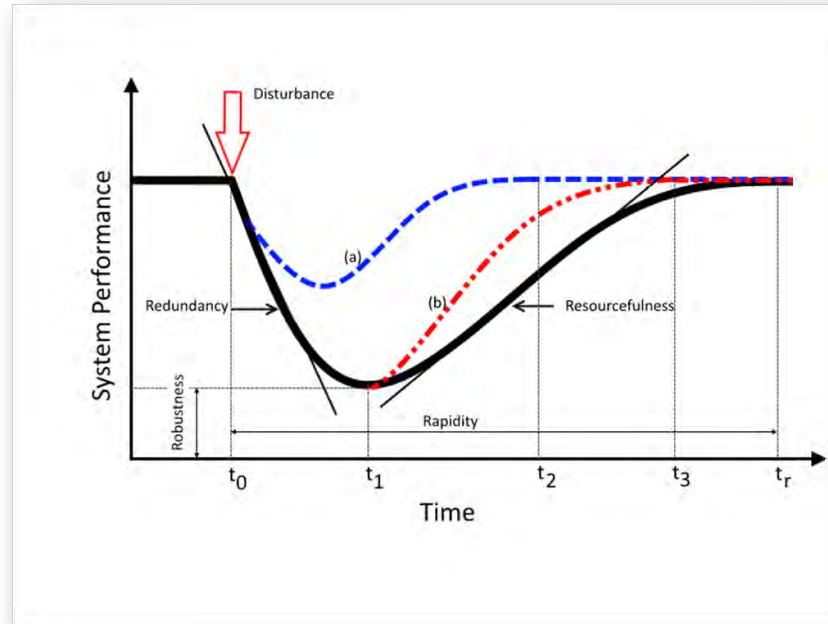


# 10 | INTEGRATED FLOOD MANAGEMENT

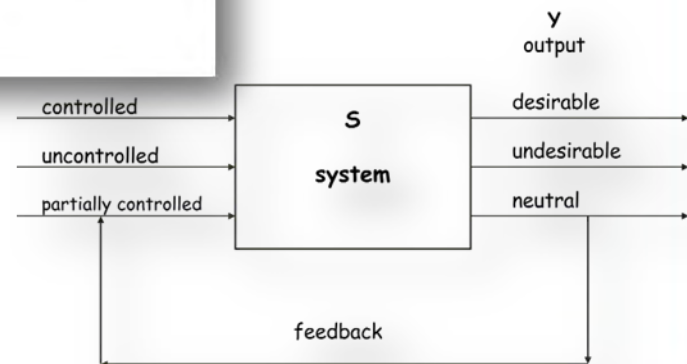
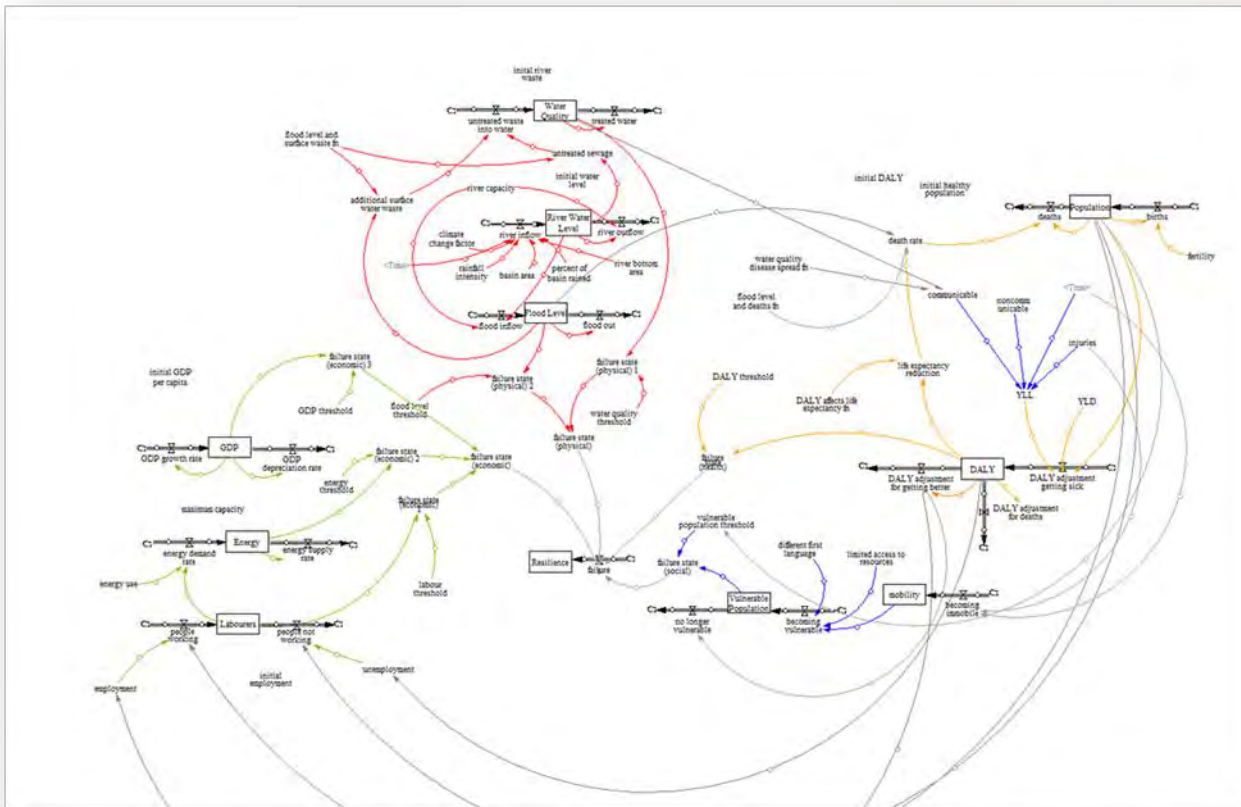
Opportunities



# 11 | INTEGRATED FLOOD MANAGEMENT Opportunities



# 12 | INTEGRATED FLOOD MANAGEMENT Opportunities

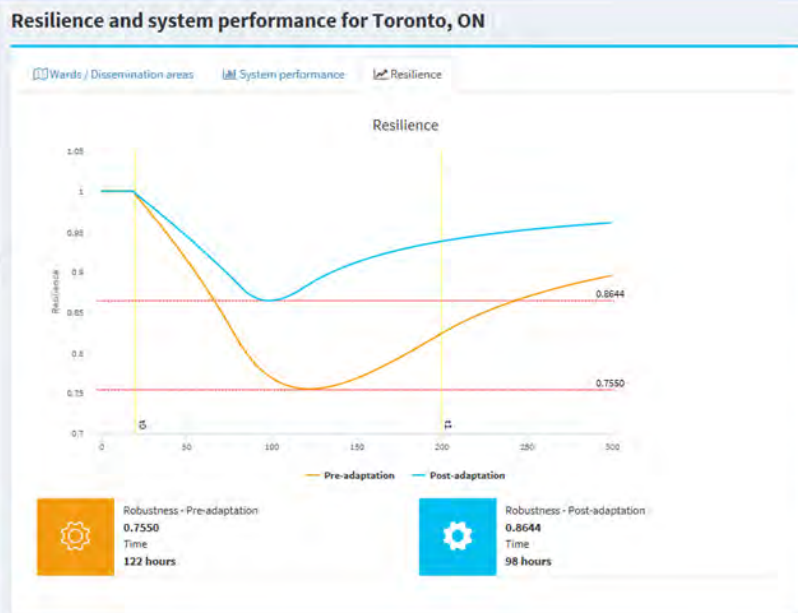




# 13 | INTEGRATED FLOOD MANAGEMENT Opportunities



- City of Toronto
- MAIN NAVIGATION
- About the tool
- Data sources and download
- GIS maps
- Adaptation options
- System performance measures
- Analysis
  - System performance
  - Resilience
- Documentation



### Adaptation options

Proactive | Reactive

**Temporary diking measures**

- Buildings protected (%): 89
- Roads Protected (%): 87

**Pumping out of flooded area**

- Reduced flood extent (%): 10

**Evacuation and relocation**

- Vulnerable people protected (no.): 37,462

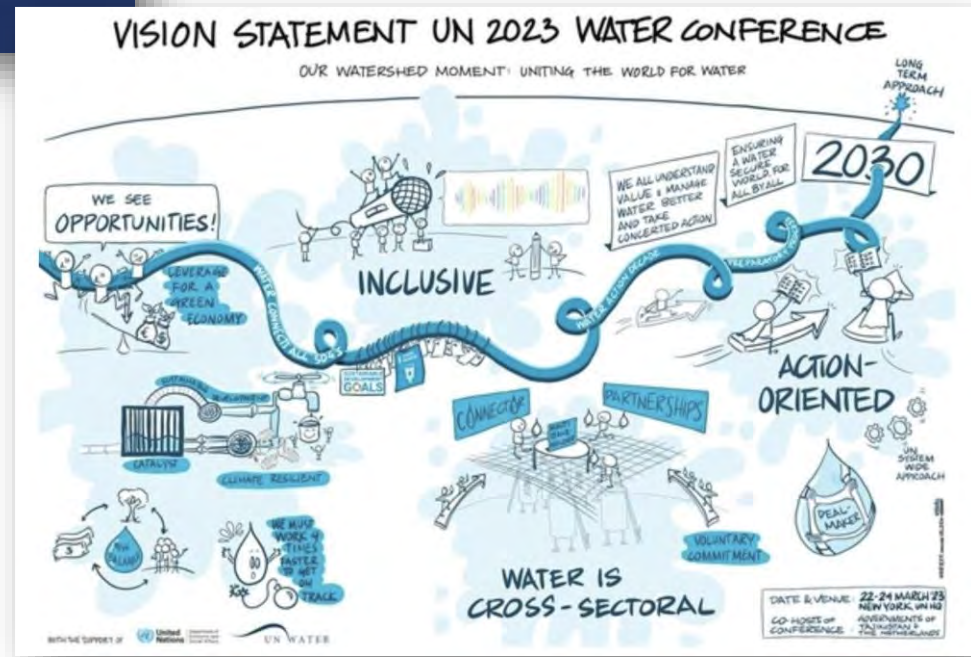
**Allocation of resources**

- Monetary: 97
- Technological and material: 93
- Human resources: 100

**Response time**

- Measure implementation time (hours): 4

# 14 | CLOSING STATEMENTS



# 15 | RESOURCES



Simonovic, S.P., Z.W. Kundzewicz, and N. Wright (2021) “Floods and the COVID-19 pandemic—A new double hazard problem”. *WIREs Water*. e1509, open access, <https://doi.org/10.1002/wat2.1509>

Simonovic, S.P. (2020) “Systems Approach to Management of Water Resources – Toward Performance Based Water Resources Engineering”, *Water*, Special Issue Application of the Systems Approach to the Management of Complex Water Systems, 12, 1208; doi: 10.3390/w12041208, open access, <https://www.mdpi.com/2073-4441/12/4/1208/pdf> (***Editor’s Choice recognition***).

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# 16 | Slobodan P. Simonović

Research facility



- Computer-based research laboratory
- Research:
  - *Subject Matter* - Systems modeling; Risk and reliability; Water resources and environmental systems analysis; Computer-based decision support systems development.
  - *Topical Area* - Reservoirs; Flood control; Hydropower energy; Operational hydrology; Climatic Change; Integrated water resources management.
- 77 research projects
- Completed: 12 visiting fellows, 22 PosDoc, 24 PhD and 45 MSc

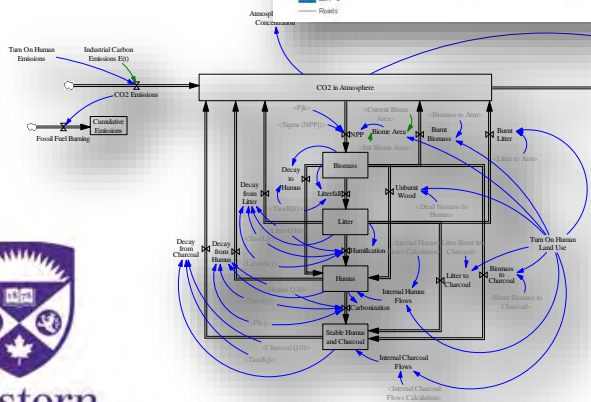
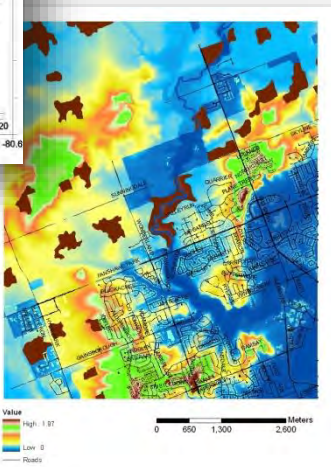
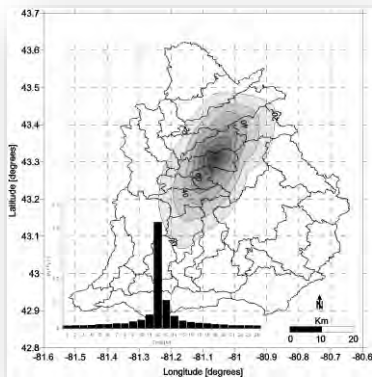




# 17 | Slobodan P. Simonović

Current research projects

- Water Resources Management Capacity Building in the Context of Global Change





# 18 | Slobodan P. Simonović

## Research results

- ~ 610 professional publications
- 267 in peer reviewed journals
- 3 major textbooks
- Water Resources Research Reports 117 volumes – <https://ir.lib.uwo.ca/wrrr/>
- > 113,060 downloads since 2011

