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Decision Support for Recovery Operations after Landslides

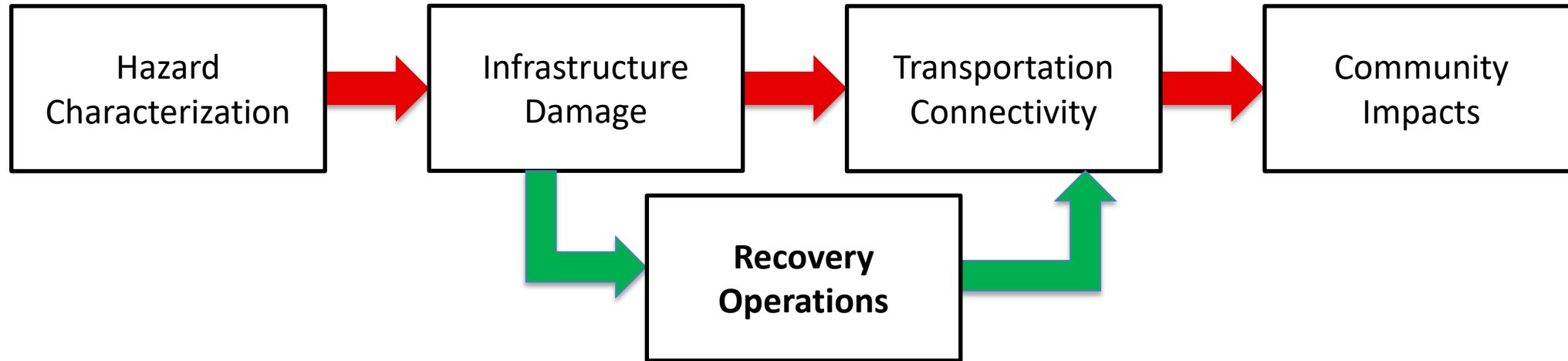
Joseph Louis & Chonnapat Opanasopit

3/7/2025

Research Overview



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How can recovery operations be quantified?

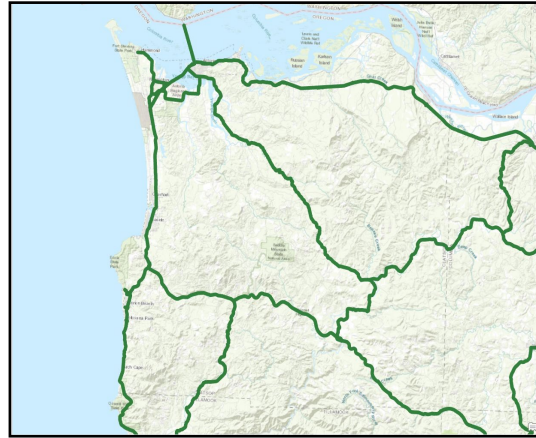
What are our community's equipment needs?

Which communities are particularly at risk of islanding due to lack of resources?

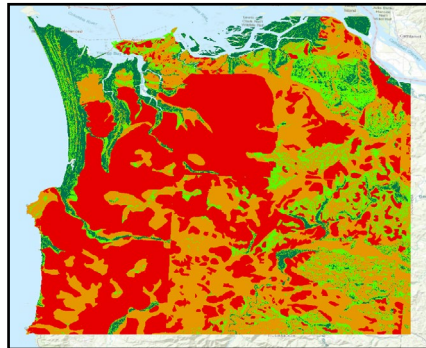
How can we improve community readiness to respond to disasters?

Highway Susceptibility to Landslides in Clatsop County

Highway network (ODOT)

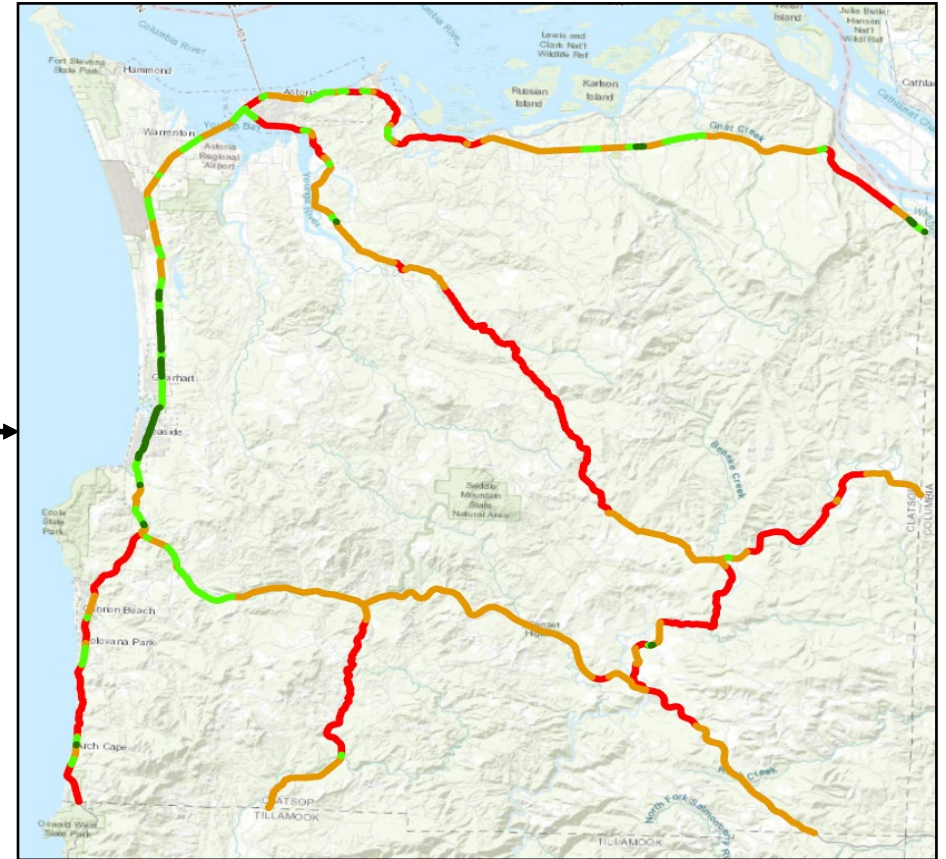


Statewide Landslide Information Database for Oregon (SLIDO)



Description	
Low	Green
Moderate	Yellow
High	Orange
Very High	Red

ODOT SPR 808 & 843 – Landslide Susceptibility Maps



Susceptibility of Highways

Debris Clearance Operations



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Q&D CONSTRUCTION

est. 1964

Landslide along 400ft of SR208 in Nevada closes road for 2 months in 2023

Processing Rocks
for Transport



Debris Removal and
Disposal



Slope
Stabilization



Resurfacing
Roads



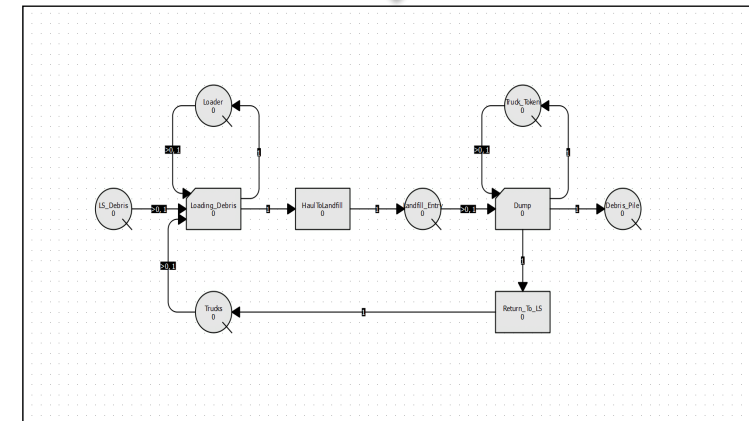
Modeling Recovery Operations and Resource Requirements

Obtain information about operations:

- ODOT Emergency Operations Manual
- Contractor interviews
- Prior landslide clearance projects

Model operations using Discrete Event Simulation

- Considers resource requirements for activities
- Enables identification of bottlenecks
- Integrating with GIS to automatically extract road lengths and travel times

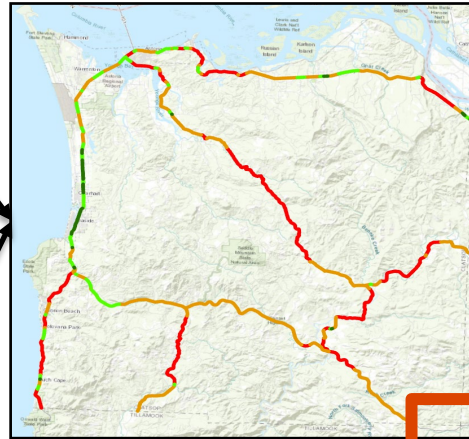


DES model for simulating landslide debris clearance

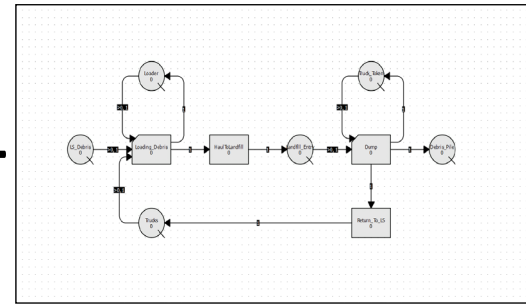
What next?



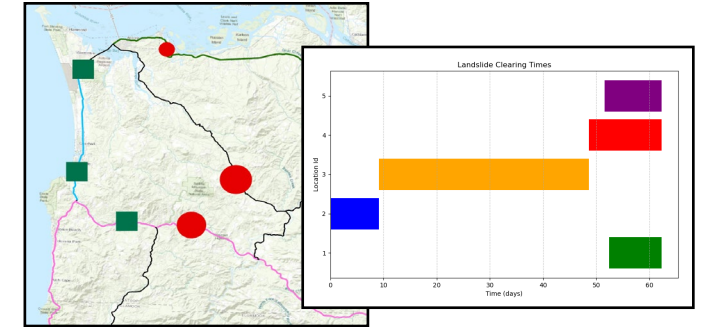
GIS maps of roadways and hazard susceptibility



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Recovery times based on equipment availability, hazard, and connectivity

Integrate CRESCENT outputs, other Hazard Models

Decision Support for CSZ-impacted communities. Opportunity for Workforce Development for Heavy Equipment Operators

Analyze time taken for recovery based on resource allocation

- We are integrating operations planning into the pipeline of hazard analysis
- Where should be pre-positioning resources to improve readiness after considering: Hazard, Connectivity, and Demographics
- How long will it take to repair roads based on equipment availability and positioning?
- Which areas need more equipment?



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Thank you!

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