RAMDO SOLUTIONS

CASE STUDY: MOBILITY

Reliability-Based Stochastic Mobility Maps

This case study shows how RAMDO software, when used in conjunction with computer simulations, provides improved mobility mapping.

For efficient mission planning of troop movement, the Department of Defense needs reliable mobility maps. These maps are important for decision makers to plan routes and operations, select capable vehicles, and assess mission success or failure. The stakes are high, as mission failure often means potential loss of life.

CHALLENGES

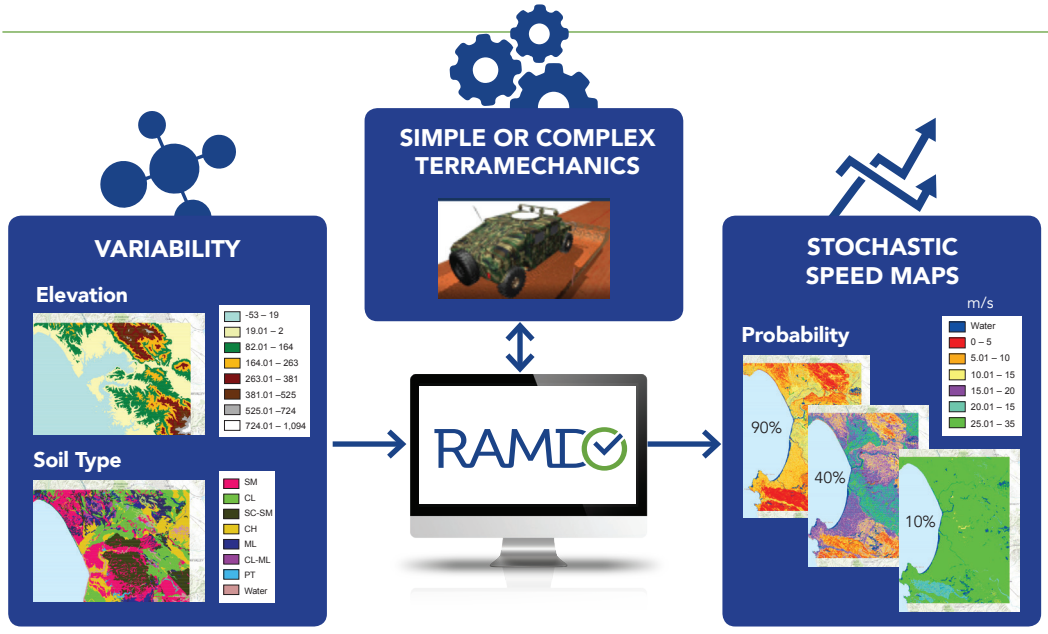
One of the biggest reasons traditional mapping is not reliable is because it does not account for the variability of terrain such as slope, elevation, soil properties, etc. The Department of Defense knew their current method of predicting the speed at which they could travel would not be accurate without addressing this variability. Sometimes their data would indicate a route was possible, when in fact, they would get stuck. And on the flip side, it might show a route as impenetrable, when actually, it was a viable option.

OBJECTIVE

Reliably predict the speed at which the Department of Defense can traverse their vehicles across a given terrain using simulations together with soil and elevation information.

METHOD

RAMDO works in conjunction with the simulation model, allowing engineers to input parameter variabilities. Then it builds a surrogate model to approximate the simulation model, which is much more computationally efficient to run. From this, RAMDO is able to produce an output distribution of results.



Mobility Method Example

RAMDO worked in conjunction with a terramechanics simulation. The variation accounted for was of the input parameters of soil type, slope, and elevation. The resulting output distribution was a series of predictive speed maps at any chosen probability level.

Reliability-Based Stochastic Mobility Maps

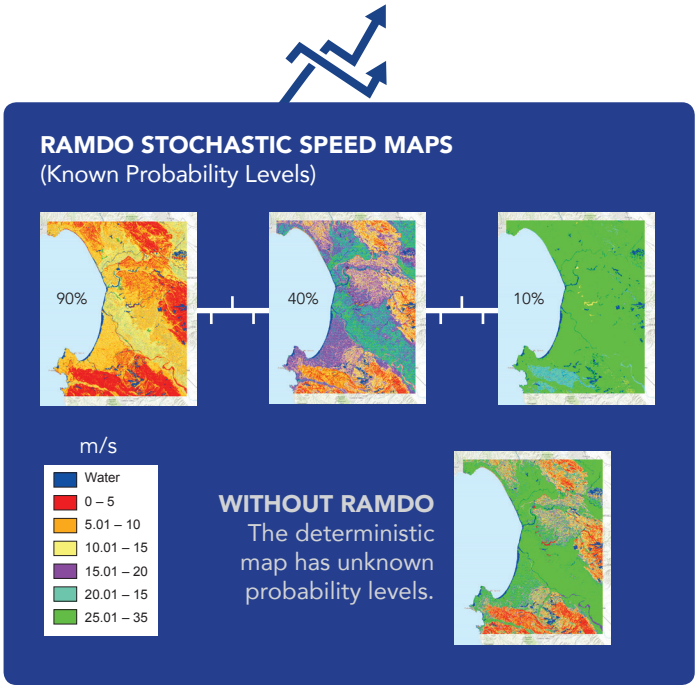
CASE STUDY: MOBILITY

RESULTS

RAMDO accurately shows the predicted speeds obtainable at any given probability level. Results are more accurate because of the inclusion of the variation in inputs.

Without RAMDO, probability levels were unknown and likely inaccurate speeds because the simulation did not take into account the variability of inputs.

In this example, RAMDO was able to account for the variability inputs (soil type, slope, elevation) and produce predictive speed maps at any selected probability level. Contrastingly, the deterministic map (without considering the input variations), produced a single map of unknown probability levels and likely inaccurate speed predictions.

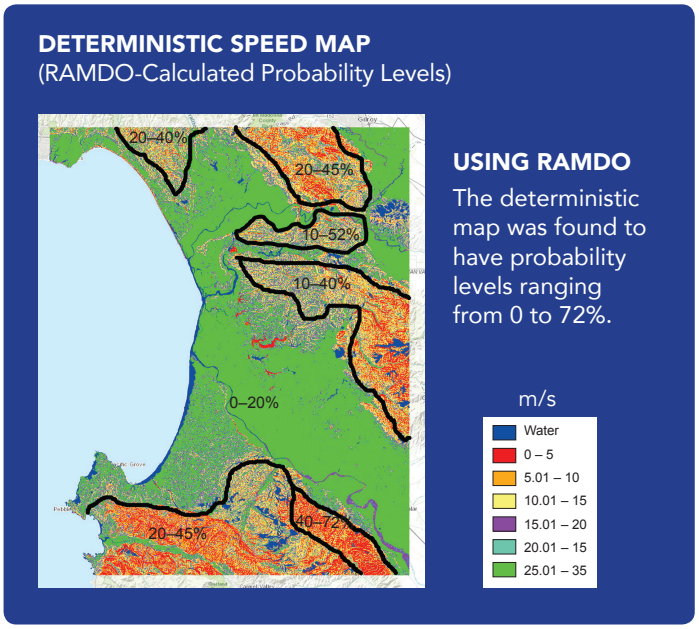


ADVANTAGE

Deterministic maps without RAMDO show inaccurate obtainable speeds at unknown probability levels. With RAMDO, results are both accurate and reliable.

SUMMARY

With the ability to better predict speed and success of military travel, missions will be safer, more cost effective, and reliable.



RAMDO SOLUTIONS

136 S. Dubuque St., Iowa City, IA 52240-4009
www.ramdosolutions.com
info@ramdosolutions.com
319-359-6501