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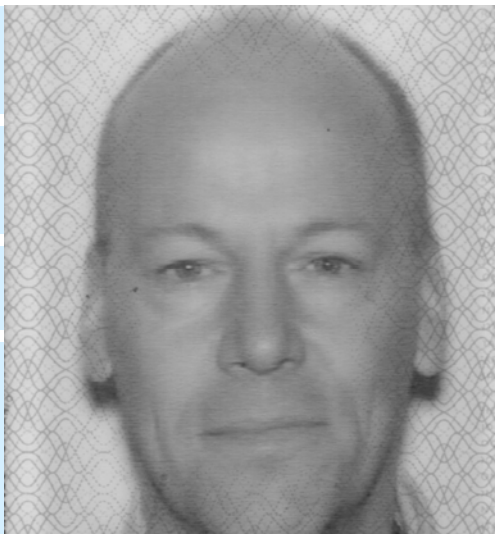
ROLES:	MSc. Systems Science Candidate University of Ottawa
DISCIPLINES:	Systems Analysis, Natural Resource Modelling, Simulation, Optimization
KEYWORDS:	adaptive management strategies, decision support, geographic information systems, spatial data modelling, wildfire management



RESEARCH INTERESTS:

There is growing recognition of the importance of preserving Canada's boreal ecosystem. Canada's boreal forest covers 58.5 percent of the country with approximately 584 million square kilometers stretching from Yukon Territory to Newfoundland. Ecosystems and communities across Canada have been subject to trends of increasing risks caused by endogenous and exogenous hazards. These trends are notable in increased frequency and severity of natural and man-made disasters and extreme weather patterns.

Wildfires are a natural part of the lifecycle in ecosystems. However, in recent years, climate research indicates an increase in the frequency and severity of wildfires, often posing real threats for local communities. In British Columbia, 2003 and 2009 were record years, involving frequent evacuation orders and causing extensive property damage. As a result, wildfire management strategies require continuous improvement to accommodate converging challenges and shifting trends.

This research focuses on adaptive management strategies in support of wildfire risk mitigation decisions in the Nechako Lakes District in central British Columbia, Canada, by using 1. Spatial Analysis using ArcGIS to quantify spatial correlations and probability distributions of wildfires based on historic data from the Canadian National Fire Database along with topographical and land use data, and 2. Scenario simulations and optimizations to assess impacts and opportunity cost of various adaptive management strategies for wildfire risk mitigation.

Various wildfire management methods are considered in this study, including but not limited to:

Controlling human access to certain areas during high hazard times.
Creating natural fire breaks to increase chance of future fire containment.
Prescribed burning.
Preventive logging.
Changing harvesting regimes for trees and vegetation.
Using herbivores for fuel management.
Enhancing biodiversity.
Improving forest health.

Results of this research serve to increase our understanding of historic data and to strengthen existing wildfire management strategies and decision support models to mitigate wildfire risks.

BIOGRAPHY:

Harry Kessels combines thorough knowledge of Computer Systems and Consultancy skills with a broad International Project Management and Business Consulting experience. Over the past 25 years, he has worked in International Development Cooperation, Enterprise Resource Planning, Finance & Controlling and Information & Communication Technology projects in over 20 countries. He has an MSc-degree (1990) in Agricultural and Environmental Science from Wageningen University in The Netherlands, and is currently pursuing an MSc-degree in Systems Science at the University of Ottawa in Canada, under the supervision of Professor Daniel Lane and Adjunct Professor Richard Moll. His research interests include natural resource modelling, simulation and optimization.