Problem Chosen	2024 MCM/ICM Summary Sheet	Team Control Number
A		2411262

Rapid Bushfire Response for Emergency Response

Summary

How to respond and deal with fires in time when they occur is a question worth thinking about. This paper provides a fire response plan for Victoria through the ratio- nal deployment of EOC, drones and forward teams.

In Task 1, the paper establishes the area safety evaluation model with fire frequency, size, andrecentfiresituationasindicators toclassify thedanger levels of different areas in Victoria. Then, we confirm that drones should provide different services for high- risk and dangerous areas. In order to increase the service capacity, we optimize both capacity and cost. For capability, we make the average response time of SSA drones to high-risk areas as short as possible, and reserve as many SSA drones to dangerous areas as possible. For cost, we quantify the demand for SSA drones in terms of fire acreage, and take into account the rounds and the attrition rate of drones. We also consider the mix between SSA drones and radio repeater drones, and calculate the number of repeater drones using a greedy mix-based maximum number solving algo- rithm. The total cost is calculated and finally the quantity optimization model based on the maximum mix rate and minimum cost is obtained. **200 SSA drones and 32 radio repeater drones are needed, respectively.**

Keywords: safety factor commensurable signal-to-noise ratio

Contents

1 Introduction

1.1 Problem Background

PROBLEM BACKGROUND

1.2 Restatement of the Problem

RESTATEMENT

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ONE FIGURE AND SOME DISCRIPTION.

2 Assumptions and Notations

2.1 Assumptions

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2.2 Notations

NOTATIONS

3 Model I: XXXXXX

PRE-DISCRIPTION OF THE MODEL. SOME FIGURES AS WELL.

3.1 Factors/Development of the model

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3.1.1 More Sub-details I

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3.1.2 More Sub-details II

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3.2 Factors/Development of the model

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3.3 Factors/Development of the model

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4 Model II: XXXXXX

PRE-DISCRIPTION OF THE MODEL. SOME FIGURES AS WELL.

4.1 Factors/Development of the model

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4.1.1 More Sub-details I

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4.1.2 More Sub-details II

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4.2 Factors/Development of the model

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4.3 Factors/Development of the model

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5 Application of Models

CHOOSE CERTAIN REGION TO UTILIZE THE MODELS ABOVE.

6 Sensitivity Analysis

NECESSARY SENSITIVITY ANALYSIS HERE.

7 Model Evaluation and Further Discussion

7.1 Strengths

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8 Newspaper Artical/Flyer/Magazine

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References

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Appendices

Appendix A First appendix

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