



UAVs in Disaster Response

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UAVs in Disaster Response

Introduction

Why use UAVs

Different types of UAV

Data transport and
analysis

Barriers to adoption

Matthew Lloyd

ASW Observer:

Manage the use of sensors and other control other ships and aircraft to locate, track and attack Soviet Submarines (a bit like aggressive Air Traffic Control)

Aircraft captain, but not the pilot, the pilot drives the aircraft and the observer drives the pilot

Picture is of my first SAR mission



I do have *some* piloting skills



I was a
UAV Pilot

For missile targets!



Benefits of UAVs in Disaster Response

Rapid data acquisition

Low risk (pilots want to live!)

Minimal ground facilities (airfield not required)

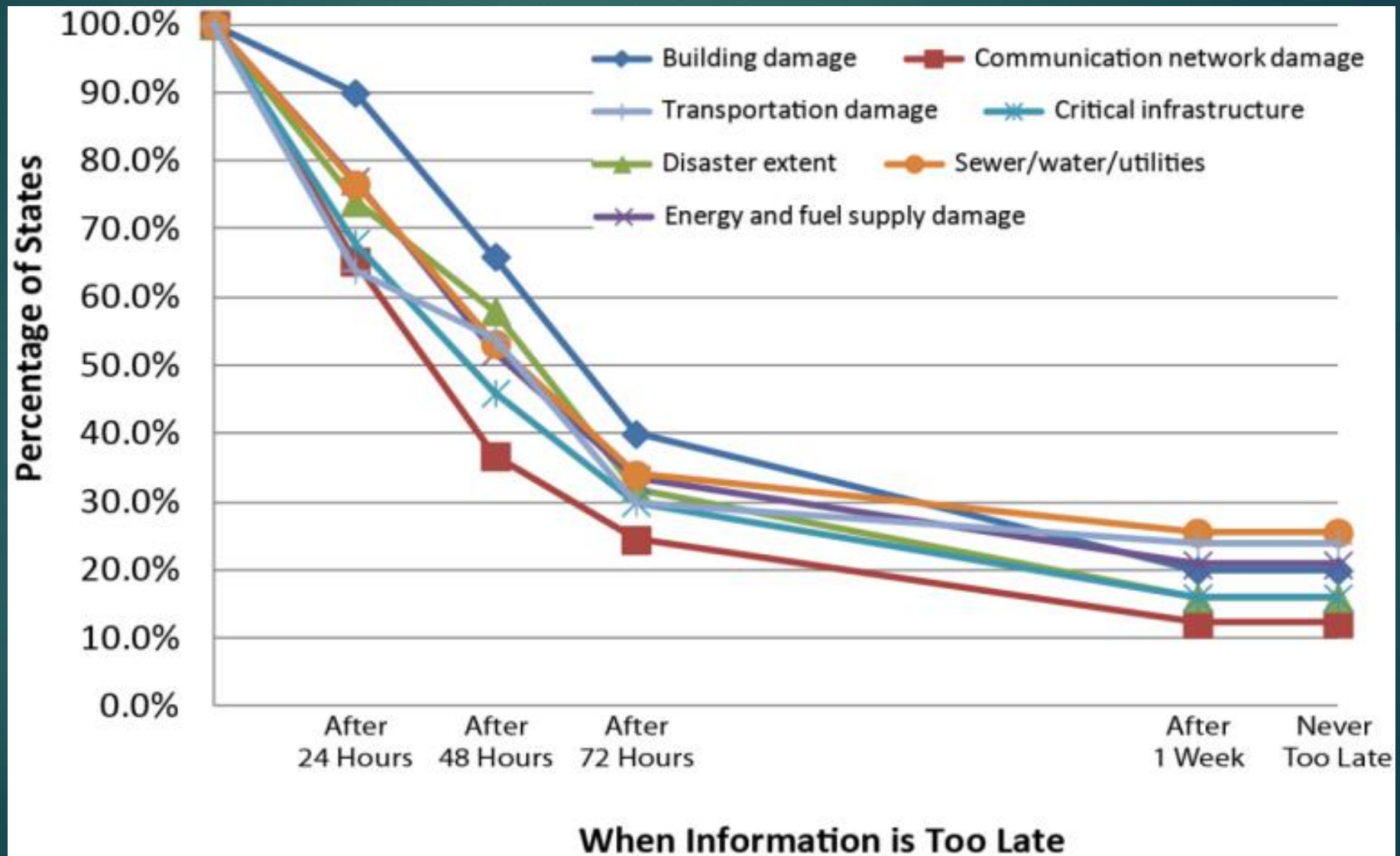
Low capital and running cost

Low skill (the robot does the actual flying & navigation)

Electronic data can be transmitted by satellite from/to any place on the surface of the earth

Computer analysis of data

Value of Information With Time



Main types of UAVs

Multicopter



Fixed Wing



UAV Capabilities and Limitations

Multicopter

Capabilities:

Very good camera platform

Vertical takeoff and landing

Limitations:

Low payload/endurance

Complex

Fixed Wing

Capabilities:

Good endurance/payload

Simple

Limitations:

Needs forward airspeed to fly

Desirable Features in a Disaster Response UAV

As simple and rugged as practicable

Transportable by airline as personal luggage:

- No liquid fuel or lubricants

- Maximum battery size 100 WH

- Packed weight NMT 30Kg per box

Fixed wing for maximum endurance/payload

Operate with zero local infrastructure

Operate from a Banana Boat:

- Hand launch

- Parachute/sea recovery

On site image analysis (reduces cost of data transmission)

Data analysis

Images appeal to the emotions but decisions are made on spreadsheets, so analyse images to extract data:

Virtual volunteers

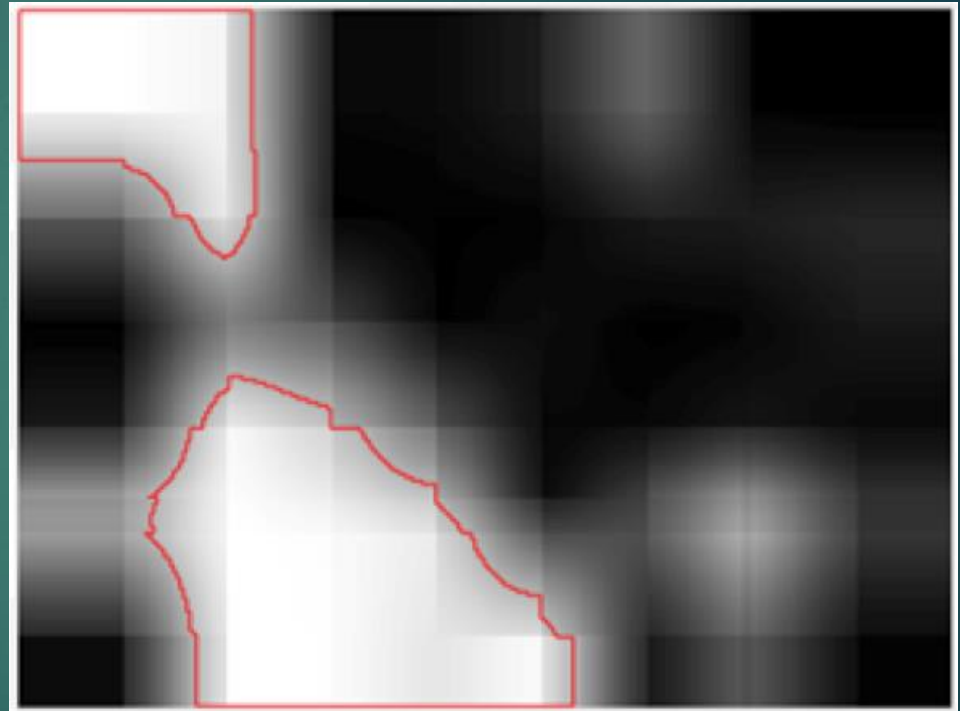
- Send video to humans for analysis

 - Expensive to transmit data

Machine intelligence

- Analyse the easy 70% and only send the difficult images to humans

Machine Vision



Marking Damage



Simple Damage Map



Barriers to Adpotion

Lack of familiarity

Not realising what is available

Unprofessional behaviour

Not knowing or ignoring the rules

Risk

Conventional aviation is very wary of UAVs

Tool not suited to environment

UAVs in Disaster Response

Any Questions?

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