Kenai Disasters

Spruce Beetles, Grassland Conversion, & Fire Risk

Maryland – Goddard
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US Forest Service

Concerns

Beetles **killed 5 million acres of forest** in Alaska in the 1990s

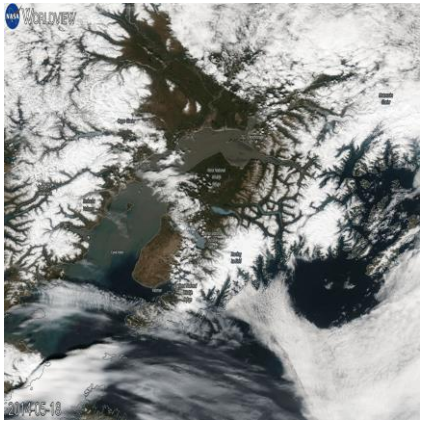
Flammable grasses take over dead forest

Beetle **outbreaks** becoming **more frequent**

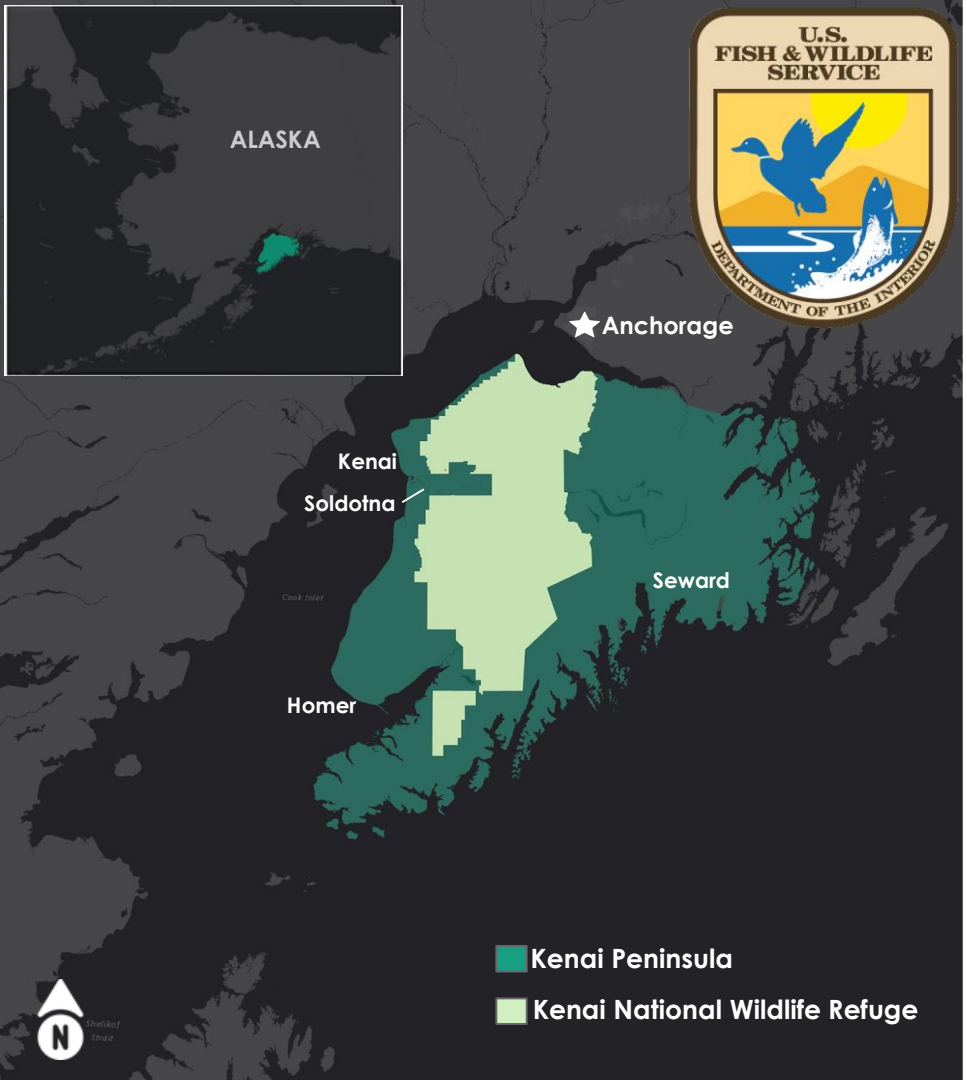
ru Carr/ High Plains Films; US Forest Service/Aldo Leopold Wilderness

The Problem

Infestation → **Grass Conversion** → **Increased Fire Risk**



L-R: Jacques Regad; US Forest Service; NASA WorldView



The Big Deal:

Habitat loss

High **population density** at risk

Economic/**Tourism** loss

Dangerous and remote **firefighting** conditions

Objectives

Observe ecological trajectory

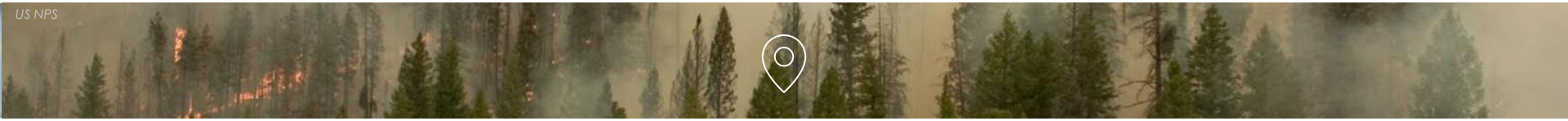
Detect high-risk areas

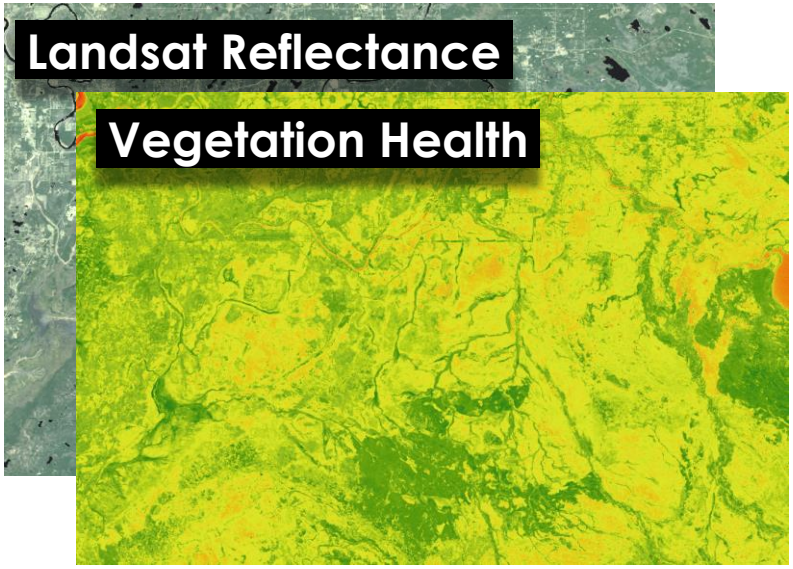
Support decision making

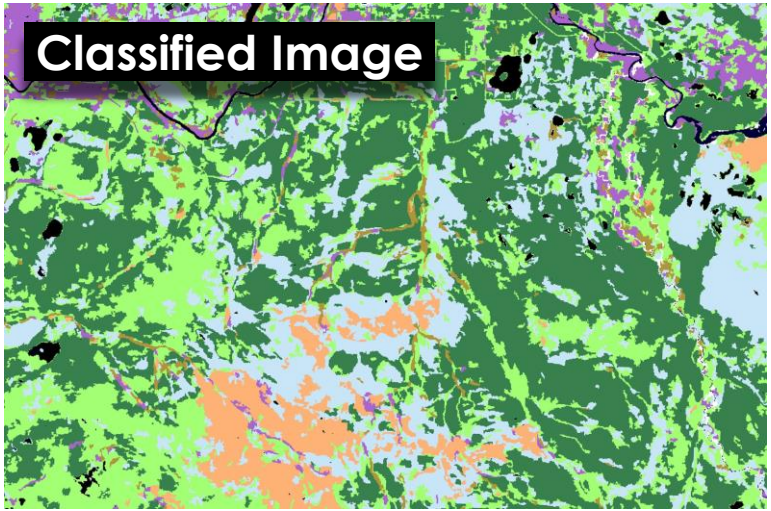
Build capacity

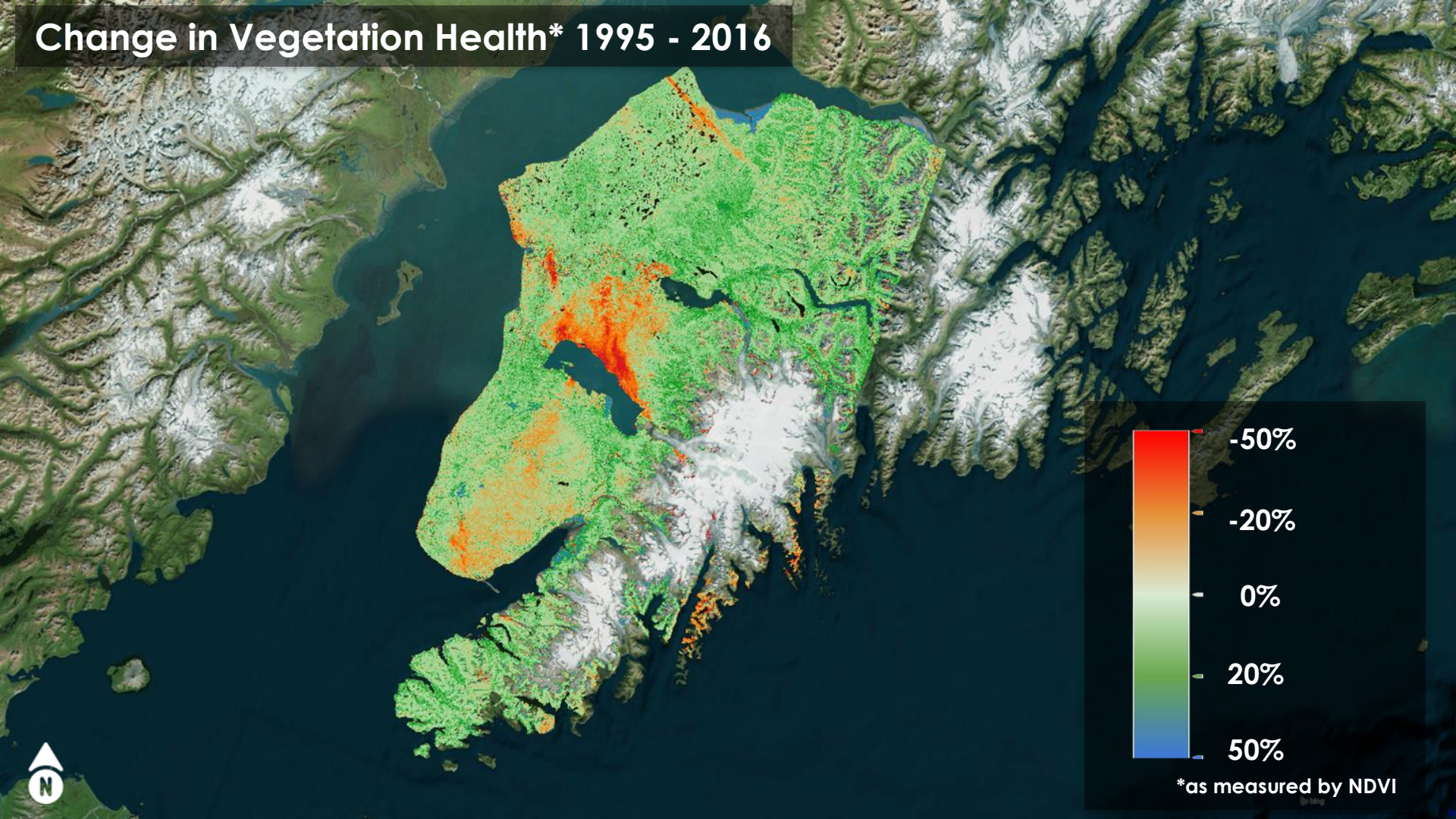
Dru Carr/ High Plains Films; US Forest Service/Aldo Leopold Wilderness Research Institute

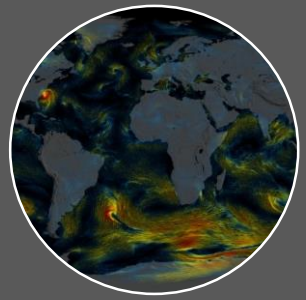
Classification








Change in Vegetation Health* 1995 - 2016
-50%
-20%
0%
20%
50%
*as measured by NDVI
N



Weather

Topography

Fuels

FIRE DRIVERS

US NPS

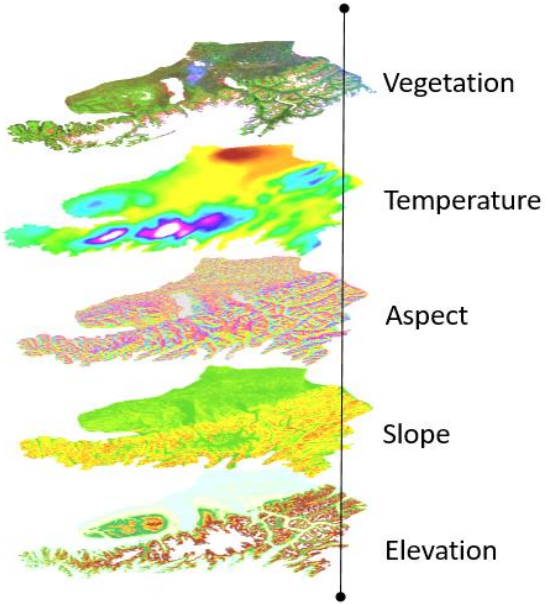
Modeling Fire Risk

Model Training

Historic Fire Pixels (MODIS)

+

Variables

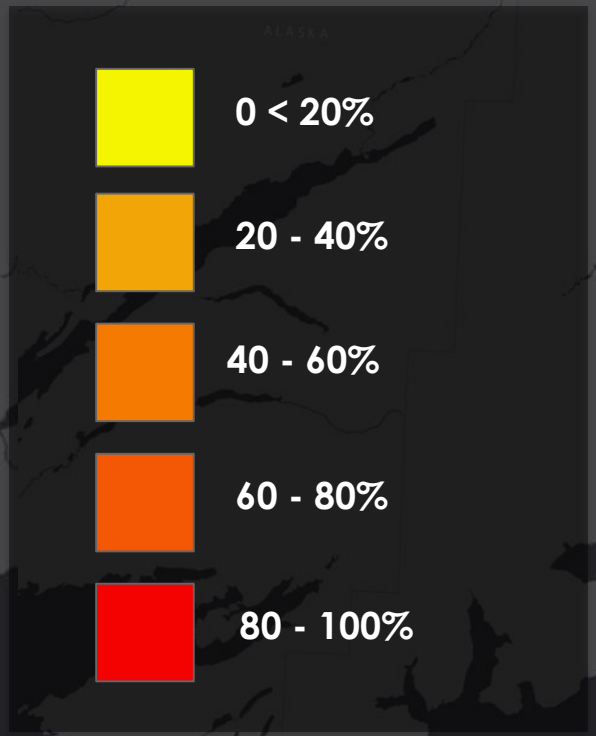


Algorithm

$$FP = \frac{1}{1 + e^{-z}}$$

FP (Fire Probability)

Fire Risk Probability (FP)



Future Directions



Soil moisture and temperature can be adopted into a **near-real time system**

Relationships between disturbances need more study

Lessons may **benefit similar ecosystems** in interior Alaska and the Yukon

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