

University of Nebraska-Lincoln

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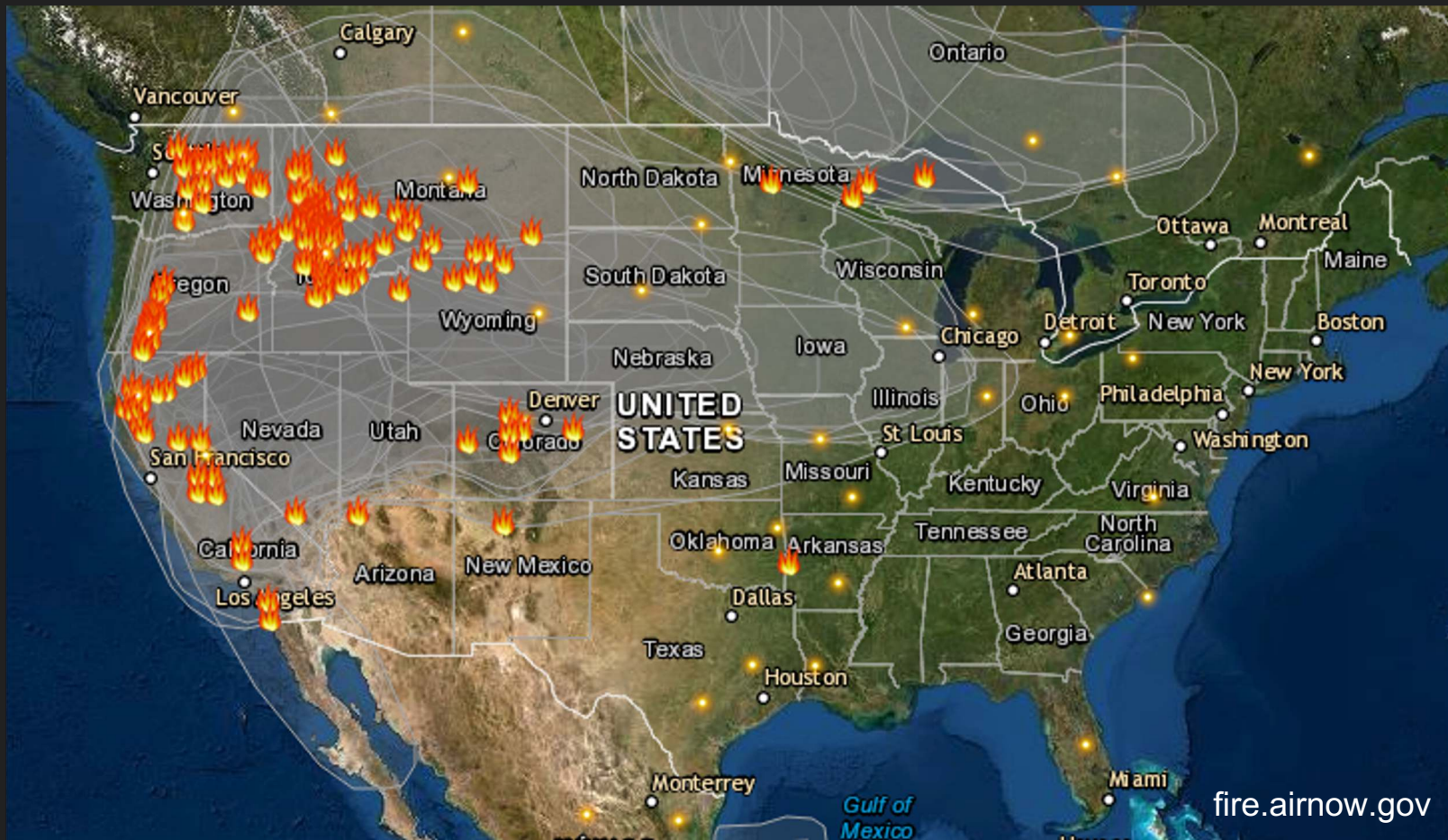
Drone Amplified: IGNIS

Drone-Based Aerial Ignition

Carrick Detweiler
CEO and Co-Founder
Drone Amplified
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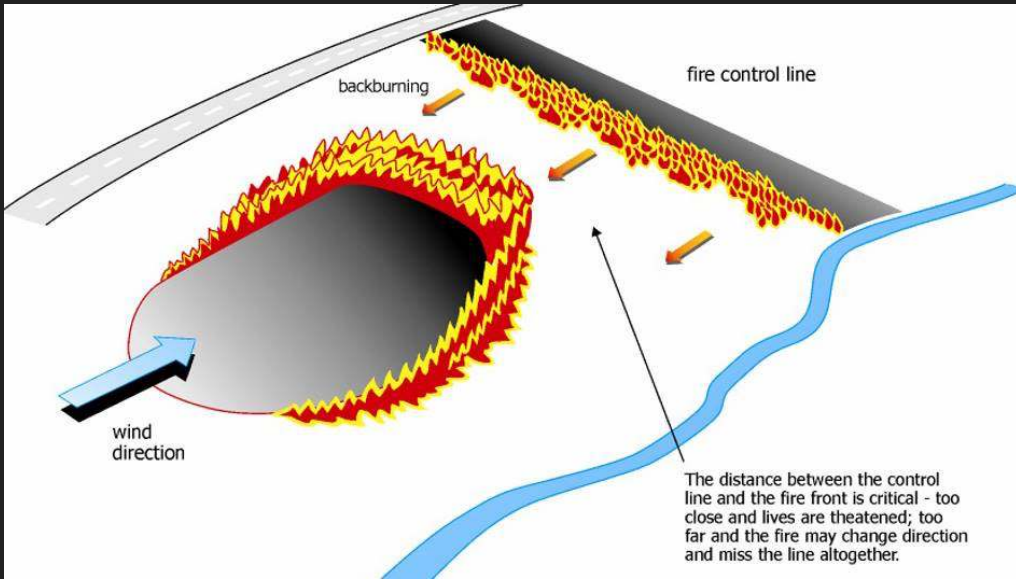


Wildfires September 2021



Prescribed Burns & Backburns

- Reduce fuels (dead material) safely
- Fight fire with fire



Founding of Drone Amplified

Reduce Risk, Increase Safety, Increase Availability

\$60B/yr in direct costs
\$350B/yr in damages



How we got started with fire

- Lunch with an interdisciplinary group after water sampling work (USDA Funded)



Dr. Craig Allen
Director, NE Cooperative
Fish and Wildlife Unit



Dr. Sebastian Elbaum
Comp Sci and Eng.
Nimbus Co-Director



Dr. Dirac Twidwell
Agronomy and Hort.
Fire Ecologist

~2014



Development of the 1st prototype

- Many months later we were convinced to try
- Used standard PSD (plastic sphere dispenser) balls
- Weekend of work (early 2014)
- Held six balls, successful ignition tests



Development of the 2nd prototype

- Put together a team of CS, ME, and EE students
- Number of iterations over ~9 months
- Leveraged existing software
- Same PSD balls



V2.0



V2.1



V2.2

Preparing for Outdoor Trials

- Indoor tests
- Outdoor “dry runs”
- Patent process
- Getting lots of permissions



Homestead National Monument

UAS Prescribed Burn at Homestead National Monument

NIMBUS Lab, Computer Science and Engineering
University of Nebraska-Lincoln



Lab Evolution



Jim Higgins
Mechanical Design



Christian Laney
Electronics



Evan Beachly
Software



Becca Horzewski
Sensors

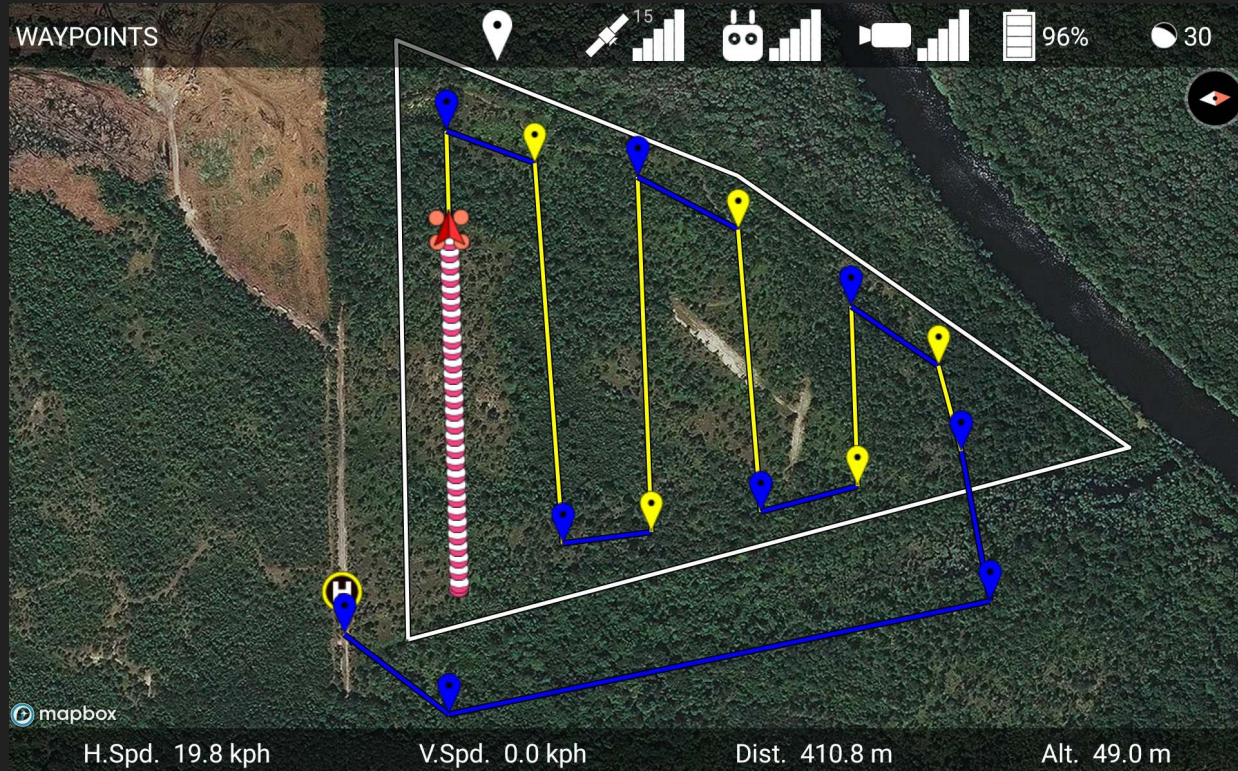
Drone Amplified: IGNIS System



- Attaches to customized drones. Made in USA
- Start backfires and prescribed burns
- Safety: moves people away from the fireline
- Cost: 10x lower than a helicopter
- Operates when/where people can helicopters cannot (night, low, ...)

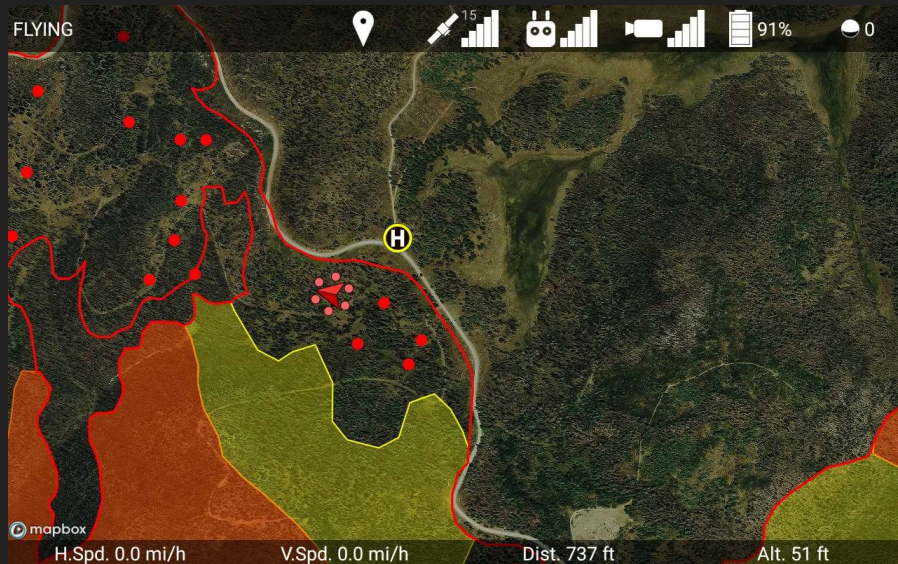
Drone Amplified: IGNIS App - Safety

- Designed by Drone Amplified (custom features available)
- Offline Maps
- Geofence for safety
- Programmable and autonomous missions
- Icons indicate where spheres were dropped



IGNIS App – Designed for Firefighters

- Overlay burn plans

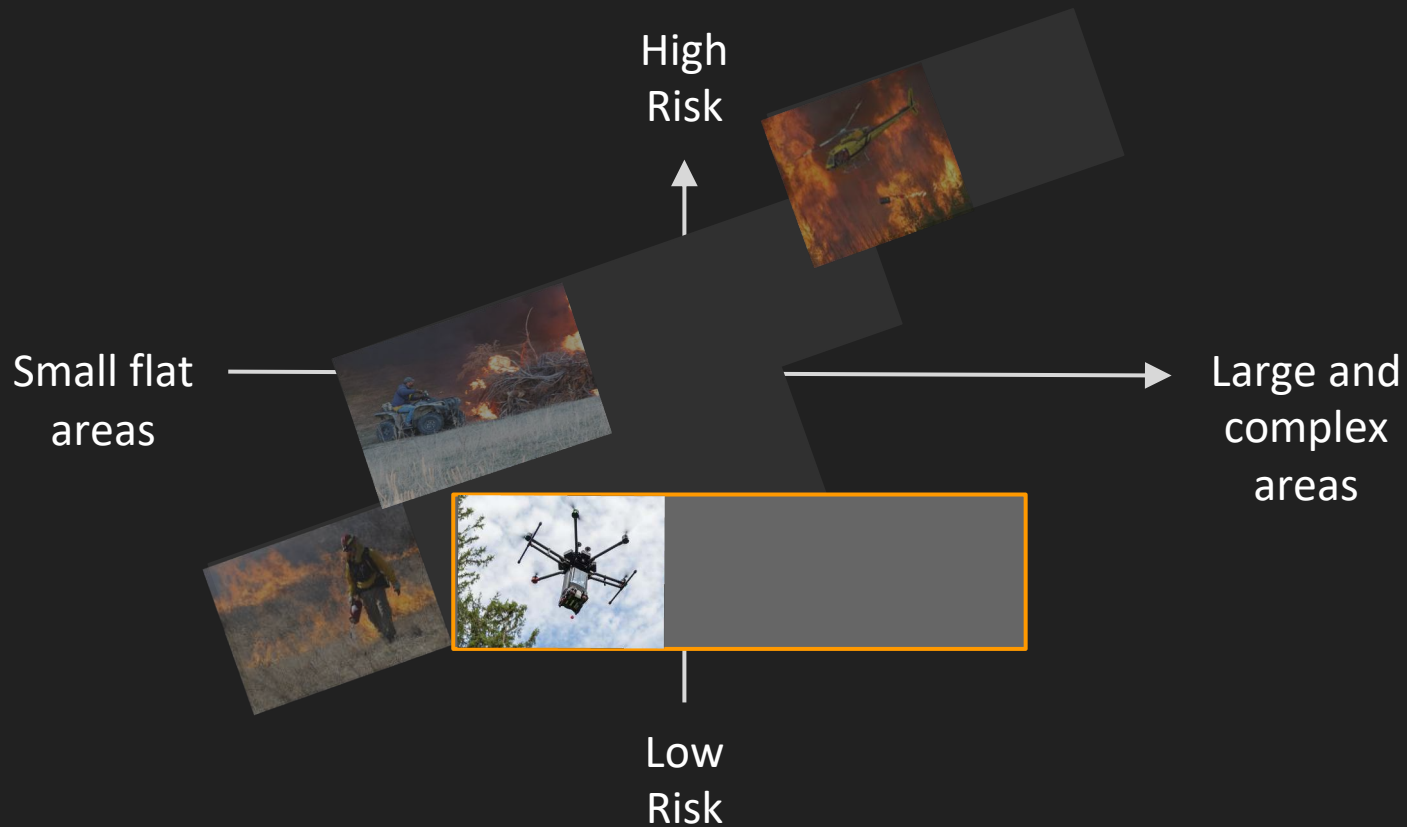


- Terrain awareness



Managing Fire

Puts People in Danger and is Costly



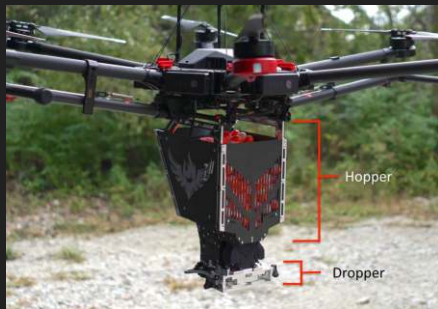
Video: <https://youtu.be/t1wPHoj5cQg>



2020 Fire Season

- USFS/DOI 50% of all UAS flights were with IGNIS for ignition
- Backburns and prescribed fire
- Used in CO, CA, OR, AZ, ...





Drone Amplified

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