FireWatch: Community Wildfire Risk Mitigation

Project Partners: Rancho Santa Fe Association Parks and Recreation Department and FireWatch

FireWatch
Community Wildfire Risk Mitigation

A new service developed by:

Richard McCreight
&
Gus Calderon

AirSpace Consulting

NEOS, LTD.

About Us

Richard McCreight

- Founded NEOS, Ltd. after working for NASA
- Over 25 years of aerial imaging experience
- Documented countless natural disasters
- USFS Helitack and Hotshot team member
- Research scientist at the USFS Fire Science Lab

Gus Calderon

- FAA Commercial Pilot
- Founded Airspace Consulting
- FAA Remote Pilot in Command
- Aerial imaging with aircraft and drones

Problem

- California wildfires are increasing at an alarming rate.

- Warmer, drier climates are causing more frequent and larger firestorms.

- Communities are experiencing escalating human and economic costs.

- Non-compliance is the reason that efforts to create defensible space around homes have had limited success.

Case Study: Rancho Bernardo Trails Community
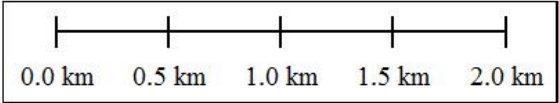## Witch Creek Wildfire – October 2007

Witch Ck Wildfire
27 Oct 2007

Rancho Bernardo Wildfire Damage
Aerial Map – October 2007

NEOS, Ltd 27 Oct 2007   Resolution = 6 inches
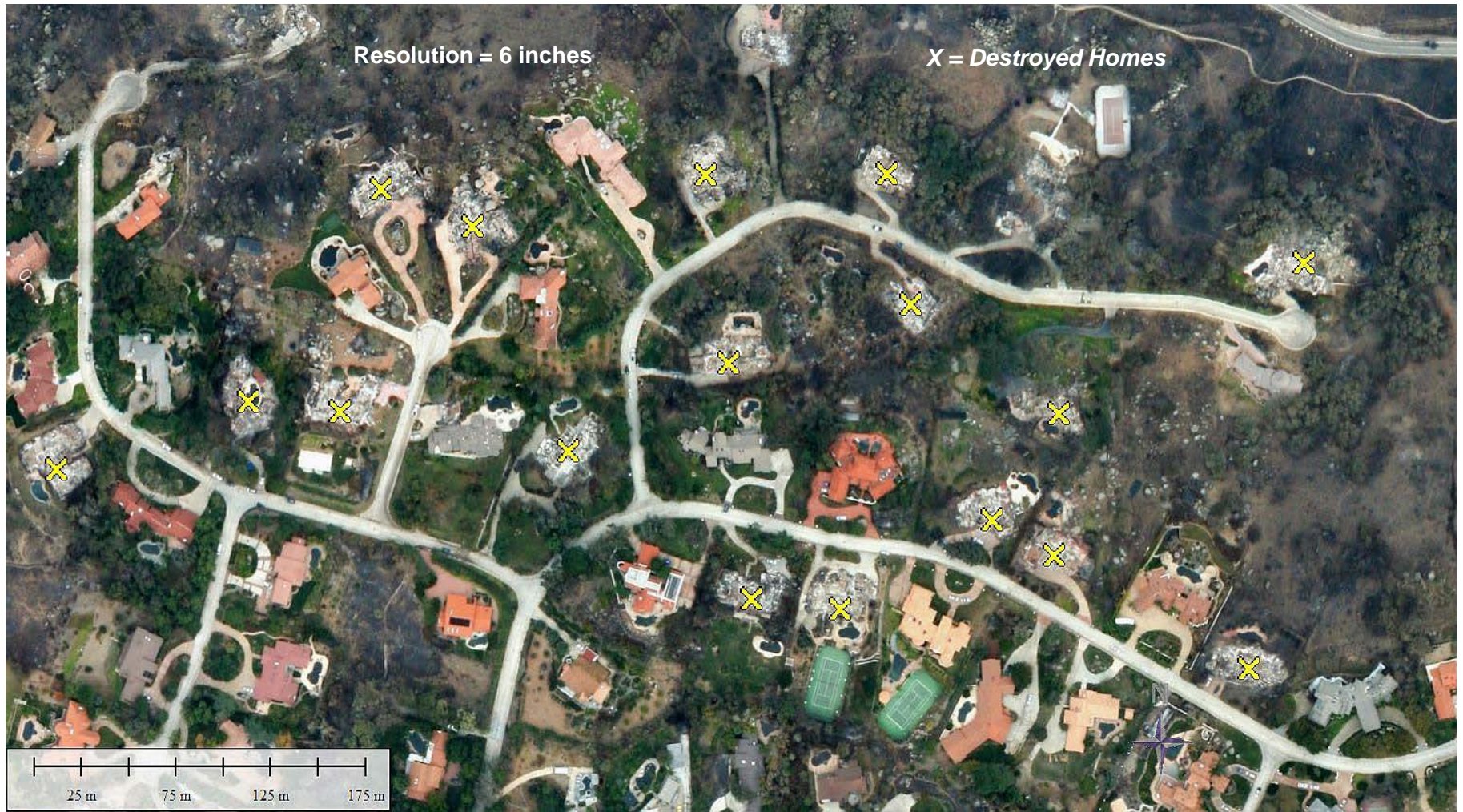
0.0 km   0.5 km   1.0 km   1.5 km   2.0 km

N

AirSpace Consulting

FireWatch

NEOS, LTD.

Rancho Bernardo Trails Community
Wildfire Damage - October 2007

X = Destroyed Homes

0 m   125 m   250 m   375 m   500 m   625 m

AirSpace Consulting

FireWatch

neos, LTD.

RB Trails Community - Fire Impacts
Enlarged Image Map - October 2007

Resolution = 6 inches

X = Destroyed Homes

25 m   75 m   125 m   175 m

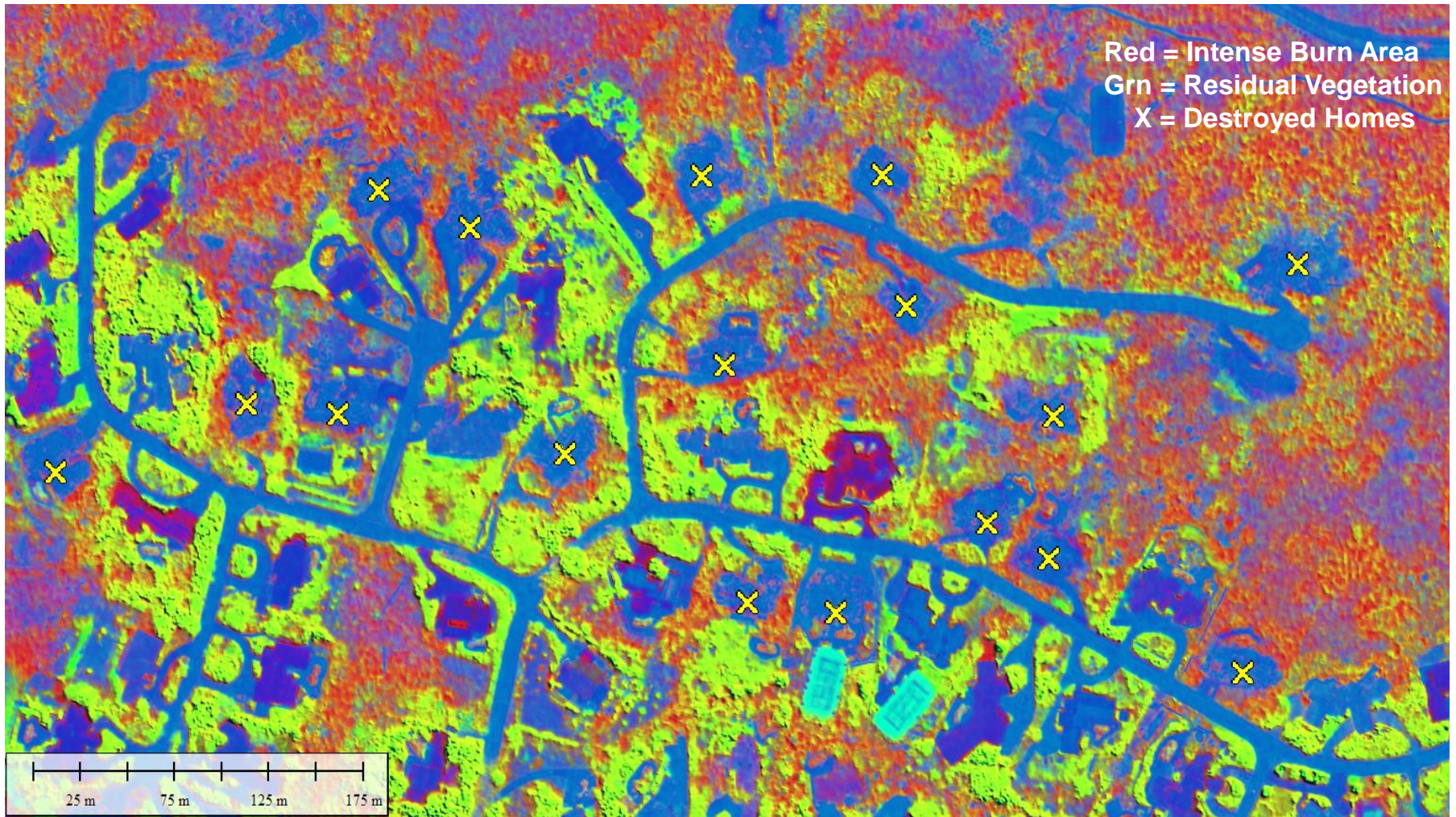AirSpace Consulting

FIREWATCH

NEOS, LTD.
www.neos500.com

RB Trails Community Pre-Fire Vegetation
Image Map 2005

RB Trails Community - Fire Intensity Map
Color Image Enhancement – October 2007

Red = Intense Burn Area
Grn = Residual Vegetation
X = Destroyed Homes

25 m   75 m   125 m   175 m

AirSpace Consulting

FIREWATCH

neos, LTD.

RB Trails Community Re-vegetation
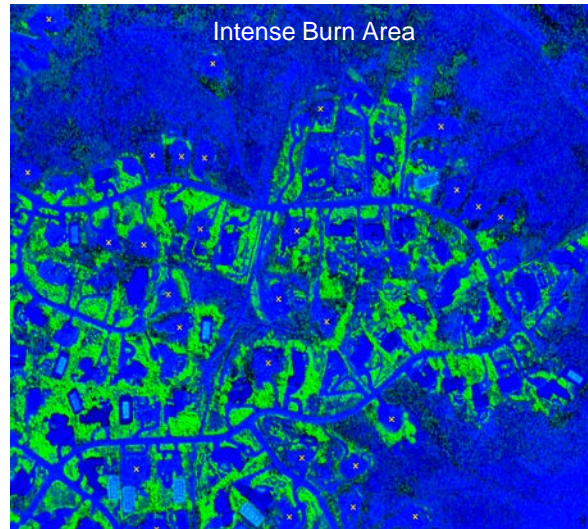## August 2018

NEOS, Ltd & ASC 2018

Rancho Bernardo Trails Community - Key Findings

2005: Pre-Fire
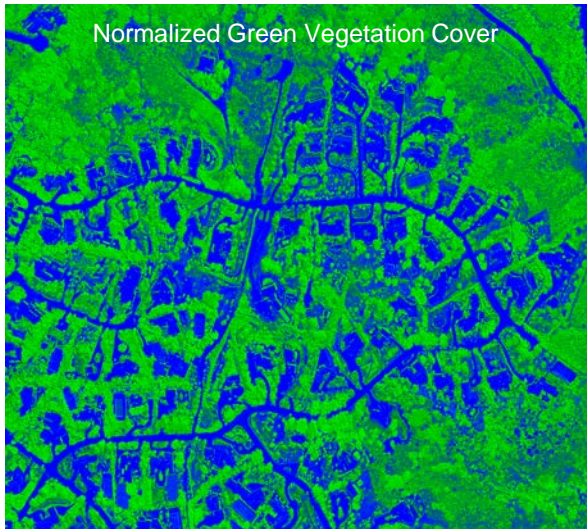
2007: Fire Impact

2018: Recovery

- The Witch Creek wildfire devastated more than 70 homes in the Trails Community.

- The majority of homeowners failed to clear vegetation near homes for defensible space.

- Vegetative fuel near structures was the greatest predictor of property destruction.

AirSpace Consulting

FireWatch

NEOS, LTD.
www.neos500.com

FireWatch

- A new service developed to empower communities to manage wildfire risk.

- High-risk zone identification from aerial images before the onset of wildfires.

- Decreasing wildfire risk protects lives and property and may reduce insurance liability.

Flight Plan for Rancho Santa Fe

Aerial Image – Rancho Santa Fe Golf Course

Color Infrared Image – Highlighting Vegetation
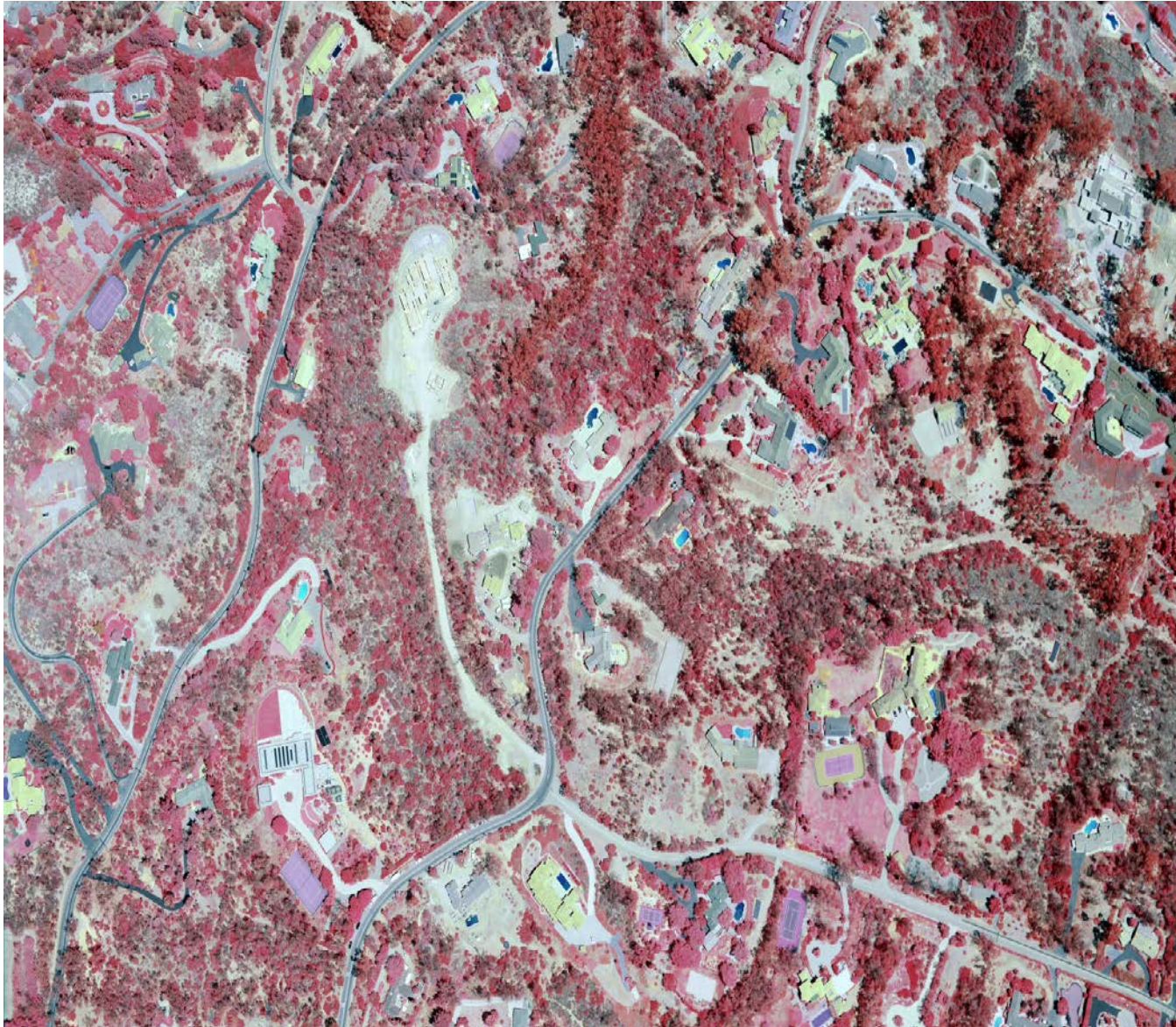
Color Infrared Aerial Map
Southern Half of Rancho Santa Fe

RSF-S_CIR Ortho_Map Preview
8 Aug 2019

FireWatch

Digital Surface Model
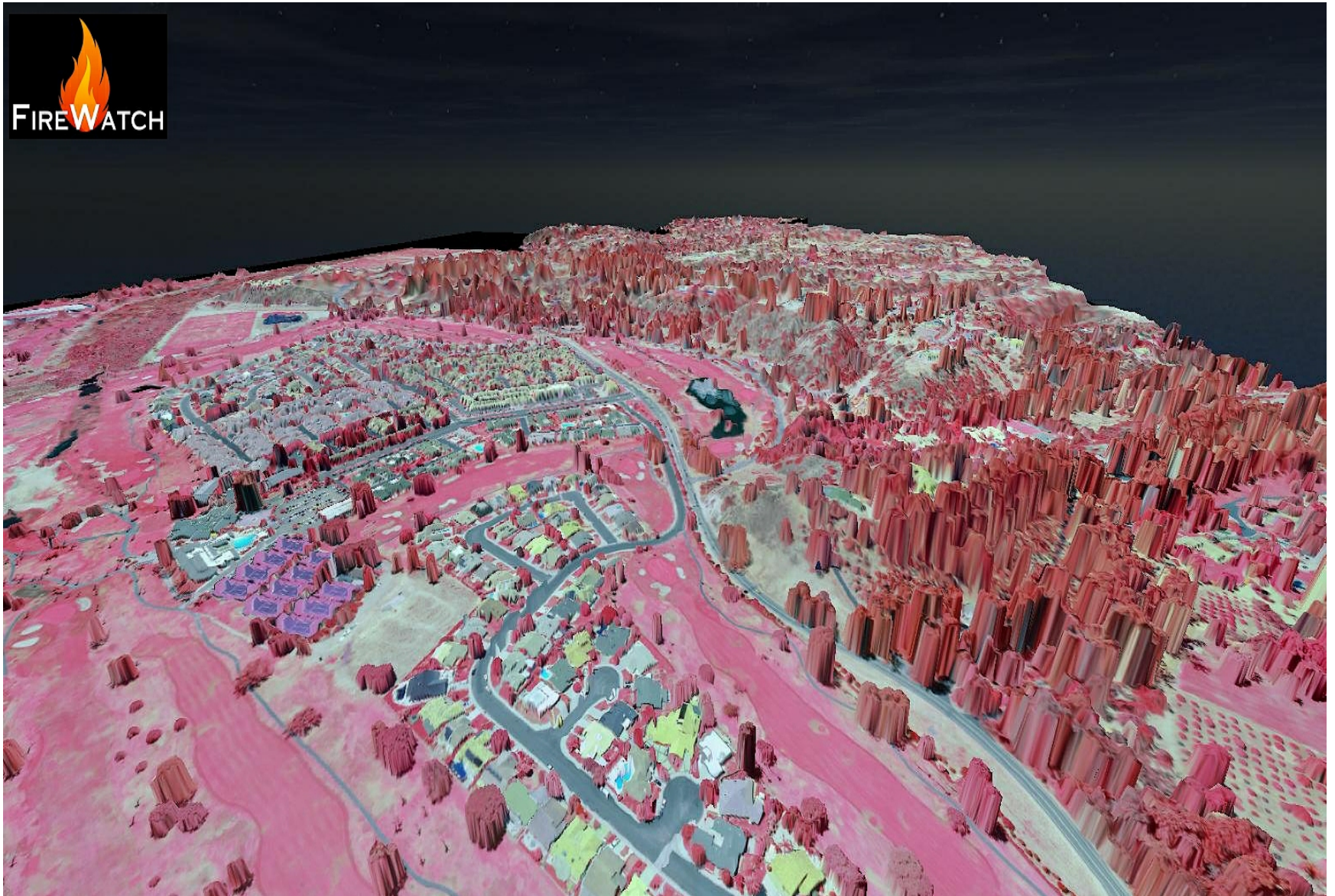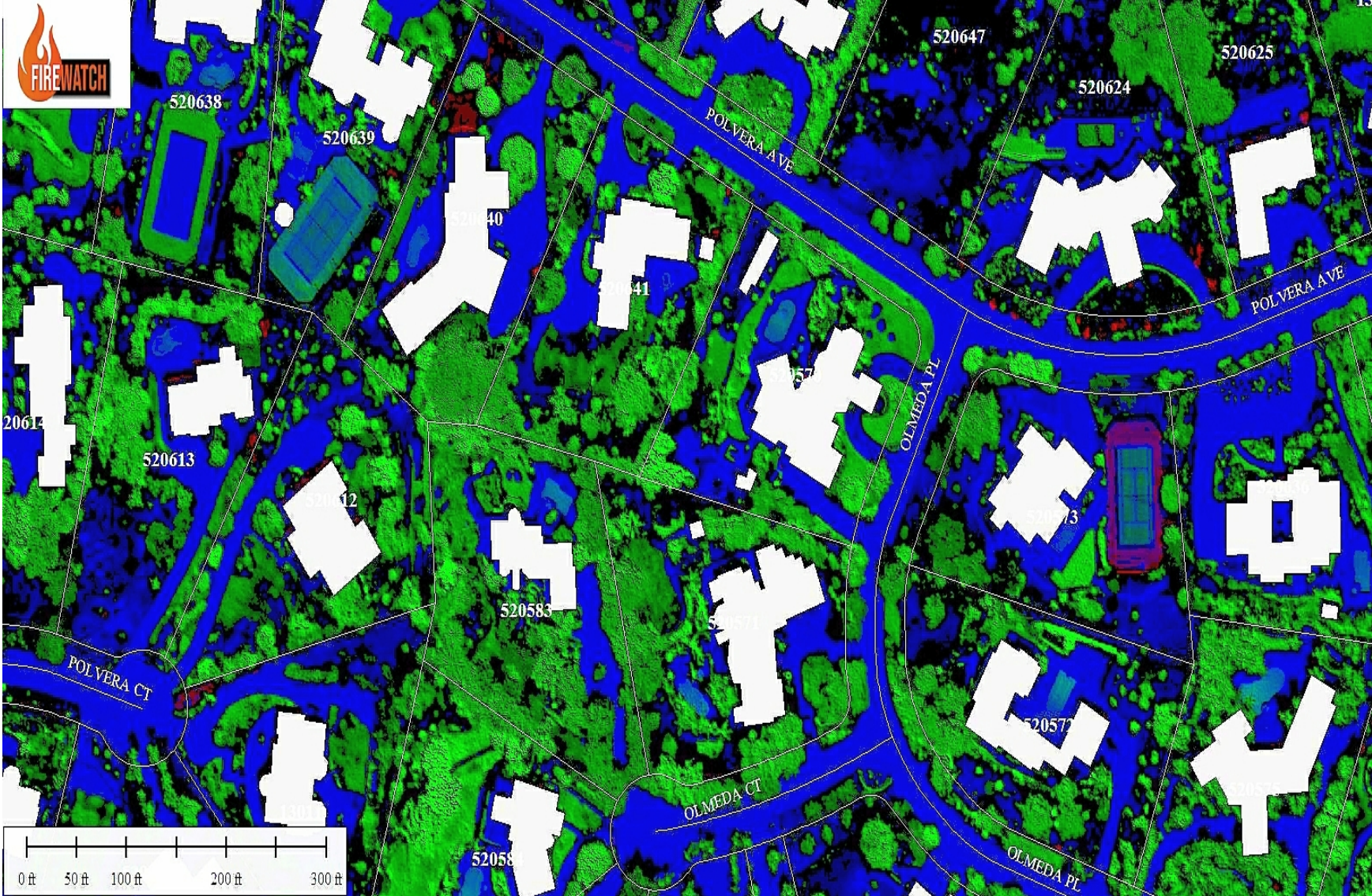## Color Infrared Image shows Vegetation Heights

Image Enhancement
Proprietary Algorithms for Analysis

Defensible Space Maps
Actionable Aerial Data

FireWatch is the Solution!

Our Approach:

- Collect multispectral data from an aircraft

- Process and analyze aerial images

- Create vegetative models with proprietary algorithms

- Integrate aerial maps into GIS for a relational database

- Use GPS acquired images over time for change detection

FIREWATCH

Conclusion

- Recent studies show that vegetation management is the single most important wildfire defense available to homeowners.

- Airborne analysis of the vegetative fuel in the community can provide the fire department and community leaders with actionable data for mitigating the risk of wildfires.

Gus Calderon
gus@airspaceconsulting.com

Richard McCreight
neos500@gmail.com

FIREWATCH

For questions regarding this project please contact:

Caitlin Kreutz

Rancho Santa Fe Association Parks and Recreation Department Assistant Manager

858-756-4652 or Caitlin@rsfassociation.org