



S-190 Unit 7: Alignment

Summary:

Defining the fire environment means discussing how fuels, weather, and topography each possess characteristics and properties that affect fire behavior. Independently, the effect these characteristics, and properties have can be somewhat predictable. When those individual elements align with one another, the potential for extreme fire behavior may occur.

Incident Position Description (IPD) Alignment:

This unit aligns with the following FFT2 IPD specific duties (<https://www.nwcg.gov/positions/fft2/position-ipd>):

- Apply the knowledge of fuels, terrain, weather, and fire behavior to decisions and actions.

Objectives:

Students will be able to:

- Describe how the primary wildland fire environment components – fuels, weather, and topography are made more complex by interaction with each other.
- Describe how alignment of these components greatly increases the potential for extreme fire behavior.

Unit at a Glance:

Topic	Method	Duration
Unit Introduction	Presentation	5 Minutes
Fire Environment Interactions	Presentation	10 Minutes
What is Alignment?	Presentation	10 Minutes
Alignment and Fire Behavior	Video Presentation	10 Minutes
Alignment of Fuels, Weather, and Topography	Video Presentation	10 Minutes
Total Unit Duration		45 Minutes

Materials:

- *Incident Response Pocket Guide (IRPG)*, PMS 461, <https://www.nwcg.gov/publications/461>.
- *NWCG Glossary of Wildland Fire*, PMS 205, <https://www.nwcg.gov/glossary/a-z>.
- Notebooks for participants.
- Ability to display images and video on large screen.
- White board or easel access for group breakout.

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Objectives

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- Describe how the primary wildland fire environment components – fuels, weather, and topography are made more complex by interaction with each other.
- Describe how alignment of these components greatly increases the potential for extreme fire behavior.

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- Review unit objectives.

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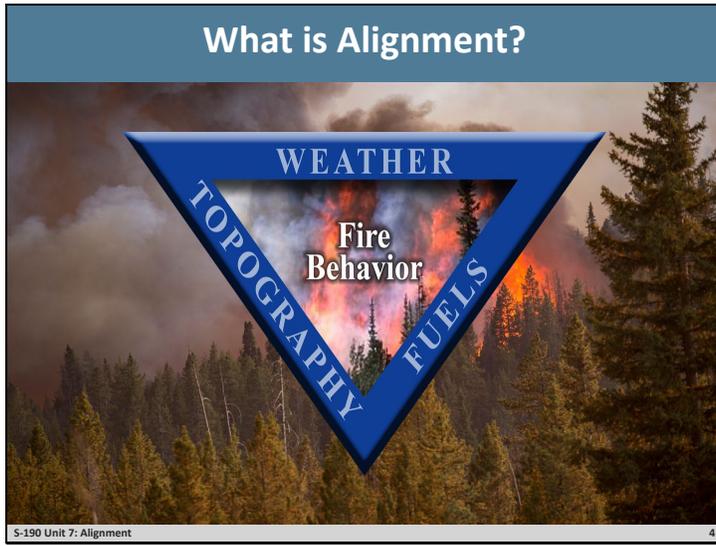
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- The components of fuel, weather, and topography do not exist separate from each other, but instead interact in complex ways.
 - **Topography-Weather:** Terrain features channel winds, or cause thermal belts that keep humidity's low through the night.
 - **Topography-Fuels:** Fuels on south aspects tend to have less moisture because of solar heating. Timber on North aspects tends to be more dense and more prone to crowning. Steep drainages gather logs and other fuels that roll downhill.
 - **Weather-Fuels:** Dry weather can turn plants that are normally a barrier into available fuel. Frost-killed leaves turn from live fuel to dead fuel and can dry quickly. Trees block the wind, reducing the intensity of fires in surface fuels below them.

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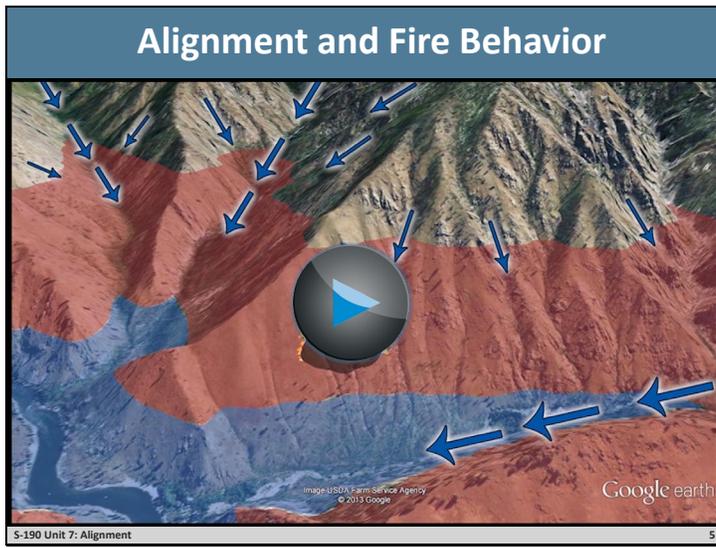
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- Alignment is when the components of fuel, weather, and topography interact, and align to create optimal conditions for extreme fire behavior.
- Common factors contributing to alignment are:
 - Availability of dry, continuous fuels.
 - High temperatures combined with a wind component.
 - Topographic features in line with the predominant wind component.
- ❑ Reference Alignments and Patterns for Dangerous Fire Behavior in the *Incident Response Pocket Guide (IRPG)*, PMS 461, <https://www.nwcg.gov/publications/461>.

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Pre-Video Discussion

- The video brings together the elements of the fire environment and how the alignment of these elements can, and has, resulted in extreme fire behavior. Alignment has caught experienced firefighters unaware, causing tragedies, and near-misses.
- Task students with writing down concepts and terminology presented in the video that relate to the alignment of fuels, weather, and topography.
- Play Video**

Title Alignment and Fire Behavior

Summary Introduction to the concept of alignment, and how it has caught firefighters unaware on the Salmon-Challis National Forest in Idaho.

Time (06:08)

Audio

Post-Video Discussion

- Lead students in a discussion on how the alignment of fuels, weather, and topography impact fire behavior.

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Pre-Video Discussion

- This video discusses how the alignment of fuels, weather and topography can produce fire behavior beyond what firefighters expect and how they can apply the understanding of alignment to their tasks on the fireline.

Play Video

Title Predicting Fire Behavior

Summary How alignment of fuels, weather, and topography can produce fire behavior that is more intense than expected. The recognition of alignment by firefighters to aid in safer daily tasks on the fireline.

Time (07:00)

Audio

Post-Video Discussion

- Lead students in a discussion on how the alignment of fuels, weather, and topography impact fire behavior.

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Summary

- **Alignment is a complex process that can surprise even experienced firefighters.**
- **As new firefighters, your ability to recognize when topography, fuels, and weather come into alignment will be one of the most important skills you can bring to the fireline.**

- Recognizing the potential for alignment helps firefighters be safer and more effective at their job.
- Awareness of alignment indicators helps firefighters avoid being caught by unexpected fire behavior.
- Recognizing where and when those factors will fall out of alignment helps firefighters find opportunities to be successful.

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Review unit objectives.