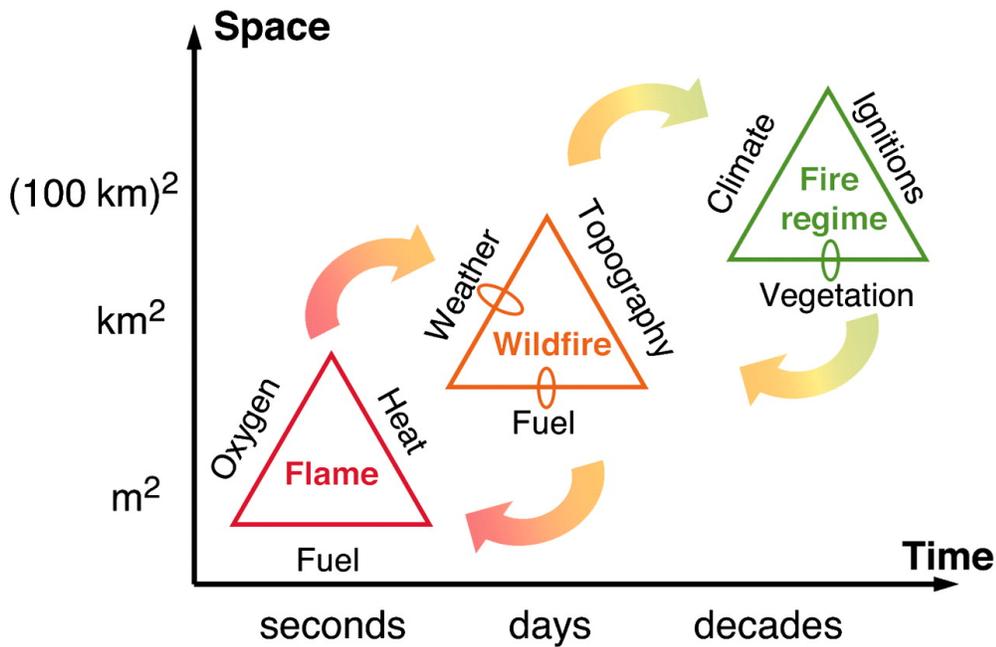


Fire Regimes and Controls on Fire at Different Scales.



Moritz M A et al. PNAS 2005;102:17912-17917

Scientists use different types of graphs and models to understand fire behavior. The graph above shows how scaling up from a single flame to a large region will have impacts on developing a fire regime for the future. “A ‘fire regime’ is the term given to the general pattern in which fires naturally occur in a particular ecosystem over an extended period of time.” *Dan Weston, Intern, Institute for Natural Resources (2010)* The small loops (O) show feedback on the controls themselves. Think about the fire triangle and how you must have all three components (fuel, heat and oxygen) to have a fire. The arrows (→) show interactions between different scales.

Frist, let's make sure we understand the scales on the graphs.

1. The Y axis is labeled _____
2. Why is the Y axis scale in square units?
3. The X axis is labeled _____

Graphs and charts tell a story and are often used by scientists to try and share information with other scientists or community members. The graphs show relationships and provide a platform for asking questions.

4. Why would small loops, representing feedback, be placed on fuel and weather in the middle triangle? In other words, how could these “controls” change in a wildfire?
5. What will be a global future impact on the fire regimes?
6. Why does vegetation have a feed back loop in the third triangle? What can happen to vegetation over time?
7. What part should humans play in regulating wildland fires instead of allowing fires to develop naturally?

Fire Regimes: Explanation

The graph is a part of the proceedings of the National Academy of Sciences and it was presented by Dr. Moritz and his colleagues (**Moritz M A et al. PNAS 2005;102:17912-17917**)

Understanding fire from a small flame on the end of a match to a large wildland fire is increasingly more important to citizens, scientists and policy makers. The length of fire seasons and the size of fires will increase as the climate warms and as world populations grow. It is predicted that more homes will encroach on the forest boundary making it more difficult to manage fires. Groups such as Firewise (<http://www.firewise.org/communities.aspx>) are providing education to help with community preparedness.

It is important to help students decipher graphs, ask questions and think of ways to solve the problems. This graph builds on concepts that they are familiar with and connects the scaling up factor as well as the natural fire regimes.

Starting with scale the students will be able to see the relationships between the scale of size and time. Answers to the questions:

1. The Y axis is labeled ___ *Space*
2. Why is the Y axis scale in square units? *Square units are used to indicate exponentially increasing area.*
3. The X axis is labeled ___ *Time*

Graphs and charts tell a story and are often used by scientists to try and share information with other scientists or community members. The graphs show relationships and provide a platform for asking questions.

4. Why would small loops, representing feedback, be placed on fuel and weather in the middle triangle? In other words, how could these “controls” change in a wildfire?
Fuel and weather can change depending on other variables such as density of fuel load, changing weather patterns or seasons.
5. What will be a global future impact on the fire regimes?
The major impact will be increasing global temperature that will cause drought in some areas of the globe and change the vegetation. Drought and warmer climate can stress trees leaving them vulnerable to infestations and diseases.
6. Why does vegetation have a feed back loop in the third triangle? What can happen to vegetation over time?
Vegetation will change over time due to warming climate and naturally occurring forest succession.
7. What part should humans play in regulating wildland fires instead of allowing fires to develop naturally?
Students can answer this question in many different ways. This would be a good time to talk about the policy of 100% suppression of wildland fires that took place over the last 100 years in the United States.