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### **Debriefing of Climate Change and Future Fire Regimes: Examples from California by Jon Keeley**

Keeley's paper outlines some basic principles that need to be recognized in fire regime research. In general, predicting future fire regimes is extremely complicated and has lots of extraneous variables that need to be considered such as spatial and temporal scale or weather patterns. The issue of anthropogenic impacts on fires is also quite alarming and will take both education and policy making to fix it.

Scale is very important when it comes to fire prediction because answers will vary if you use different scales. Keeley states that "large heterogenous landscapes may not fully capture accurate relationships between climate and fires (pg. 1)." This is because the large extent will not cover finer areas that have different landscapes than the rest of the body. This is commonly known as the modifiable areal unit problem (MAUP). MAUP is a statistical bias in which the scale you choose to analyze information may produce different results. This is recently discovered issue in GIS and there is a similar issue with temporal scale as well known as the modifiable temporal unit problem. Thus, it is important to critically choose and define your scales and state why you have chosen your scale in fire regime research.

Climate and weather are very important components to fire regimes. Temperature affects the moisture in the air. If there is warmer weather for long periods of time, there is a more likely chance for a fire because of the lack of moisture. Precipitation also has the ability to create more or less fuel volume. If it rains more, there will be more vegetation which can burn in the dry months. Both variables are very important for predicting fires. Climate has a more complicated relationship with fire because climate may have more of an influence in some regions than others. This goes against the popular belief that fire is directly influenced by climate. The truth is more complex and will take a lot more research to uncover.

Fires are also driven by direct anthropogenic impacts because of human habitation. This is especially true in southern California because the urban sprawl entices more people to live here and more people to build houses. These houses expand to vulnerable wildlife areas or in more condensed spaces. This only worsens the problem and will create more fires in the future.

To currently lessen the chance of a wildfire in California, it is important to implement both education and policies. Education is the first step in teaching people the effects of their actions and how to protect themselves. We can teach people how to have more fire-friendly houses from the structure of the house or simply what type of doormat they use. Policy is also important because without policy, people will continue to provoke fire risks in privacy. Both methods used together will help implement a safer fire future for California.