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GEOG 696

Debriefing Paper

Title

A review of Studies Dealing with Tree Rings and Rockfall Activity: the Role of Dendrogeomorphology in Natural Hazard Research

Summary

This article is a literature review dealing with the various ways that tree ring data can be used for analysis of rockfall activity. Typically, this type of research has been done using historical archives, lichenometric studies, or through frequency-volume statistics. The overall purpose of this paper is to present a literature review study about the current state of tree ring research as it pertains to rockfall activity and to what extent dendrogeomorphology contributes to rockfall research.

The author starts the paper with a small introduction on some of the common ways in which rockfall activity is analyzed. An emphasis is put on how difficult it is to obtain historical data on rockfall activity because records are often nonexistent and hard to find for single events. Lichenometry also has its limitations, as the method is based on a measurement and analysis process that can be interruptive and may only have low resolution data. It is the purpose of this introduction to introduce the idea of using tree ring data for rockfall analysis due to the possible inaccuracy of the current research methods. This introduction is also used to outline the rest of the paper and explains what will be accomplished in the paper. The goals of this paper are to give an overview of tree ring studies involving rockfall activity, show the potential of dendrogeomorphology, and to present the strengths and weakness of the using tree rings in natural hazard studies.

The reason that tree rings can be used for rockfall analysis is because trees react immediately to disturbances in the environment. Abnormalities such as scars, callus tissue, and other traumas are results from the disturbance. Tree rings are an accurate source for dating because they form yearly increment rings. These can then be used to date disturbances from natural hazards.

The author presents several case studies. The focus is on two ways to analyze tree rings, stem discs and increment cores. The stem discs are taken from felled trees. In the studies presented the discs were taken from the basal area of the trunk up to the crown. The analysis of these discs can show the specific year that rockfall activity affects the particular tree. Taking

increment cores is an alternate to this method in areas where there are no felled trees. This is a non destructive way to gather samples where cores are obtained using an increment bore. The author presents a study of each, and one additional study that used both methods. This gives the reader an opportunity to review all of the methods that are used in dendrogeomrphology research.

The end of the article is a rather lengthy discussion on the strengths and weaknesses of tree ring studies and rockfall research. Tree ring studies have the ability to supply data on rockfall activity in areas where historical records are incomplete. The seasonal timing can be estimated to better manage risks on hiking trails, areas of transportation, and or important habitation corridors. The influence of this data can also be helpful in dam management and other areas that need protection. In addition to the strength's, the weaknesses of the data are clearly lined out. The author points out that the techniques and methods need further refinement. It is also stressed that sampling strategies need to be established. In the case studies presented all three used different techniques and the author suggests a need for more random sampling methods.

The point of this article was to bring dendrogeomorphological research to show that this is an underutilized and successful way to analyze rockfalls. The continued development of techniques and use of comparative studies in different regions will show that tree rings are very important to rockfall activity.

Class Discussion

The main topic of discussion in class was the use of this piece as a literature review. Overall, it was the consensuses of the class that this article is a great example of a literature review. This is important because a literature review is a major part of the thesis that we will all be undertaking.

This was a thorough literature review that explained the current state of research in the field of dendrogeomorphology. The outline of the paper clearly states the purpose, **to present a literature review to survey the current state of investigation dealing with tree-ring sequences and rockfall activity, with an emphasis on the extent to which dendrogeomorphology may contribute to rockfall research.** It was decided that this was justified and validated by the information presented. The paper focused on specific case studies that showed the different ways that the data is obtained and the various methods that are used in collection. The class focused on this point because this is what makes the literature review important. The research that is done by others shows what is "missing" in the field and provides a doorway to introduce your own research.

It was also pointed out that the literature review is also an opportunity to identify the movers and shakers in that specific field. If you find that a person is cited often in works that you are reading it would be a good idea to look this person up specifically. It is a good idea to

follow up on citations and read that actual document of the person cited rather than taking the second hand information for a literature review. Everyone manipulates information in different ways, so it is a good idea to follow up on the information in the literature review at the source.

The class concluded that this article is a good road map for a thesis literature review. The ideas are clearly laid out, and follow a structure that makes for an easy read. The importance of the article is that the author ends up proving the goals set up in the opening paragraph. Through the case studies, the important ideas and themes of dendrogeomorphology are woven into the paper. This allows for the analysis of the field. The author is then able to present the strengths and weakness of the ideas.

Overall, this article was used by the class as a tool for a good literature review. The overall content of the article was not as important as the concepts are ways that the author presented the paper. This was important for the students to be presented with a complete and thorough example of a literature review. This is an example that can aid in the start of our own literature review for are theses.

Definitions

Dendrogeomorphology- The use of dated [tree-ring](#) series to study land-forms and Geomorphologic processes.

Lichenometry- A technique that is used for dating Holocene events. Lichens are not present in glacial formations but when they become stable they colonize surfaces and become larger over time. Used as a reference point for dating.