Cyclicanes

New Mexico Supercomputing Challenge Final Report April 2, 2008

Team #46 Jackson Middle School

> Team Members Sara Ahlgren Marty Cabeen Kylee Dickinson Marinna Hood

<u>Teachers</u> Mrs. Glennon

Project Mentor Nick Bennett

Table of Contents

- 1. Table of Contents
- 2. Executive Summary
- 3. Statement of Problem
 - 3. Method
 - 4. Code
 - 5. Diagram, Atlantic
 - 6. Results
 - 6. Conclusions
- 7. Software, References, and Tables
 - 8. Most Significant Achievements
 - 9. Acknowledgements

Executive Summary

We decided to look at hurricanes because one of our team members was let out of school because of a hurricane warning, another wanted to see why hurricanes hit the land the way they do, one more wanted to see if they had cyclical patterns, and the last wanted see how a hurricane has different intensities.

We started our project by researching lots of different things about hurricanes such as how they form, the different parts of a hurricane, how global warming affects hurricanes, the history of hurricanes, and we also looked up simulations of hurricanes. We looked up how far back hurricanes went and the different intensities of those hurricanes, and we put the information in an Excel spreadsheet. We also used that information to put in our R program.

Some things that we ran into as problems during our project were at first, we could not find any patterns or trends in the hurricanes. At the beginning of the project, we had lots of issues of who was in our team and what our project was going to be, and having time to be able to finish the programming before the deadline. Some of the easy things that happened during the project were finding our hurricane simulation, finding the website we use for the information for our Excel, and, once we picked out our project, writing our proposal.

In the end, we did find cyclical patterns in our program. We did all of our programming in R Software version 2.6.2.

2

Statement of Problem

Purpose: To find cyclical patterns between hurricanes.

Procedure: We will research/model about past hurricanes. Find temperatures of water and air, distance from the equator, how long it takes from their origin in the ocean to when they hit the land.

Method

Our objective for doing this project was that we wanted to see if hurricanes had cyclical patterns. We did this by researching the different types of intensities of hurricanes, the history of hurricanes, global warming's affect on hurricanes, and the different intensities of past hurricanes through 1900 for the Atlantic Ocean and 1945 for the Pacific Ocean. We put the information of the past hurricanes intensities into our R Software program, which we used to see if there are any cyclical patterns using the diagrams we created.

<u>Code</u>

	tropical					
Years	storms	intensity 1	intensity 2	intensity 3	intensity 4	intensity 5
1958	3	2	0	2	2	1
1959	4	5	0	1	1	0
1960	3	1	1	0	0	2
1961	3	1	0	3	2	2
1962	2	0	2	1	0	0
1963	2	2	3	0	1	0
1964	6	0	0	2	4	0
1965	2	2	1	0	1	0
1966	4	4	0	2	1	0
1967	2	4	1	0	0	1
1968	4	4	0	0	0	0
1969	6	5	2	3	0	1
1970	5	2	1	2	0	0
19/1	/	4	1	0	0	1
1972	4	2	1	0	0	0
1973	4	3	0	1	0	0
1974	3	1	1	1	1	0
1975	2	1	2	2	1	0
1970	ے 1	Ζ	2	2	0	0
1070	1	4	0	0	0	1
1970	03	2	1	0	۲ ۲	0
1979	2	2	3	1	1	1
1981	4	т 2	1	2	1	1
1982	3	1	1	0	1	0
1983	1	2	0	1	0	0
1984	- 7	- 3	1	- 1	0	0
1985	4	4	0	2	1	0
1986	2	3	1	0	0	0
1987	4	2	0	1	0	0
1988	7	2	0	0	2	1
1989	4	3	2	0	1	1
1990	6	5	2	3	0	0
1991	4	1	1	1	1	0
1992	2	1	2	0	0	1
1993	4	2	1	1	0	0
1994	4	2	1	0	0	0
1995	8	4	2	2	3	0
1996	4	3	0	4	1	0
1997	4	2	0	1	0	0
1998	4	3	4	1	1	1
1999	4	0	3	0	5	0
2000	6	4	1	1	0	0
2001	6	4	1	2	2	0
2002	8	1	1	1	1	0

2003	9	3	1	1	1	1
2004	5	2	1	2	3	0
2005	12	7	1	2	1	4



R Diagram, Atlantic



Results

We did end up finding cyclical trends in our diagrams we created in R Software. We also found out a lot more about hurricanes that we knew before, such as the different intensities, parts of the hurricanes, the history of hurricanes, and global warming's affects on hurricanes. We learned a lot about how to program with R Software, such as how to write the code, what kind of graphs we need to use, and how to determine what the graph says.

Conclusions

Our conclusions were that hurricanes do have cyclical trends, global warming does affect the hurricane's strengths and intensities. There were also higher intensities and more hurricanes as the years went on.

Software, References, and Tables

http://hosted.ap.org/specials/interactives/_national/hurricanes/index_c ategories.html -http://weather.unisys.com/hurricane/atlantic -http://weather.unisys.com/hurricane/w_pacific -Excel -PowerPoint -Microsoft Word

-R version 2.6.2 software

Most Significant Achievement

Our most significant achievements during our project was...

Sara: Working on the programming with Nick, and making the Excel spreadsheet.

Marinna: Worked on programming with Nick, and making the Excel Spreadsheet.

Kylee: Finding our hurricane simulation.

Marty: Was when I found all of the information for global warming's effect on hurricanes.

Acknowledgements

Special thanks to the **Jackson Middle School PTA** for their financial support of our projects

Chaperones: Kathy Kortkamp, Mary Anne Holton, Laryssa Slaton, Jenifer Jannakos, and Chi Huyhun.

To our mentor, Nick Bennett

And last but not least, to our sponsor, Karen Glennon, who has been nothing but supportive to us this during our entire project