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Ground Deformation Monitoring to Resettle People at risk of Landslides in Bududa District : what are the land Administration Issues?

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Introduction

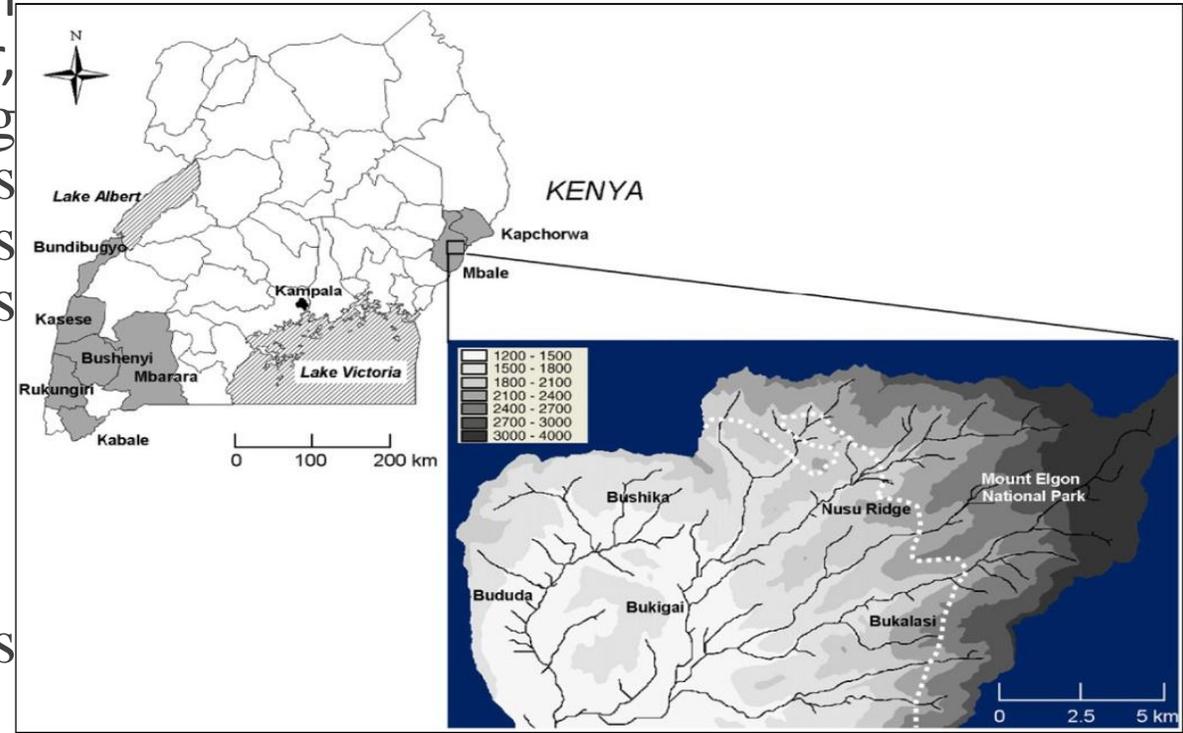
- When natural disasters happen, people are normally resettled in safe areas to protect them from loss of life and property. Resettlement is normally based on the extent of destruction mapped after a disaster has happened. Scientific methods have been developed to determine areas at risk. Susceptibility information is then used to resettle people. In Bududa, resettlement has been mostly after a landslide occurred. Scientific methods are now being used to determine areas at risk and it is critical to use such information to resettle people not after property and lives have been lost. GIS based landslide susceptibility mapping, geological surveys and weather forecasting have been used in Bududa though have their limitations. The GIS technique could be static and subjective. Soil and rainfall information should be used together and not separately as it has been commonly done. Deformation is a very promising method because it's a manifestation of a combination of all the landslide casual factors.
- Landslide victims have been settled in Kiryandongo and Bulambuli having prospects. The success has mixed success due to a number of issues that range from social, cultural, political and economical.



Bududu District

□ Bududa district is divided into five transect zones, **Bukigai** consisting iron rich Rhodic Nitisols red soils in colour, **Bududa** and **Bushika** zones containing Lixisols, Cambisols, Nitisols and Acrisols soils, **Nusu** ridge and **Bukalasi** zones constitute Ferralsols, Lixisols, Gleysols and Acrisols.

□ Bududa has an average altitude of 1250 to 2850m and 3000 to 4000m in the East. Average rainfall of 1500mm per year and a bimodal rainfall pattern of two dry spells **December to February** and **July**





Methods

- Ground deformation in Bududa District was investigated using the InSAR technique and SAR imagery before the 2nd March Nametsi Landslide.
- A review was done of the resettlement process of victims in Bududa district. This included the resettlement to Kiryandongo, prospective resettlement to Bulambuli and individual resettlement strategies by people at risk as a coping strategy. Interviews were conducted to get the technical, political and local perspectives.
- A link is made, how landslide victims in Bududa should be resettled, given the deformation patterns, with reference to the Nametsi landslide and what land administration issues have emerged and how these could be resolved or minimized.



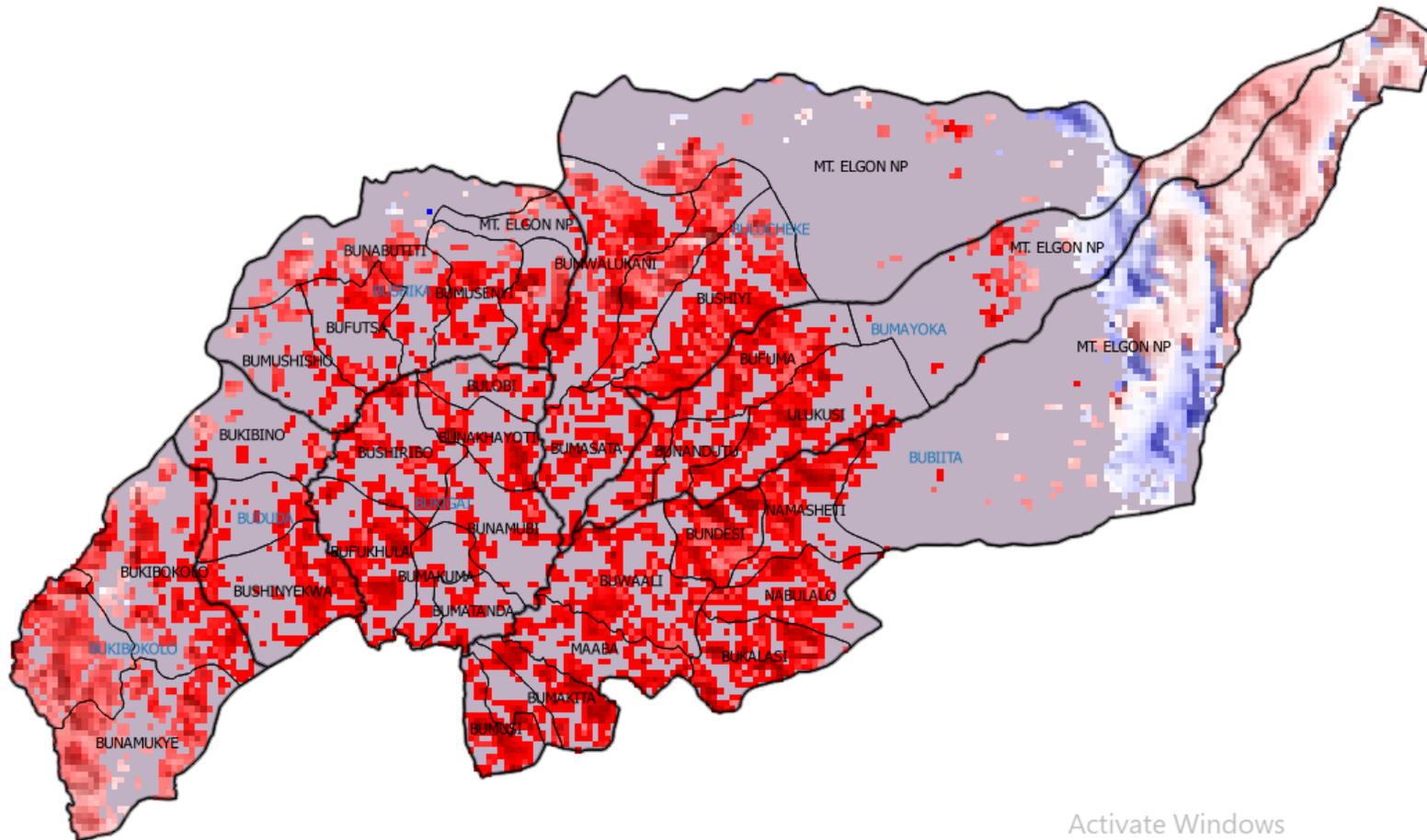
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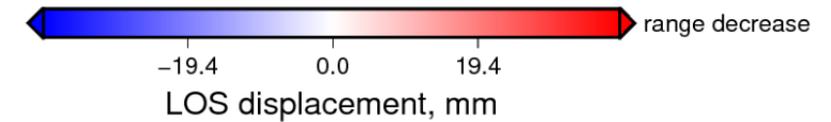
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Ground Deformation Measurement Patterns



8 Sept 2007 to 24 Jan 2008
5 months



Legend

- Bududa_District
- Bududa_Subcounties
- Bududa_Parishes
- Ground Deformation



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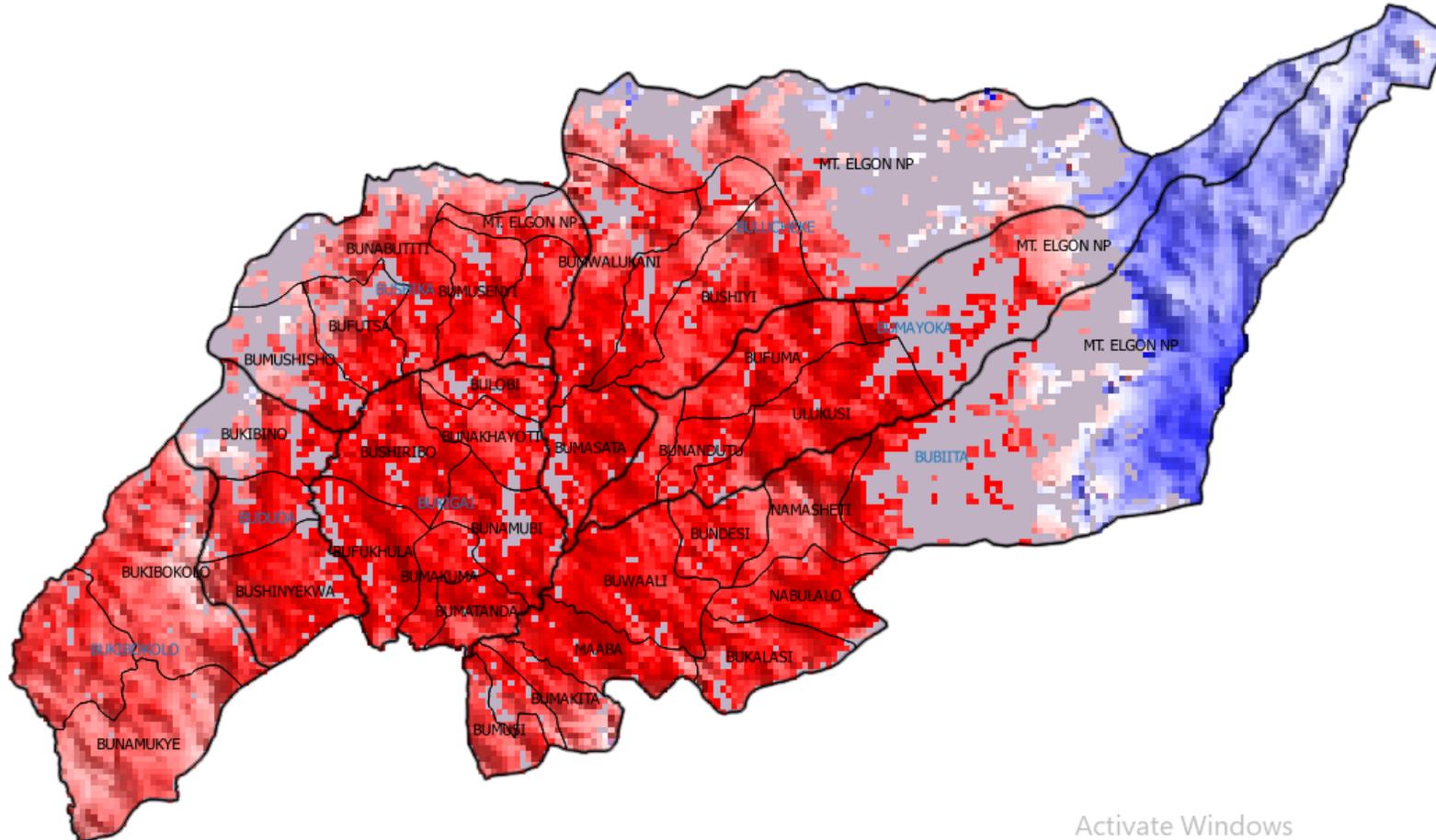
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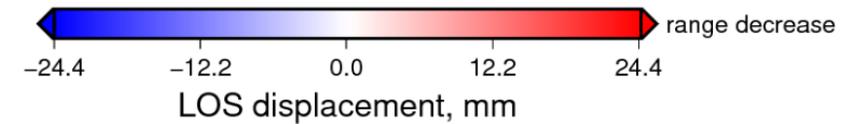
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Ground Deformation Measurement Patterns



24 Oct 2007 to 24 Jan 2008
4 months



Legend

- Bududa_District
- Bududa_Subcounties
- Bududa_Parishes
- Ground Deformation



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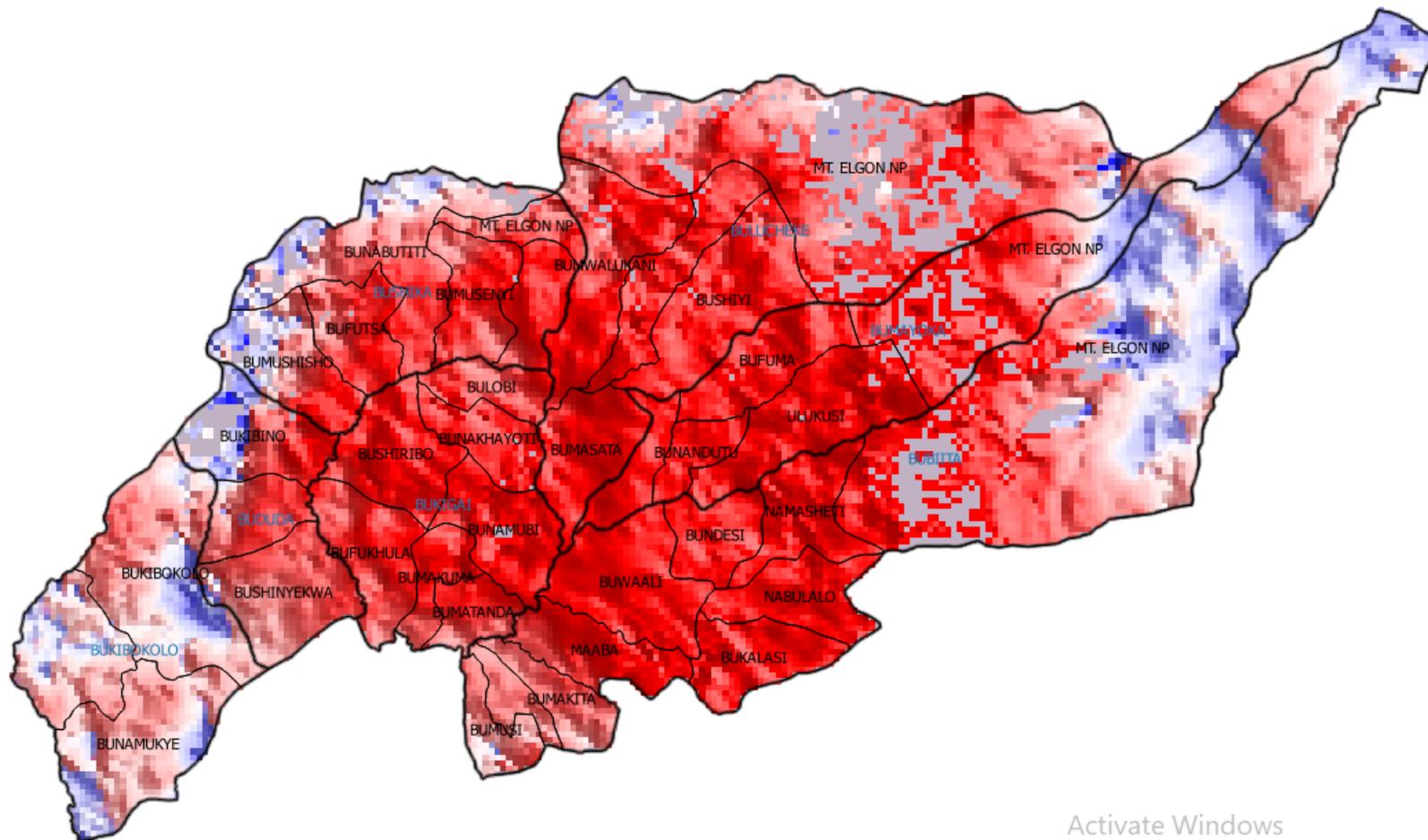
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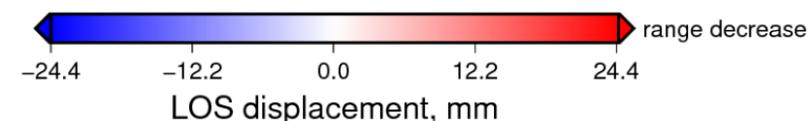
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Ground Deformation Measurement Patterns



9 Dec 2007 to 24 Jan 2008
2 months



Legend

- Bududa_District
- Bududa_Subcounties
- Bududa_Parishes
- Ground Deformation



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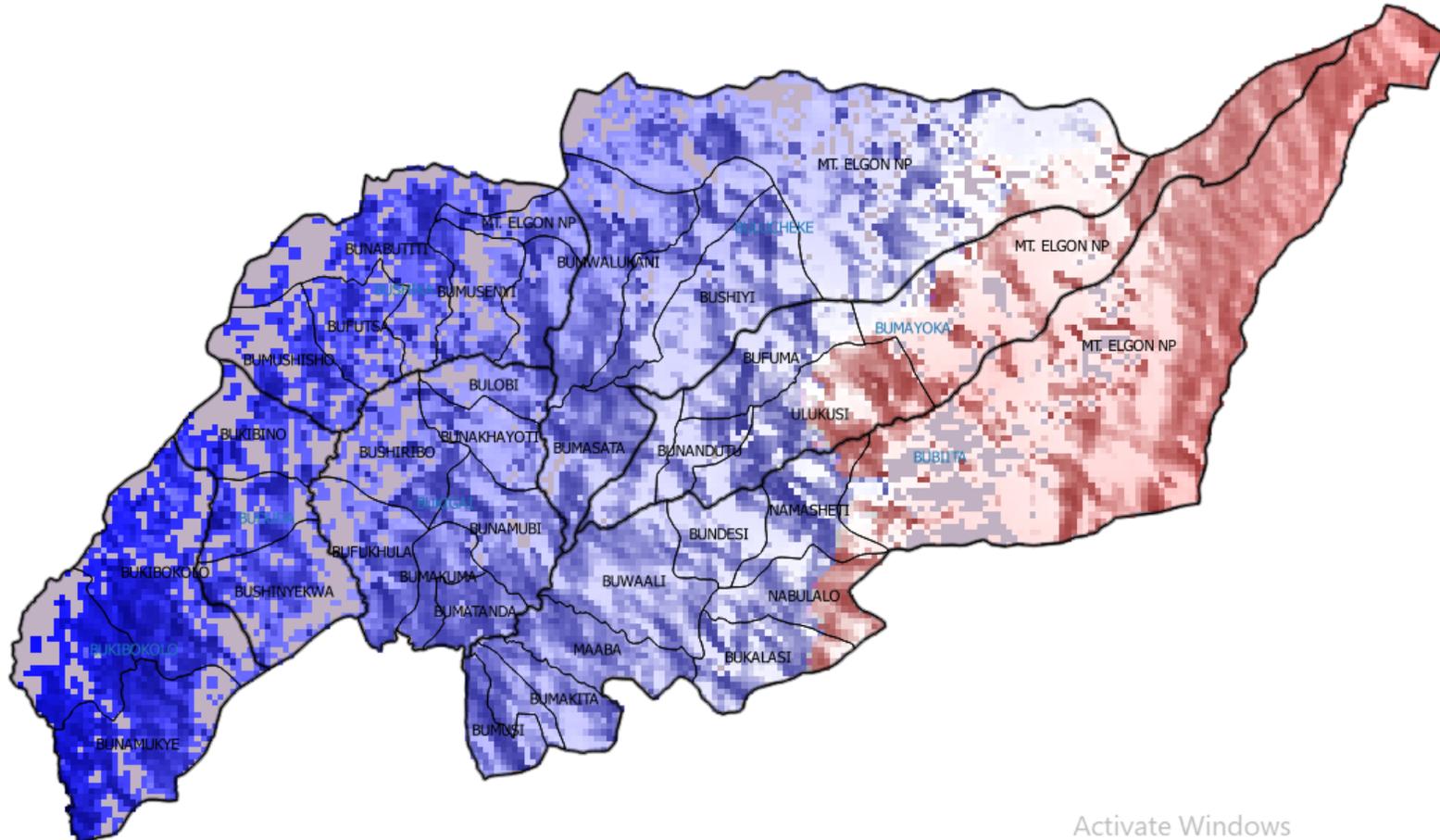
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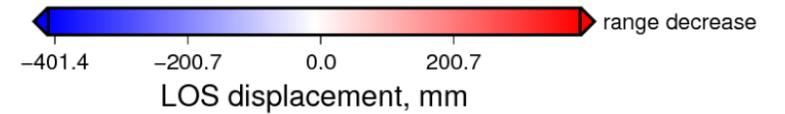
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Ground Deformation Measurement Patterns



24 Jan 2008 to 10 Mar 2008
1.5 Months



Legend

- Bududa_District
- Bududa_Subcounties
- Bududa_Parishes

Ground Deformation



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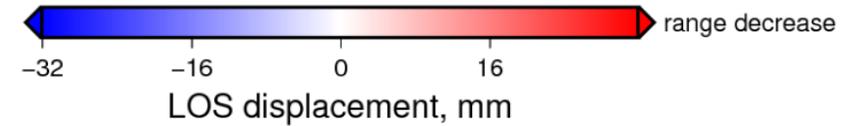
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Ground Deformation Measurement Patterns

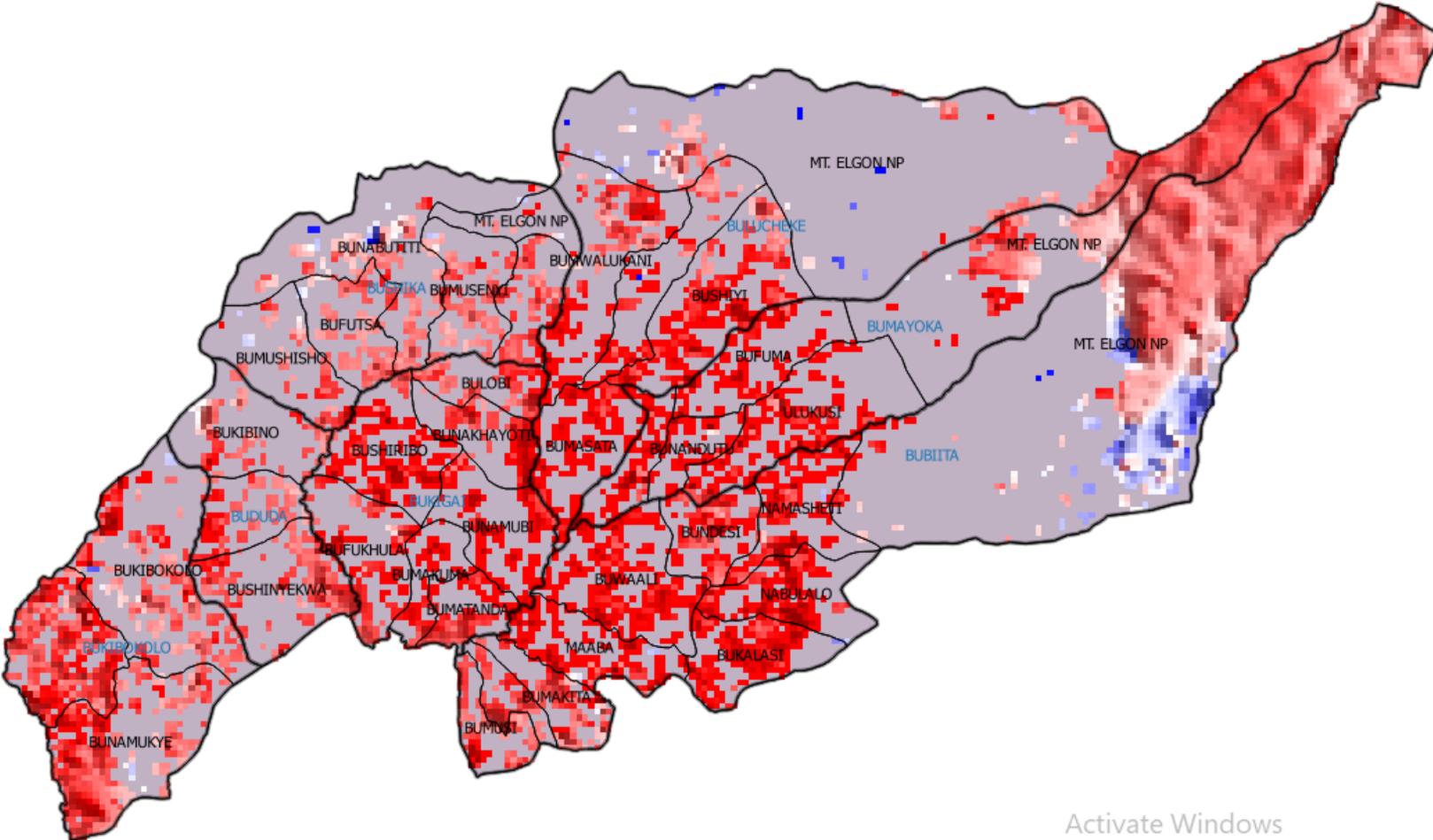
24 Jan 2008 to 25 Apr 2008
3 months



Legend

- Bududa_District
- Bududa_Subcounties
- Bududa_Parishes

Ground Deformation



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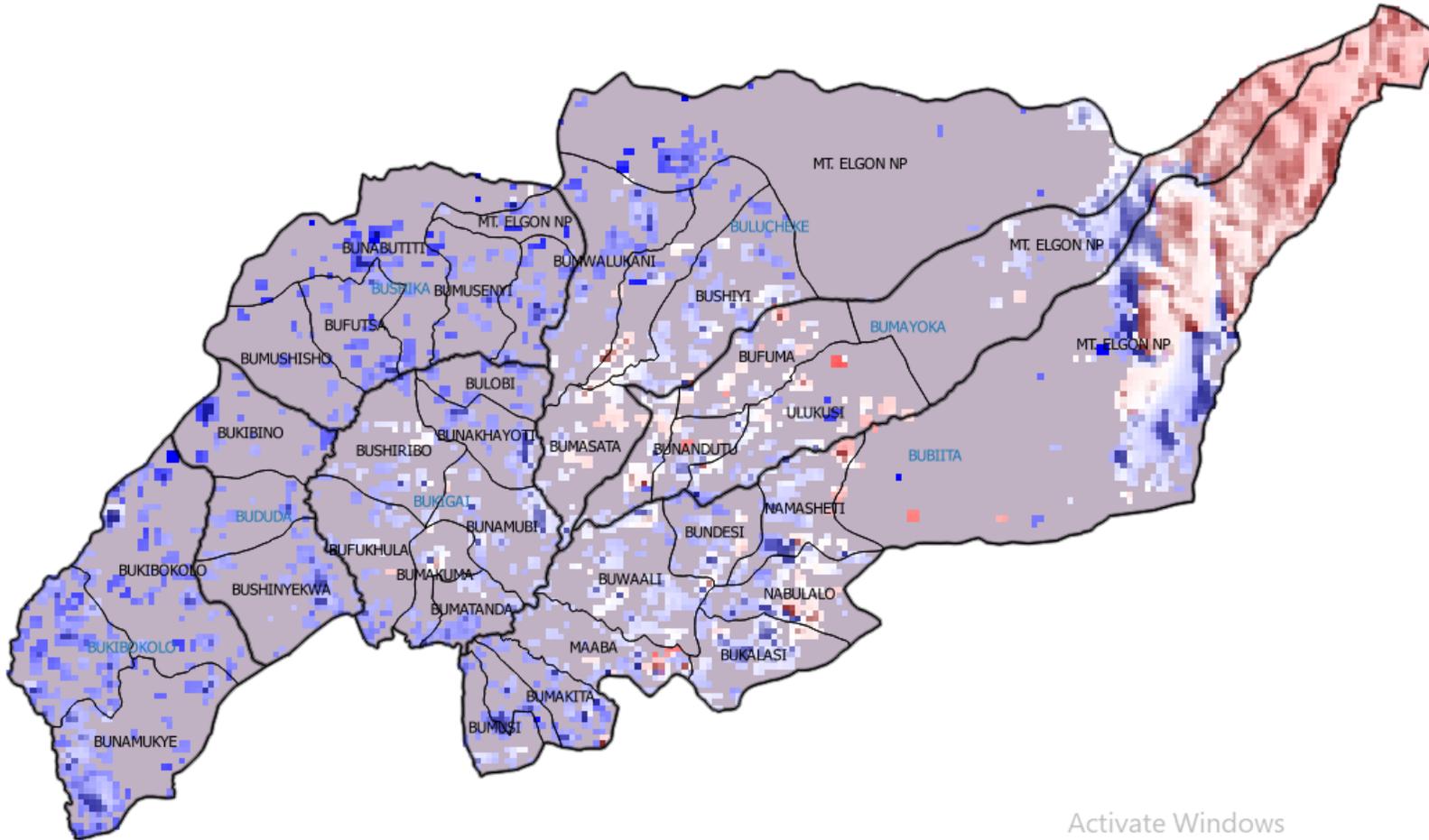
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Ground Deformation Measurement Patterns



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Ground Deformation Measurement

- Bududa generally experiences minor up lift during the last half (Sept to Jan) of the year while it experience down lift during the first half of the year (Jan to June). These patterns are not constant, they keep changing every year due to changing climatic and vegetation which makes it difficult to study.
- These deformations have been evidenced by a 40km crack running east of the District as determined by a geo-technical survey undertaken by the department of Geography, Geoinformatics and Climatic science at Makerere University in 2015.
- Mr John Nambeshe, as Member of Parliament for Majiia County, said soil movements were still happening in the district as evidenced by cracks in houses and soils in Bushiyi, Nametsi and Bumwalukani sub counties



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Resettlement

- ❑ Mr. John Nambeshe proposed people living in high risk areas to be resettled. Nametsi landslide victims were resettled in Kiryandongo and 2800 acres of land in Bunambutye Sub County, Bulambuli District to resettle people living in landslide prone areas in Bududa in 2003, but no further step has been taken to relocate the residents. **Why?**
- ❑ The Office of Prime Minister (OPM) Public Relations Officer, Mr. Julius Mucunguzi said as government, they had tried to relocate the people to safer areas but they end up returning. **Why?**
- ❑ Bududa has safe areas in the district as shown from deformation studies. Deformation rates are high in the first half of the year and reduce as the year closes. People in high risk areas could be relocated in such safe areas. The Bududa District LC5 Chairperson, Mr Wilson Watira, said recently President Museveni promised to compensate people living in higher risky areas to assist them to buy land in safer areas but nothing has been. **Why?**



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Conclusion - Deformation

Bududa District and most especially the higher altitudes of the eastern slopes of Elgon have significant deformation during the wet season most especially the long wet season in the first half of the year compared to the last half of the year. There are sub counties that are entirely deforming compared to other. These sub counties include Bukalasi and Bumayoka. Other sub counties have areas which are at high risk but at the same time they also have safe zones for example Bushika, Bududa and Bulucheke sub. Sub counties of Bukibokolo and Bukigai exhibit the most stability in Bududa district.



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Conclusion – Resettlement

□ Resettlement with in Bududa district is viable from deformation studies. Resettlement is possible in Bushika, Bududa, Bulucheke, Bukibokolo and most especially Bukigai. This will have political, social, economical and cultural buy in compared to resettling people in Kiryandongo or Bulambuli. Resettling all people at risk in Bududa faces a problem of high population density compared to available safe areas. Acquiring of safe areas requires compensation of holders. Land holders do not have documentation to land which will cause proof of ownership to be difficult. Registration of land rights could be done using fit for purpose tools before acquisition of land by government.



Thank You!



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