Cloud Computer and Web 2.0 Mapping Technologies for Disseminating Land Use Planning and Management Information

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INTRODUCTION

Open source software and cloud computing techniques could substantially improve the performance and reduce the cost of disseminating land planning and management information. The land use planning and management website developed for this paper utilizes software programs belonging to Open Geospatial Consortium (OGS), a non-profit, voluntary standards organization. The OGS tools (e.g., PostGIS, Geoserver, & GeoWebcache) allow the development of low-cost high-performance applications. The objective of this paper is to describe and demonstrate the use of these technologies for land use and management information dissemination.

MATERIALS AND METHODS

Soils data were downloaded from the NRCS Soil Data Access site and 100-year flood data was obtained from FEMA. They were stored in a PostGIS database and accessed by Geoserver, a OGS software converts that raw data into cartographic products. Since the Geoserver map products are large and would be delivered slowly across the internet, our application also utilizes GeoWebcache, which optimizes the maps for fast web delivery, and stores them on a server. We are developing a hybrid cloud architecture that utilizes the University of Kentucky's private cloud utilizing Dell PowerEdgeM610 servers (Figure 1).

RESULTS AND CONCLUSIONS

This paper builds on our previous work (Neelakantan, 2011). For the entire MLRA-121 area (includes over 30 counties in Kentucky, Ohio and Indiana, we created a proof-of-concept web go.uky.edu/LandUse). Users click on the map at any location; tabular data appear for that location in the lower right hand side of the web page. A screen shot from this website is shown in Figure 2. This includes NRCS land use interpretations for suitability with dwellings and FEMA floodplain maps and tabular data describing the soils and nitrogen fertilizer recommended rates. Our work suggests that an open-source, cloud computing

solution for dissemination of land use and management data will improve performance of web applications and the quality of output. Additionally, there could be substantial cost savings.
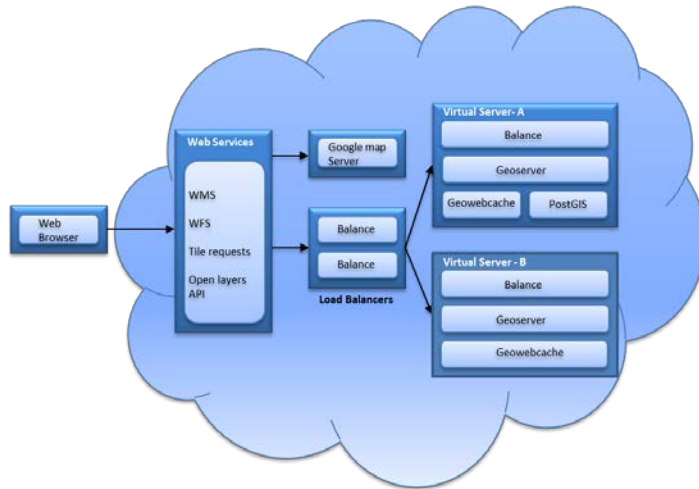

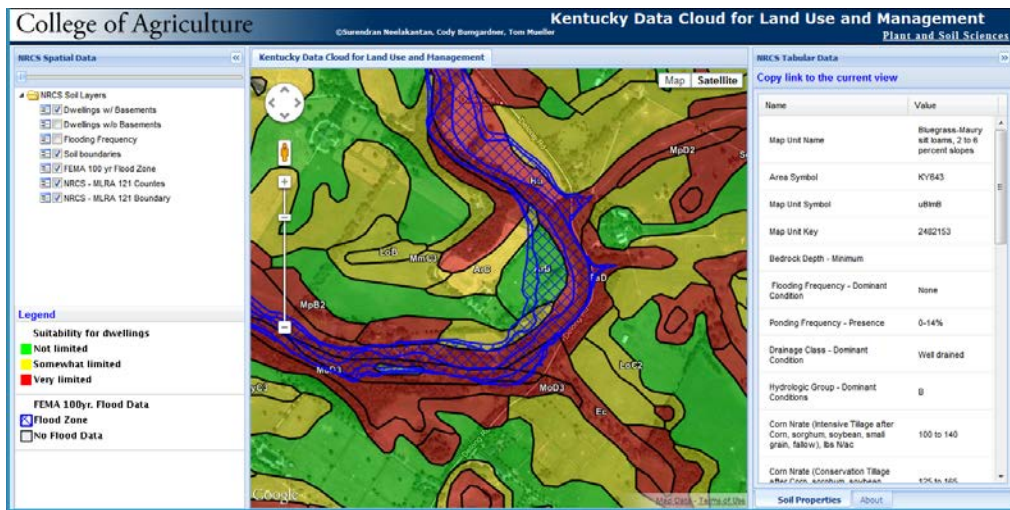Figure 1. Cloud based architecture for the land use planning site.

Figure 2. Screen shot from land use and management website.

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REFERENCES

Neelakantan, S., T.G. Mueller, B. Lee, B. Lee, P. Finnell, V. Bumgardner, and D. Carey. 2011. Web 2.0 spatial data browser for visualizing land-use assessment information from soil surveys. JSWCS. 66:37A-39A.