

Figure 5: Applying GIS analysis for watershed management purposes on cloud

### 2.3.5. Advantageous skills of Cloud GIS: Basemap functions

Cloud GIS technology provides huge GIS and remote sensing basemaps hosted on cloud. This is a fast and impressive advantage according to us because system enables suddenly jumping from one base map to another. Satellite images, street maps, National geographic maps are ready for usage (Figure 6). Besides this shared huge GIS datasets created by other cloud users are accessible for users of system.

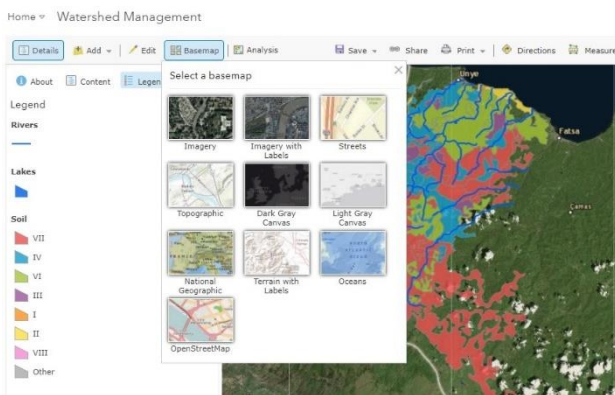


Figure 6: Basemap changing function of cloud systems

## 3. RESULTS & CONCLUSIONS

Watershed management approach is crucial approach for managing lands, saving environment and habitat. This study purposes to enable watershed management with cloud GIS based approach. Pre studies shown that working on cloud brings velocity and efficiency for GIS studies. First, we can get a huge set of cloud hosted GIS and Remote sensing database. Cloud based GIS layers are World topology, World hydrology etc. also cloud based remote sensing data are various satellite views, infrared band views, new and old imageries. Getting ready datasets brings velocity for projects besides this; we uploaded our own GIS datasets for working in Hybrid cloud model. Other side,

tested GIS analyses and queries gave efficient results. In terms of accuracy, there is no difference between Desktop and Cloud GIS when they are compared. This working model also enables easily data share between participants of project (Government staff, public sector, university staff and field workers). All the system is accessible with Internet browsers or mobile phones if sharing and discussing is relevant. Permissions on geodatabase can be identified according to user such as full access (view, download, change data) or limited access (just view). In future studies this study will be enriched with environmental care purposes such as protecting, generating fish habitats and other ecosystems.

## REFERENCES

- Bhat M.A., Shah R.M. and Ahmad B. 2011. Cloud Computing: A solution to Geographical Information Systems (GIS). *International Journal on Computer Science and Engineering (IJCSSE)*. Pages: 594-600
- Bediroglu, S., Yildirim, V. and Erbaş, Y.Ş., 2014. Application of GIS Analyzes with Cloud Computing. *FIG Congress 2014 Engaging the Challenges – Enhancing the Relevance Kuala Lumpur, Malaysia 16-21 June 2014*.
- Pinto, D., S. Shrestha, M. S. Babel and S. Ninsawat. 2017. "Delineation of groundwater potential zones in the Comoro watershed, Timor Leste using GIS, remote sensing and analytic hierarchy process (AHP) technique." *Applied Water Science* 7(1): 503-519.
- Musy, A. and Higy, C., 2009. *Hydrologie: Une science de la nature*. Ingénierie de l'Environnement, PPUR, 306 p.
- Reddy, V.R., Reddy, G. and Soussan, J., 2010. *Political Economy of Watershed Management: Policies, Institutions, Implementation and Livelihoods*, Rawat Publishers, Jaipur.
- Reddy, V.R., Saharat, Y.S. and George, B., 2017. Watershed management in South Asia: A synoptic review. *Journal of Hydrology*, Volume 551, 2017, Pages 4-13, ISSN 0022-1694.
- Russell, K.L., Vietz, G.J. and Fletcher, T.D., 2016. Global sediment yields from urban and urbanizing watersheds. *Earth-Sciences Reviews*.
- Romnée, A., Evrard, A. and Trachte, S., 2015. Methodology for a stormwater sensitive urban watershed design. *Journal of Hydrology*, 530, 87-102.
- Tiware, K., Roshan, M.B. and Bishal, K.S., 2008. Natural resource and watershed management in south Asia: a comparative evaluation with special references to Nepal. *J. Agric. Environ.*, 9.
- URL-1: <https://www.epa.gov/watershedacademy>. 25 Temmuz 2017.
- Zare, M., Panagopoulos, T. and Loures, L., 2017. Simulating the impacts of future land use change on soil erosion in the Kasilian watershed, Iran. *Land Use Policy*, 67, 558-572.