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GROUNDWATER STORAGE CHANGES IN THE HYDERABAD REGION USING GRACE SATELLITE GRAVITY DATA AND MAIRS DATA

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ABSTRACT:

Study region: Hyderabad region part of Telangana state, India
Study focus: Impact of Global warming has an effect on water resource management. Hence monitoring of changes in terrestrial water storage has become significantly important. From the combination of Gravity Recovery And Climate Experiment and Monsoon Asia Integrated Regional Study data the changes of Terrestrial water storage in Hyderabad region has been found from January 2009 to December 2014. In this paper we use Gravity Recovery And Climate Experiment monthly gravity data to track water storage change from January 2009 to December 2014.
The main theme of the work is to use Gravity Recovery and Climate Experiment data set to see ground water storage levels and its changes in Hyderabad region and to do water balance analysis using GIS and RS techniques which is obtained by
i) Time series comparisons of satellite data over field based data in same spatial scale at various temporal cycles.
ii) Generation of GIS maps with ground water levels between 2009 to 2014.
In Hyderabad region it is found that

i) Average ground water depletion is 0.61 per year from 2009-14.
ii) Average recharge rate of ground water from pre to post monsoon is 17.3203 kg/cm^3.But in 2014 it is 9.623 kg/cm^3 i.e. recharge rate is decreased.
iii) The water potential is less than 1 kg/cm^3, below ground water levels occupied 73.96 $sqkm^2$ i.e. 66.66% of study area. Hence it is predicted that study area is falling under low ground water potential.

KEYWORDS: Gravity Recovery And Climate Experiment (GRACE), Monsoon Asia Integrated Regional Study (MAIRS), Ground water storage (GWS), Total water storage, Terrestrial water storage, GIS.

References:

[1]. Deepesh Machiwala, MadanK.Jha. (2015) "Identifying sources of groundwater contamination in a hard-rock aquifer system using multivariate statistical analyses and GIS-based geostatistical modeling techniques"

[2].Elzie M. Velascoa, Jason J. Gurdaka,, Jesse E. Dickinsonb, T.P.A. Ferréc, ClaudiaR.

Corona.(2015) “Interannual to multidecadal climate forcings on groundwaterresources of the U.S. West Coast”.

[3].Frank Herrmann, Luise Keller, Ralf Kunkel, Harry Vereecken, Frank Wendland. (2015) “Determination of spatially differentiated water balancecomponents including groundwater recharge on the FederalState level – A case study using the mGROWA model in NorthRhine-Westphalia (Germany)”.

[4].Gilles Drogue, Wiem Ben Khediri.(2016) “Catchment model regionalization approach based on spatialproximity: Does a neighbor catchment-based rainfall inputstrengthen the method”.

[5].LongweiXianga,b, HanshengWanga, HolgerSteffenc, PatrickWud, LuluJiae, LimingJianga, QiangShena (2016) “Groundwater storage changes in the Tibetan Plateau and adjacent areas revealed from GRACE satellite gravity data” .

[6]. Nadia Babiker Ibrahim.Shakak (2015) “integration of remote sensing and gis in ground water qualityassessment and management”.

[7]. N. Tangdamrongsub , P.G. Ditmar , S.C. Steele-Dunne , B.C. Gunter , E.H. Sutanudjaja (2016) “Assessing total water storage and identifying flood events over Tonlé Sap basin in Cambodia using GRACE and MODIS satellite observations combined with hydrological models”.

[8]. Wang Hanshenga, Xiang Longweia,b, Jia Luluc, Wu Patrickd,Steffen Holgere, Jiang Liminga, Shen Qianga (2015) “WaterStorage changes in North America .retrieved from GRACE gravity and GPS data”.

[9]. Zhao Qiana, Wu Weiweia,b, Wu Yunlongc(2015) “Variations in China's terrestrial water storage over the past decade using GRACE data”.