South-to-north water diversion energy storage

Moreover, the impact of the south-to-north water-diversion (SNWD) project on alleviating the water-storage deficit was quantified. The results revealed that the water-balance method on the strength of the combination of CMA precipitation and Noahv2.1-simulated evapotranspiration and runoff data matches well with the TWSA data derived from GRACE ...

transferred water will replace about 2.97 billion m3 of exploited groundwater in the water reception area by 2020 and hence reduce energy consumption by 931 million kWh. Further, by 2030, 6.44

The South-to-North Water Diversion (SNWD) is a multi-decadal infrastructure project in China aimed at alleviating severe water shortages in north China. It has imposed broad social, economic, environmental, and ecological impacts since 2015, particularly in the Beijing-Tianjin metropolitan area. Sentinel-1A/B Interferometric Synthetic Aperture Radar (InSAR) ...

The South-to-North water diversion Middle Route Project (MRP) is expected to alleviate the long-term groundwater storage (GWS) depletion in North China Plain (NCP) after the beginning of its ...

As a major grain-producing region in China, the North China Plain (NCP) faces serious challenges such as water shortage and land subsidence. In late 2014, the Central Route of the South-to-North Water Diversion Project (SNWD-C) began to provide NCP with water resources. However, the effectiveness of this supply in mitigating land subsidence remains a ...

Inter-basin water transfer (IBWT) projects are an effective means of addressing regional water resource imbalances. However, owing to the long construction cycle, large investment amount, and wide impact range, water diversion projects exhibit delayed and complex benefits, often lacking clear comprehension. In this study, we established a multi-regional ...

The South-to-North Water Diversion Project (SNWDP) is believed to drive the next phase of sustainable productivity growth, meeting growing water demand, so as to address increasing environmental sustainability challenges. The Middle Route of SNWDP is regarded as an extremely large long-distance inter-basin water diversion project, which has benefited ...

The gravity recovery and climate experiment (GRACE) and its Follow-On mission provide a versatile tool for monitoring groundwater depletion in North China Plain (NCP). However, intermittent data gaps and inherent coarse spatial resolution have restricted the continuous detection of regional groundwater storage anomaly (GWSA) after 2014, the period ...

The South-to-North Water Diversion (SNWD) provides significant benefits in facilitating water security and improving ecology in northern China. However, few studies have estimated the water value of the SNWD and

the corresponding subsequent subsidies of the ecological migrants in Xichuan County displaced by the project. Based on the Google Earth ...

1 Introduction. The North China Plain (NCP) is among the largest grain producing regions in China, featuring high water demand, extremely dense population, a relatively dry climate (mean annual precipitation ~500 mm/yr, 2000-2018) and limited water resources (less than 500 m 3 /yr per capita) (Liu et al., 2008).As a result, groundwater in the NCP has been ...

The water-receiving area of the South-to-North Water Diversion Eastern Route Project (SNWDP-ER) is one of the most severely affected water-shortage areas in China, and no previous study has been conducted on the changes in water storage in this area. In this study, we combined the latest Gravity Recovery and Climate Experiment (GRACE) And GRACE ...

In order to improve the water delivery capacity of the middle route of the South-to-North Water Diversion Project in winter, the technology of pumping well water to melt ice was previously adopted to improve the water temperature of the channel. In order to protect the local ecology and channel water quality during the process of pumping and recharging, this paper ...

The South-to-North Water Diversion Project targets water shortage in China"s northern areas, particularly in the drainage basins of the Yellow River, the Huaihe River, and the Haihe River, which in 2002 had a total population of 438 million. ... 3.3 billion cubic meters of storage capacity was added, which with the coordination of flood control ...

To relieve the severe water scarcity in the upper and middle regions of the YERB, the western route of the South-to-North water diversion project (SNWD-W) has been presented ...

The Middle Route of the South-to-North Water Diversion Project is a critical infrastructure that ensures optimal water resource distribution across river basins and safeguards the livelihood of people in China. This study investigated its effects on the land surface temperature (LST) and fractional vegetation coverage (FVC) in the Danjiang River Basin. ...

Consequently, water diversion projects have been implemented globally in recent decades to meet the ever-growing water demands of humanity (Liu et al., 2013). For example, China has implemented the world"s largest water diversion project, the South-to-North Water Diversion Project (SNWDP), to alleviate water shortages in northern China.

This work selects the largest water-transfer project in China, the South-to-North Water Diversion (SNWD) Project, to critically review its eco-environmental impacts on donor ...

Therefore, a large number of researchers have studied the prevention and control of water pollution incidents

(Long et al., 2019), the tracing of pollutants (Zhang, 2011; Fan et al., 2015), and water quantity control of the South-to-North Water Diversion Projects in the glacial period (Bo et al., 2022).

The energy and greenhouse gas-related environmental co-benefits of the South-to-North Water Diversion Project (SNWDP) are highlighted and the energy-saving effect of SNWDP on groundwater exploitation based on the groundwater-exploitation reduction program implemented by the Chinese government is evaluated. The North China Plain, with a ...

The South-to-North Water Diversion Project Central Route (SNWDP-CR) is the largest water control project which has ever been built, and the aim of which is to optimize the reallocation of water resources from South China to North China. Since it was put into operation in December 2014, it has delivered more than 6 × 109 m3 of water to Beijing, which has changed ...

Global freshwaters are severely depleted. Provision of improved water infrastructure technologies and innovation can address challenges posed by water shortages to environmental sustainability. China"s South-to-North Water Diversion Project has generated extensive debates over sustainability of water resources system in the northern drier region, ...

Article impact statement: Continuous downscaled GRACE data detects groundwater storage variation in North China Plain after south-to-north water diversion in 2014. Abstract The gravity recovery and climate experiment (GRACE) and its Follow-On mission provide a versatile tool for monitoring groundwater depletion in North China Plain (NCP).

The Danjiangkou Reservoir (DJKR) serves as the water source for the world"s biggest water diversion project, the Middle Route of the South-to-North Water Diversion Project (MR-SNWDP) in China, and this project concerns the water security of tens of millions of people in northern China. Hence, the maintenance of ecosystem health and optimization of management ...

SNWD routes, water storage, and precipitation in Beijing a Central (SNWD-C, light blue line) and eastern (SNWD-E, dark blue line) routes of the SNWD (South-to-North Water Diversion), capitals of ...

The South-to-North Water Diversion (SNWD) is a mega water infrastructure project that aims to alleviate the water shortage in northern China and promote regional sustainable development. To quantitatively evaluates the structure changes and driving factors of water consumption in the four provinces along the middle route project of SNWD (MRP ...

Key Points. South-to-North Water Diversion Eastern Route Project (SNWDP-ER) aids in the recovery of nongroundwater (9.44 ± 1.65 mm/yr) in the water-receiving area. ...

Abstract. Inter-basin water transfer projects are the main measure to address the water deficit crisis caused by

uneven distribution of water resources. The current water transfer operation mainly tends to be present in areas with small water transfer costs and is prone to encounter the problem of spatial and temporal imbalances in water allocation. To address ...

Water scarcity is a significant challenge in China, and the South-to-North Water Diversion Project (SNWDP) aims to address the water deficit in the northern region. This study analyses Landsat 5/7/8 remote sensing imagery from 2001 to 2020 on the Google Earth Engine (GEE) cloud platform to assess the impact of the SNWDP on surface water bodies in water ...