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Hidrološki letopis Slovenije 2007

The 2007 Hydrological Yearbook
of Slovenia



HIDROLOŠKI LETOPIS SLOVENIJE 2007

THE 2007 HYDROLOGICAL YEARBOOK OF SLOVENIA

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PREDGOVOR

Iz leta v leto pripravljamo vsebinsko dopolnjen hidrološki letopis z dodatnimi strokovnimi in analitičnimi vsebinami, s katerimi zaokrožujemo področja dela na sektorjih, ki pokrivajo naloge državne hidrološke službe na Agenciji Republike Slovenije za okolje (ARSO). Naš namen je, da javnosti poleg pregleda hidroloških razmer obravnavanega leta ponudimo vsebine s področja razvoja dejavnosti hidrologije na agenciji in modernizacije merilnih mest ter predstavimo rezultate analitičnega dela. Vsebinsko letopisa želimo čim bolj približati širši javnosti, hkrati pa ohraniti namen letopisa, to je objava podatkov in pregled hidroloških razmer v obravnavanem letu.

Leto 2007 se bo v zgodovino Slovenije zapisalo predvsem zaradi uničujoče moči narave. Hudourniške poplave so 18. septembra na območju severozahodne in severne Slovenije povzročile ogromno materialno škodo, ki je bila ocenjena na več kakor 200 milijonov evrov, v teh poplavah pa je izgubilo življenje šest ljudi. Najbolj prizadeta je bila dolina Selške Sore, kamor je prišla poplavni dogodek proučeval mednarodna skupina strokovnjakov v okviru evropskega projekta Hydrate. Izvedli so postanalizo dogodka in ocenili katastrofalni pretok Selške Sore v Železnikih in prispevka pritokov. Pri tem smo sodelovali tudi hidrologi ARSO.

Tudi drugod po svetu (v Boliviji, Argentini, Urugvaju, Mehiki, Indoneziji, afriških in azijskih državah, Veliki Britaniji in na severu Evrope) so v letu 2007 poplave in huda neurja prizadeli ljudi ter uničili pridelke in domove, marsikje pa tudi zahtevali človeška življenja. Po drugi strani pa je vladala v zahodnih delih ZDA, Avstraliji in na Kitajskem izrazita suša. Povprečna svetovna temperatura zemeljskega površja je bila za 0,41 °C nad dolgoletnim povprečjem. Obseg morskega ledu na Arktiki se je zmanjšal in dosegel najmanjši obseg dotlej, morska gladina pa se je še naprej dvigovala.

V Sloveniji je bila leta 2007 povprečna temperatura povsod nad dolgoletnim povprečjem. V osrednji Sloveniji ter v vzhodni in severovzhodni Sloveniji razen Goriškega je bilo leto 2007 več kakor 2 °C toplejše kakor v dolgoletnem povprečju. Drugod je bil temperaturni odklon med 1 in 2 °C. Zelo visoke temperature, krepko nad 30 °C, so bile zabeležene med julijskim vročinskim valom. Hudega mraza v letu 2007 ni bilo. V večjem delu Slovenije je padlo manj padavin od dolgoletnega povprečja, večinoma med 80 in 100 % dolgoletnega povprečja. Najbolj namočena sta bila februar in september, ki sta tudi najbolj presešla dolgoletno povprečje padavin, vsi preostali meseci pa so bili podpovprečno namočeni.

FOREWORD

Year by year the contents of hydrological yearbook is updated with additional expert and analytical topics that connect the different areas of work in the various sectors dealing with the tasks of the national hydrological service at the Environmental Agency of the Republic of Slovenia (EARS). In addition to a review of hydrological conditions in the observed year, our purpose is to offer topics in the field of hydrological activity development at the Agency and the modernisation of gauging stations and to present the results of analytical work to the general public. We want to bring the content of the yearbook closer to the general public as much as possible while maintaining its purpose, i.e. to publish data and review hydrological conditions in the observed year.

In the history of Slovenia, the year 2007 will be remembered in particular for nature's destructive power. On 18 September, torrential floods in the north-western and northern parts of Slovenia caused substantial material damage estimated at over 200 million Euros and killed six people. The most affected area was the Selška Sora Valley, where an international group of experts within the framework of the Hydrate European project arrived to study the flood. They performed a post-event analysis and assessed the catastrophic discharge of the Selška Sora River in Železniki and the contribution of its tributaries. The hydrologists from the EARS participated as well.

In 2007, floods and severe thunderstorms across the world (in Bolivia, Argentine, Uruguay, Mexico, Indonesia, African and Asian countries, Great Britain and northern Europe) affected people and destroyed crops and homes, and in some places even caused the loss of human life. On the other hand, extreme drought affected the western parts of the USA, Canada and China. The average temperature of the Earth's surface exceeded the multi-annual average by 0.41 °C. The extent of the Arctic Sea ice had reduced and achieved the minimum extent thus far, while the sea level kept rising.

In Slovenia, the average temperature in 2007 was above the multi-annual average everywhere. In central Slovenia as well as in eastern and north-eastern Slovenia, with the exception of Goričko, the year 2007 was warmer than the multi-annual average by over 2 °C. Elsewhere, the temperature deviation was between 1 and 2 °C. Very high temperatures, well above 30 °C, were recorded during the July heat wave. There was no severe cold in 2007. In most parts of Slovenia, the precipitation level was below the multi-annual average, mostly between 80 and 100% of the multi-annual average. February and September were the wettest months which also exceeded the multi-annual

Kot posledica podnebnih razmer so bili pretoki večino leta manjši od običajnih pretokov. Bolj vodnati kakor navadno so bili le februar, marec in september, pomanjkanje vode pa je bilo najbolj občutiti v juliju in avgustu v pretežnem delu države. Kljub daljšim hidrološko suhim obdobjem pa poglobljene hidrološke suše ni bilo občutiti, saj so občasne lokalne padavine preprečevale izredna sušna stanja. V aluvialnih vodonosnikih po Sloveniji je prevladovalo nizko in običajno stanje zalog podzemnih vod. Po podatkih vodne bilance je bilo leta 2007 v Sloveniji v primerjavi z referenčnim obdobjem 1971–2000 padavin manj za 10 %, izhlapevanja je bilo več za 15 %, odtok pa je bil manjši kar za 31 %.

Morje je bilo v letu 2007 zelo visoko. Srednja letna višina morja je bila podobno kakor leto pred tem ena od najvišjih srednjih letnih višin v obdobju opazovanj. Morje je večkrat presešlo opozorilno vrednost in poplavilo nižje dele obale.

Obdelava podatkov za leto 2007 je bila izvedena še v sistemu za shranjevanje in obdelavo hidroloških podatkov (SSOHP), ki je v sedanjih obliki tekkel od leta 1994 v operacijskem sistemu VMS na računalniku MicroVAX. Obdelava hidroloških podatkov za leto 2008 že teče v novem hidrološkem informacijskem sistemu HIDROLOG, ki je zasnovan kot spletna aplikacija z grafično podporo, zasnovana na enotnem podatkovnem modelu, v katerem so združeni podsistemi za površinske in podzemne vode, izvire in morje. V relacijsko podatkovno bazo sistema HIDROLOG so že prepisani arhivski hidrološki podatki. Uporabnikom hidroloških podatkov bomo tako omogočili učinkovitejši dostop do podatkov, tudi prek spletne strani agencije (<http://www.arso.gov.si/vode/podatki/>). Prvič letopisu prilagamo tudi zgoščenko z vsebino letopisa in srednjimi dnevnimi podatki za leto 2007 vseh delujočih vodomernih postaj.

Pred vami je nova, na zunaj prenovljena številka hidrološkega letopisa. Nova zunanja podoba publikacije je v skladu s celotno grafično podobo državne uprave, ki se je za enoten izgled odločila v letu 2010, ko je bila ta številka hidrološkega letopisa natisnjena.

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average, while the other months were below-average in terms of the levels of precipitation.

As a result of climatic conditions, discharges were lower than normal for most of the year. February, March and September experienced more discharges than usual, and the shortage of water was felt the most in July and August in most parts of the country. Despite longer hydrologically dry periods, no extreme hydrological drought was felt because occasional local precipitation prevented extremely dry conditions. In alluvial aquifers in Slovenia, groundwater reserves were mostly low or normal. According to the water balance data, Slovenia recorded 10% less precipitation in 2007 compared to the reference period 1971-2000, evaporation increased by 15%, whereas discharge was lower by 31%.

The sea level in 2007 was very high. As was the case the year before, the mean annual sea level was among the highest in the observation period. The sea level exceeded the threshold value and flooded the lowest parts of the coast.

Data processing for 2007 was performed in the hydrological data storing and processing system (SSOHP) which has been running in its current form since 1994 in the VMS operating system on the MicroVAX computer. Hydrological data processing for 2008 is already being performed in the new HIDROLOG hydrological information system, designed as a web application with graphic support on a uniform data model, combining all subsystems for surface and underground waters, springs and seas. The archival hydrological data were already transcribed to the relational database of the HIDROLOG system. Thus, a more efficient access to the data will also be provided to the users of hydrological data via the Agency's website (<http://www.arso.gov.si/vode/podatki/>). For the first time, a CD with the yearbook's content and mean daily data for 2007 of all operational water gauging stations will be enclosed in the yearbook as well.

There is a new and renovated on the outside issue of Hydrological Yearbook. The new configuration of the publication is in line with the state administration's integrated graphic image, which has a uniform look decided in 2010, when this issue of Hydrological Yearbook was printed.

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