

Vodna bilanca obdobja 1971–2000

The Water Balance for the 1971–2000 Period

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Velika pestrost v razporeditvi **padavin** na tako majhnem območju, kot je Slovenija, je znana le redkokje v svetu.

Povprečna letna količina padavin v hidrometričnih zaledjih v obdobju 1971–2000 je bila v Sloveniji 1628 mm. Razmerje med najmanj in najbolj namočenim hidrometričnim zaledjem je 1 : 3,75. Povprečna letna količina padavin izračunana iz hidrometričnih zaledji je 1628 mm. Ker HMZ ne prekrivajo celotne Slovenije, ponekod pa segajo preko državne meje, je povprečje za Slovenijo nekoliko drugačno – 1579 mm.

Najbolj namočeni so bili predeli v zahodnem in osrednjem delu Julijskih Alp. V povirnih predelih Nadiže, Učje, Koritnice, Soče, Tolminke, Bače, Save Bohinjke in mojstranške Bistrice je padlo preko 2500 mm letno. Najbolj namočeni so predeli orografskih pregrad na južnem obrobju Julijcev, kjer količina padavin preseže tudi 3000 mm letno (porečja Tolminke, Učje in Nadiže).

Preko 2000 mm padavin letno pade v širokem pasu preostalih Julijskih Alp z zahodnimi Karavankami (povirje Save Dolinke) in predalpskega hribovja vse od Tolminskega, preko Cerkljansko-Idrijskega hribovja do Banjšice, Trnovskega gozda in Nanosa. Visoke količine padavin ima tudi Snežnik ter povirje Kolpe s Čabranko.

Med 1800 in 2000 mm padavin letno imajo porečja v Kamniških Alpah (od Tržiške Bistrice do Lučnice), spodnja dela porečij obeh Sor, porečje kraške Ljubljani z Nanoščico, zgornji del Vipavske doline ter Goriška brda.

Manj kot 1800 in nad 1600 mm padavin letno pade v osrednji Vipavski dolini (porečje Vipave, Branice itd.), v porečjih Reke in Rižane, v srednjem delu porečja Kolpe, v povirju Višnjice, v Krimskem hribovju (Borovniščica, Cerkniščica, Iška), v porečju Gradaščice ter srednjem delu Ljubljanske kotline (Kranjsko in Sorško polje). Podobno količino padavin imajo tudi srednja Savinja od Nazarij do Solčave ter Dreta in povirje Meže.

The great diversity in the distribution of **precipitation** within an area as small as Slovenia is rare across the world. The variation in the quantities of precipitation is reflected in the ratio between the least and most water-abundant hydrometric catchment areas – 1 : 3.75. The average annual quantity of precipitation in hydrometric catchment areas in the 1971–2000 period was 1628 mm in Slovenia. Because the area of the hydrometric catchment areas is not equal to the national territory the quantity of precipitation is slightly different: 1579 mm.

The most water-abundant are the areas in the western and central parts of the Julian Alps. In the headwater areas of the Nadiža, Učja, Koritnica, Soča, Tolminka, Bača, Sava Bohinjka and the Bistrica in Mojstrana, there was in excess of 2500 mm of precipitation annually. The most water-abundant were the areas of the orographic barriers on the southern edge of the Julian Alps, where the quantity of precipitation can even exceed 3000 mm per year (the river basins of the Tolminka, Učja and Nadiža).

In excess of 2000 mm of precipitation falls annually over a wide belt of the remaining Julian Alps, the western Karavanke Mountains (the headwaters of the Sava Dolinka) and in the pre-Alpine hills up to Tolminsko, over the Cerkljansko-Idrijsko hribovje hills to Banjšice, Trnovski gozd and Nanos. Large quantities of precipitation are also found in the catchment area of Mount Snežnik and the headwaters of the Kolpa with Čabranka.

The annual precipitation amounts between 1800 and 2000 mm are exhibited by the river basins in the Kamniške Alps (from Tržiška Bistrica to Lučnica), the lower parts of the river basins of both the Sora rivers, the river basin of the karstic Ljubljana River with the Nanoščica, the upper part of the Vipava Valley and the Goriška brda.

Between 1600 and 1800 mm of precipitation falls annually in the central Vipava Valley (the



BLAŽ KOŠAK

Slika 68: Dobrava pri Škocjanu

Figure 68: Dobrava near Škocjan

Območje s povprečno letno količino padavin med 1400 in 1600 mm je v srednji Sloveniji. Segra od srednjega in zgornjega dela porečja Krke preko barjanske Ljubljance, Save med Litiijo in Mednim s Pšato, Račo in Nevljico do porečja Drete in dela Savinje. Tudi porečja s povirji na Pohorju spadajo v ta razred.

Največji del hidrometričnih zaledij v Sloveniji ima letno med 1200 in 1400 mm padavin. To je pas, ki sega od Kolpe na jugu do Drave na severu. Tu je ves spodnji del Kolpe, Krke, Savinje in Save; tu so porečja spodnje Meže in celotne Mislinje, Pake, Dravinje, Mestinjščice ter zgornji del porečja Sotle.

Porečji Pesnice ter spodnji del porečja Sotle imata med 1000 in 1200 mm padavin letno, pod 1000 mm padavin pa ima Pomurje, najmanj predeli hidrometričnega zaledja Čentibe, ki obsega večinoma ravninski del Prekmurja.

Prostorska razporeditev količin izhlapevanja po Sloveniji kaže obratno sliko razporeditvi padavin in odtoka. Kjer je več padavin in odtoka je ponavadi manj izhlapevanja. Prav ta ima izmed vseh treh osnovnih elementov vodnega kroga najmanjšo spremenljivost v Sloveniji. Razmerje med hidrometričnim zaledjem z največ in najmanj izhlapevanja je bilo v Sloveniji v obdobju 1971–2000 le 1 : 1,2.

Manj kot 675 mm vode v povprečju izhlapi v povirjih Soče in Save, v porečju Nanoščice ter v posameznih delih porečij SV Slovenije. V preostalem delu Alp, vrhov Pohorja, Kozjanskega, v Slovenskih goricah ter srednjem Prekmurju izhlapi med 675 in 700 mm vode na leto. V osrednjem in vzhodnejšem delu Slovenije imamo do 725 mm izhlapevanja letno, južnejši in zahodnejši pa do 750 mm. Največ vode v Sloveniji izhlapi iz porečja Nadiže, Idrije, Branice, Močilnika, Dragonje in Borovniščice ter povirja Sotle in vsega porečja Kolpe ter Radešce.

Razporeditev odtočnih značilnosti je zelo podobna razporeditvi padavin. Največji odtoki

river basin of the Vipava, Branica, etc.), in the river basins of the Reka and Rižana rivers, in the central part of the Kolpa river basin, in the headwaters of the Višnjica, in the Krim highlands (Borovniščica, Cerknjščica, Iška), in the river basin of Gradaščica and in the central part of the Ljubljana Basin (Kranjsko and Sorško polje lowland). A similar quantity of precipitation is also exhibited by the central Savinja from Nazarje to Solčava, Dreta and the headwaters of the Meža river basin.

The belt of hydrometrical catchment areas with an average annual quantity of precipitation of between 1400 and 1600 mm lies in central Slovenia. It reaches all the way up to the central and upper parts of the Krka river basin, via the Ljubljana on the Ljubljana Marshes, the Sava between Litiija and Medno with Pšata, Rača and Nevljica to the Dreta river basin and a part of the Savinja. The river basins with headwaters in Pohorje also belong to this class.

The majority of the hydrometric catchment areas in Slovenia experience between 1200 and 1400 mm of precipitation a year. This is a belt stretching from the Kolpa River in the south through to the Drava River in the north. This area covers the entire lower part of the Kolpa, Krka, Savinja and Sava; the lower part of river basins of the Meža River and the entire Mislinja, Paka, Dravinja and Mestinjščica rivers as well as the upper part of the Sotla river basin.

The river basins of the Pesnica and lower part of Sotla river basin receive between 1000 and 1200 mm of precipitation a year, while precipitation below 1000 mm is exhibited in Pomurje. The least precipitation occurs in parts of the hydrometric catchment area of the Ledava Čentiba, which primarily encompasses the lowland part of Prekmurje.

The spatial distribution of **evaporation** across Slovenia shows a »reverse« picture of the distribution of precipitation and runoff. Where the precipitation and runoff are larger, the evaporation is usually smaller. Among the three basic elements of the water cycle, it is evaporation that exhibits the smallest variation. The ratio between the hydrometric catchment areas with the least and the most evaporation was only 1 : 1.2 in the 1971–2000 period.

Less than 675 mm of water evaporate on average in the headwaters of the Soča and Sava rivers, in the Nanoščica river basin and in individual areas of the river basins of south-eastern Slovenia. In the remaining parts of the Alps, the pinnacles of Pohorje, in Kozjansko, in the Slovenske gorice and in central Prekmurje, between 675 and 700 mm of water evaporate annually. In the central and eastern parts of Slovenia, up to 725 mm of water evaporate annually, while

so v Alpah, odtod pa se količina odtoka manjša proti jugu in vzhodu.

Bilančna neskladnost

Bilančno neskladje je pokazatelj metričnih ali ocenjevalnih težav osnovnih elementov vodnega kroga in medsebojnega vpliva. Odstopanja med posameznimi elementi so izražena v odstotkih bilančne napake. Pozitivne vrednosti napake lahko kažejo na preveliko oceno količine padavin, na premajhno oceno količine izhlapevanja ali na podcenjene odtoke. Negativne vrednosti napake pa kažejo možnost obratne ocene vodnobilančnih elementov. Pri tem moramo še posebej upoštevati naravnogeografske razmere, zlasti določevanje razvodnic, seveda pa imajo tudi družbenogeografski dejavniki, kot so odvzemi vode ipd., lahko pomemben vpliv na izmerjene količine.

Pozitivna bilančna odstopanja

Največje bilančno odstopanje smo zaznali pri hidrometričnih zaledjih z vodomernimi postajami, kjer je znana težava »zatekanje« vode v prod mimo merskega profila, bodisi pod strugo ali v brežini. Na Nadiži je merski profil v prod, Pšata teče po aluvialni ravnici, na Višnjici, Temenici, Cerknjčici, Branici in Vipavi pri Mirnu pa je znano ponikanje v kras. V primeru Reke so najverjetnejši vzrok kraške razvodnice ter slabša pokritost območja s klimatološkimi postajami. Na Savi med Čatežem in gorvodnimi postajami so najverjetnejši vzrok veliki pretoki.

in the southern and western parts the value rises to 750 mm. In Slovenia, the most water evaporates from the river basins of the Nadiža, Idrija, Branica, Močilnik, Dragonja and Borovnišča and from the headwaters of the Sotla and the entire river basin of the Kolpa and Radešca.

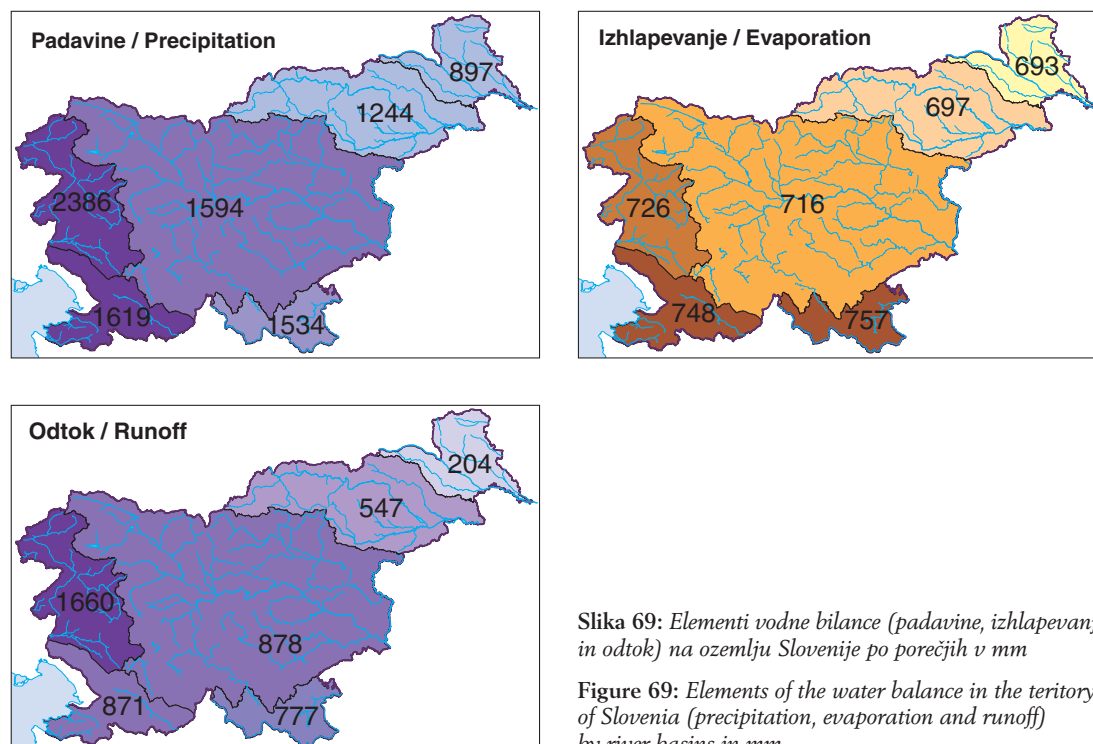
The geographical distribution of runoff characteristics is similar to precipitations'. From the highest runoffs in the Alps the amount is lowering towards the south and east.

Water Balance Deviation

The water balance deviation is an indicator of problems with the measurement and assessment of the basic elements of the water cycle and their interaction. Deviations between the individual elements are expressed in percentages of the water balance error. Positive error values may indicate too high an estimation of precipitation, too low an estimation of evaporation or underestimated runoffs. Negative values of the error indicate the possibility of the reverse estimates of these water balance elements. Here, we must especially take into account the natural-geographic conditions (especially when determining water divides) as well as, of course, the social-geographic factors such as water abstraction etc., which can have a significant impact on the quantities measured.

Positive Water Balance Deviations

The greatest water balance deviation was observed in the hydrometric catchment areas with water gauging stations with known problems of the



Slika 69: Elementi vodne bilance (padavine, izhlapevanje in odtok) na ozemlju Slovenije po porečjih v mm

Figure 69: Elements of the water balance in the territory of Slovenia (precipitation, evaporation and runoff) by river basins in mm



FLORJANA ULAGA

Slika 70: Reka pri Trpčanah

Figure 70: The Reka River at Trpčane

Negativna bilančna odstopanja

Največja negativna odstopanja je zaznati v porečju Tolminke. V njenem primeru je napaka velika zaradi prodnatega korita struge in kraške razvodnice, kjer voda odteka iz porečja. Večje odstopanje imajo zaradi kraških hidrogeoloških značilnosti še Pokolpje in del Krke, Kamniška Bistrica ter Dreta. V primeru Savinje gorvodno od Velikega Širja gre najverjetneje za tok podtalnice mimo vodomernih profilov.

5.1 Pregled vodne bilance po porečjih

Rezultati vodnobilančnih elementov kažejo na veliko pestrost klimatogeografskih in hidrogeografskih razmer po posameznih porečjih.

5.1.1 Pomurje

Pomurje je regija z najmanjšimi količinami vode v Sloveniji. V celotnem Pomurju imamo povprečno 897 mm padavin, izhlapi 693 mm, in odteče 204 mm vode letno. Na levem bregu Mure je padavin povsod pod 900 mm, na skrajnem vzhodnem delu celo pod 850 mm. Največ padavin v porečju prejme predel Slovenskih goric v porečju Mure, kjer je ponekod tudi nekaj mm nad 1000 letno. Letna količina izhlapevanja je 693 mm in ima geografsko malo odstopanja – podobno je po vsem Pomurju. Pomembna je pokrovnost tal – največ vode izhlapi iz območij pokritih z gozdom. Posledica takega izhlapevanja in padavin so nizke vrednosti odtokov, ki so tu najnižje v državi. Letno povprečno odteče okrog 300 mm z desnega brega Mure, od tam pa količina odtoka pada proti vzhodu.

»seepage« of water into gravel past the measurement cross-section, either below the river channel or within the bank. The measurement cross-section on the Ndiža is located on gravel, the Pšata runs over an alluvial plain, while the Višnjica, Temenica, Cerknjščica, Branica and Vipava at Miren disappear into the Karst. In the case of the Reka River, the most probable causes are the karstic water divides and poorer coverage of the area by climatological stations. On the Sava River between Čatež and the upstream stations, the most probable cause is the large discharges.

Negative Water Balance Deviations

The greatest negative deviations can be observed in the Tolminka river basin. In this case, the error is significant because of the gravel river channel and the karstic water divide where the water runs off from the river basin. Because of the karstic hydrogeological properties, the Pokolpje (Kolpa river basin) and a part of the Krka River, Kamniška Bistrica and Dreta experience greater deviations. In case of the Savinja upstream from Veliko Širje, the most probable cause is the flow of the groundwater past the hydrometric cross-sections.

5.1 Overview of the Water Balance by River Basins

The results of the water balance elements indicate a great variety of climatic-geographical and hydrogeographical conditions in individual areas.

5.1.1 Pomurje (The Mura River Basin)

Pomurje is the region with the least water in Slovenia. On average, there is 897 mm of precipitation, 693 mm of evaporation and 204 mm of runoff annually in the entire Pomurje. Throughout the left bank of the Mura, there is less than 900 mm of precipitation, while in the eastern-most part there is less than 850 mm. The most precipitation in the river basin occurs in the Slovenske gorice area in the Mura river basin, where there is somewhat over 1000 mm of precipitation annually in some places. The annual evaporation quantity is 693 mm and has only slight geographical deviation – the situation being similar throughout Pomurje. The land cover is important as the most water evaporates in areas covered with forest. The result of this evaporation and precipitation are the low runoff values – with the lowest in the country being in this area. The average annual runoff is around

5.1.2 Podravje

Slovenski del porečja Drave zajema bolj raznolike pokrajine od Pomurja. V celotnem Podravju pade povprečno 1244 mm padavin, izhlapi 697 mm, odteče pa 547 mm vode letno. Povsod v Podravju izmerijo nad 1000 mm padavin na leto. Najmanj jih je v Slovenskih goricah, kjer jih je v južnem delu okrog 1000, v severnem pa okoli 1100 mm. Območje nižinskega dela Dravsko-Ptujskega polja, Halož in obronkov Pohorja ima dobrih 1200 mm padavin. Količina padavin odtod raste proti višjim delom Pohorja in zahodnih Karavank, kjer jih je nad 1600 mm. Izhlapenja je najmanj na območju Slovenskih goric in Dravskega polja ter v najvišjih predelih porečja Drave – na Pohorju in v Karavankah, kjer izhlapi tudi manj kot 650 mm letno. V preostalem delu je izhlapevanja preko 700 mm letno, največ na posameznih predelih Halož – preko 800 mm. Odtoki kažejo podobno sliko – najmanjši (okrog 300 mm letno) so na vzhodnem delu, najvišji pa v višjih predelih Pohorja in Karavank, kjer dosežejo tudi preko 1100 mm letno.

5.1.3 Posavje

Posavje je največje porečje. V celotnem Posavju brez Kolpe je v obdobju 1971–2000 povprečno padlo 1594 mm padavin, izhlapelo 716 mm in odteklo 878 mm vode letno. V najbolj namočenih predelih Julijcev, v zahodnih predelih zaledij Savice, Bohinjske Bistrice in Mostnice

300 mm from the right bank of the Mura, though the runoff decreases as you move westwards.

5.1.2 Podravje (The Drava River Basin)

The Slovenian part of the Drava river basin encompasses a more varied landscape than Pomurje. On average, there is 1244 mm of precipitation in the entire Podravje area, where 697 mm evaporate and 547 mm of water run off annually. Throughout Podravje, the measured annual quantities of precipitation are in excess of 1000 mm. The least precipitation is in Slovenske gorice, where there is around 1000 mm in the southern area and around 1100 mm in the northern part. The area of the lowland part of the Dravsko-Ptujsko polje, Haloze and the hillsides of Pohorje receive over 1200 mm of precipitation. The quantity of precipitation increases from here towards the higher-lying parts of Pohorje and the western Karavanke Mountains, where there is more than 1600 mm of precipitation. Evaporation is lowest in the area of Slovenske gorice and the Dravsko polje, as well as in the highest reaches of the Drava river basin – on Pohorje and in the Karavanke Mountains – where less than 650 mm evaporate per year. In the remaining area, evaporation exceeds 700 mm annually, with the most evaporation occurring in individual areas of Haloze – more than 800 mm. The runoffs show a similar



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Slika 71: Jezerce na Pohorju

Figure 71: Lake on Pohorje



Slika 72: Po dežju

Figure 72: After the rain

pade preko 3000 mm padavin. Preko 3500 mm v povprečju pade na grebenu med Komno in Voglom. Količina padavin se od tod naglo zmanjšuje proti severu in vzhodu. Preko 2500 mm padavin je tako le še v višjih predelih treh triglavske dolin, na zahodni Pokljuki in na območju Koble. Večina planot Julijskih Alp, Karavanke in Kamniške Alpe ter predeli predalpskega hribovja, Javornikov ter Goteniške gore, ima med 2000 in 2500 mm padavin. Odtod količina pada proti vzhodu, tako da ima osrednji del Posavja med 1400 in 1800 mm padavin, velik vzhodni del pa pod 1400 mm. Najmanj padavin v Posavju je v Posotelju – pod 1200 mm na leto. Izhlapavanje je v Posavju najmanjše v dveh večjih območjih: v visokogorskem alpskem svetu (pod 550 mm letno) in v Posotelju (okoli 650 mm letno). Iz Posavja v večini izhlapeva med 650 in 850 mm vode letno, manj na severu in več na južnem delu. V posameznih predelih izhlapi tudi preko 850 mm vendar so to manjši lokalni predeli (predeli na Krško-Brežiškem polju). Odtok je v Posavju razporejen podobno kot padavine. Največ odteče iz alpskih (preko 2500 mm) in predalpskih predelov, odtod pa količina pada proti vzhodu, kjer je odtoka od 300 do 600 mm.

5.1.4 Pokolpje

Pokolpje je del Posavja, ki se izliva v Savo na Hrvaškem. Je kraško porečje. V slovenskem delu Pokolpja v povprečju pade 1534 mm padavin, izhlapi 757 mm, odteče pa 777 mm vode letno. Največ padavin je na zahodu – na robu Snežniškega pogorja in na Kočevskem – preko 2000 mm letno. Največ po vrhovih Goteniške gore, kjer pade tudi do 2400 mm letno. Osrednji del ima okrog 1700 mm padavin, vzhodni z Lahinjo pa okrog 1300 mm. Izhlapavanje je zelo visoko – od 650 pa vse do preko 850 mm letno in je zelo odvisno od rastja in ekspozicije

picture – they are lowest (around 300 mm per year) in the eastern part, and the highest of the higher reaches of Pohorje and the Karavanke Mountains, where they reach more than 1100 mm per year.

5.1.3 Posavje (The Sava River Basin)

Posavje is the largest river basin. In the entire Posavje area, aside from the Kolpa River, there was an average of 1594 mm of precipitation, 716 mm of evaporation and 878 mm of runoff per year in the 1971–2000 period. In the wettest areas of the Julian Alps, the western parts of the catchment areas of the Savica, Bohinjska Bistrica and Mostnica, there is more than 3000 mm of precipitation. There is, on average, more than 3500 mm of precipitation on the ridge between Komna and Vogel. The quantity of precipitation decreases rapidly from here towards the north and east. There is only more than 2500 mm of precipitation in the higher-lying parts of the three Triglav valleys, on western Pokljuka and in the area of Koble. The majority of the plateaus in the Julian Alps, the Karavanke Mountains, the Kamniške Alps and parts of the pre-Alpine hills, Javorniki and Goteniška gora have between 2000 and 2500 mm of precipitation. The quantity drops from here towards the east, so that the central area of Posavje exhibits between 1400 and 1800 mm of precipitation, while the large eastern area is below 1400 mm. The least precipitation in Posavje occurs in Posotelje – below 1200 mm per year. Evaporation in this river basin is the lowest in two larger areas: in the high-mountain Alpine area (below 550 mm annually) and in Posotelje (around 650 mm annually). In general, between 650 and 850 mm of water evaporate from Posavje annually, with less evaporation observed in the north and more in the south. In individual areas, more than 850 mm of water can evaporate, though these are localised (specific areas in the Krško-Brežice Basin). The runoff in Posavje is distributed similar to the precipitation. The most water runs off from the Alpine (in excess of 2500 mm) and pre-Alpine areas, with the quantity dropping from here towards the east, where the runoff is between 300 and 600 mm.

5.1.4 Pokolpje (The Kolpa River Basin)

Pokolpje is a part of Posavje as the Kolpa discharges into the Sava River in Croatia. It is a karstic river basin. In the Slovenian part of Pokolpje, there is an average of 1534 mm of precipitation, 757 mm of evaporation and 777 mm of water run off annually. The most precipitation is in the west – on the edge of the Snežnik

površja. Odtoka je največ v zgornjem delu porečja Kolpe, preko 1600 mm, z območja Gote- niške gore celo slabih 1700 mm letno, od tod hitro pada proti vzhodu. Najmanj ga je v osred- nji Beli krajini, kjer odteče zgolj okoli 400 mm vode letno.

5.1.5 Posočje

Posočje je naše najbolj vodnato porečje. V celot- nem Posočju v povprečju pade 2386 mm pada- vin, izhlapi 726 mm in odteče 1660 mm vode letno. Njegovi najvišji predeli imajo tudi največ padavin – preko 3000 mm letno – visokogorski predeli Julijcev celo preko 3500 mm padavin let- no: Kanin, Krn, Vogel. V alpskih dolinah jih je že manj, med 2300 in 2700 mm. Jugozahodni rob visokih dinarskih planot od Kambreškega, Banjšic do Trnovskega gozda ima padavin okrog 2300 mm. Območje predalpskega hribovja za dinarskim robom ter območje Nanosa ima padavin manj – med 2000 in 2300 mm na leto. Pod 2000 mm padavin je v Goriških brdih in v zgornji Vipavski dolini. Najmanj padavin ima- ta spodnja Vipavska dolina in Vipavska brda, okoli 1500 mm letno. Izhlapavanje v Posočju je najvišje v južni predelih, kjer v posameznih območjih izhlapi preko 850 mm letno, od tu pa pada proti severu skladno z nadmorsko višino – v gorskem svetu Julijcev ga je še okrog 550 mm letno. Velike razlike so tudi v odtoku. Na območ- ju Kaninskega pogorja odteče preko 3000 mm

mountain chain and in around Kočevje – more than 2000 mm annually. The most precipitation is on the tops of Mount Goteniška gora, with up to 2400 mm annually. The central area has around 1700 mm of precipitation, while the east- ern area with Lahinja has around 1300 mm. Evaporation is very high – from 650 to up to over 850 mm per year, and is strongly dependent on the vegetation and the surface exposure. The runoff is highest in the upper part of the Kolpa river basin, with more than 1600 mm. The runoff from Mount Goteniška gora is around 1700 mm per year and drops rapidly from here towards the east. The least runoff occurs in cen- tral Bela krajina, where only around 400 mm of water run off annually.

5.1.5 Posočje (The Soča River Basin)

Posočje is our most water-abundant river basin. In the entire Posočje, there is an average of 2386 mm of precipitation, 726 mm of evapora- tion and 1660 mm of runoff annually. The high- est parts experience over 3000 mm precipitation per year – while the top high-mountain parts of the Julian Alps even have over 3500 mm of precipitation annually: Kanin, Krn, Vogel. There is less precipitation in the Alpine valleys, between 2300 and 2700 mm. The south- west- ern edge of the high Dinaric plateaus from Kambreško and Banjšice to Trnovski gozd have around 2300 mm of precipitation. The area of



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Slika 73: Led

Figure 73: Ice



Slika 74: Križna jama

Figure 74:
The Križna cave

letno, za večino posoških Alp pa je odtok večji od 2000 mm (z izjemo dolinskih predelov). Preko 1500 mm odteče iz območja dinarskih pregrad in osrednjega dela Posočja, severno in južno od dinarskih pregrad pa je odtoka manj: v Idrijski kotlini okrog 1100 mm, v Vipavskih brdih pa se količina zniža na vsega 650 mm letno.

5.1.6 Povodje jadranskih rek brez Posočja

Najmanjši hidrografski del Slovenije predstavlja Reka z zaledjem, ki se v Jadran odtaka pod Krasom, in območje rečic in potokov, ki se izlivajo neposredno v slovensko morje. V celotnem Primorju s Krasom povprečno pade 1619 mm padavin, izhlapi 748 mm, odteče pa 871 mm vode letno. Največ padavin ima okolica Snežnika – preko 2500 mm. Najvišji predeli imajo celo preko 2800 mm padavin letno. Od tam količina padavin pada proti zahodu. Obalni deli imajo dobrih 1000 mm padavin, zahodni Kras pa okrog 1500 mm letno. Izhlapevanje je največje v posameznih predelih Koprškega primorja in na jugozahodnem delu Krasa (preko 850 mm). Proti severu in vzhodu območja količina izhlapevanja pada, najmanjša je v Snežniškem pogorju – pod 700 mm letno. Odtoki so največji na skrajnem vzhodnem delu (okolica Snežnika), kjer do nad 2000 mm (najvišji predeli okrog vrha

the pre-Alpine hills behind the Dinaric edge and the area of Nanos have between 2000 and 2300 mm precipitation annually. Less than 2000 mm of precipitation occur in the Goriška brda and in the Upper Vipava Valley. The lowest precipitation occurs in the Lower Vipava Valley and in the Vipavska brda – around 1500 mm annually. Evaporation in Posočje is highest in the southern areas, where more than 850 mm evaporate annually in some places. The amount drops as you move towards the north in accordance with the elevation – though in the mountainous world of the Julian Alps there is still around 550 mm of evaporation annually. Great differences occur in terms of runoff. In the area of the Kanin mountain chain, the runoff exceeds 3000 mm per year, while in the majority of the Alps in Posočje the runoff is over 2000 mm (with the exception of the valley areas). More than 1500 mm run off from the area of the Dinaric barriers and the central part of Posočje, while the runoff is lower to the north and south of these barriers. In the Idrija Valley it is around 1100 mm and in the Vipavska brda the quantity drops to a mere 650 mm per year.

5.1.6 The Catchment Area of the Adriatic Rivers Without Posočje

The smallest hydrogeographical area of Slovenia is represented by the Reka River – with its catchment area that flows into the Adriatic via the Karst – and the area of small rivers and streams that drain directly into the Slovenian sea. In the entire Primorje area with Karst, there is an average of 1619 mm of precipitation, while 748 mm of water evaporates and 871 mm of water run off annually. The most precipitation falls in the surroundings of Mount Snežnik – more than 2500 mm, though the highest parts have over 2800 mm of precipitation per year. The quantity drops towards the west. The coastal areas receive a good 1000 mm of precipitation and the western Karst around 1500 mm of precipitation annually. Evaporation is highest in individual parts of the Koper coastal area and in the south-western part of the Karst (more than 850 mm). Towards the north and east, the quantity of evaporation drops, being lowest in the Snežnik mountain chain – below 700 mm annually. The runoffs are highest in the eastern-most part (surroundings of Mount Snežnik), where more than 2000 mm of water runs off (2100 mm in the highest parts surrounding the top of Mount Snežnik and Zatrep). Runoffs decrease from there towards the west. The groundwater runoff in the Karst is between 500 and 750 mm, with the lowest being in the Koper coastal area – between 200 and 500 mm annually.

	1961–1990	1971–2000
Padavine <i>Precipitation</i>	1567 mm	1579 mm
Izhlapevanje <i>Evaporation</i>	650 mm	717 mm
Odtok – izračunan ($Q = P - E$) <i>Runoff – calculated according to the equation $Q = P - E$</i>	917 mm	862 mm
Odočni količnik <i>Runoff coefficient</i>	58,5 %	54,5 %

Preglednica 8: Vodna bilanca – primerjava obdobj (vir obdobja 1961–90: Kolbezen et al., 1998) za ozemlje Republike Slovenije

Table 8: The water balance – a comparison of periods (source for the 1961–90 period: Kolbezen et al., 1998) for the territory of the Republic of Slovenia

Snežnika in Zatrepa 2100 mm), od tam pa padajo proti zahodu. S Krasa podzemno odteka med 500 in 750 mm, najmanj pa v Koprskem primorju – med 200 in 500 mm letno.

5.1.7 Slovenija

Slovenija je v svetovnem merilu nadpovprečno namočena dežela. Na celinah planeta v povprečju pade 750 mm padavin, izhlapi 480 mm in odteče 270 mm (Global Water Balance, 2006; Fürst, 2006). Območje Slovenije je v obdobju 1971–2000 vsako leto prejelo v povprečju 1579 mm padavin, izhlapelo je 717 mm, odtok iz države pa je 862 mm vode. V obravnavanih hidrometričnih zaledjih v Sloveniji je v obdobju 1971–2000 padlo povprečno letno 1629 mm padavin, izhlapelo je 719 mm, skupni izmerjen odtok pa je bil 856 mm. Povprečni izmerjen specifični odtok Slovenije je 27 l/s/km², izmerjen odočni količnik pa 53 % in je skoraj enak računemu, ki je 56 %. Povprečno odočno razmerje na Zemlji pa je 36 % (Baumgartner et al., 1996 po Schöniger et al., 2003).

Neposredna primerjava z obdobjno bilanco 1961–1990 (Kolbezen et al., 1998) kaže, da so v obdobju 1971–2000 količine padavin skoraj enake, povečala se je količina izhlapevanja in zmanjšal se je odtok. Izhlapevanje je večje za 11 %, odtok pa manjši za 6 %.

5.1.7 Slovenia

On the global scale, Slovenia exhibits above-average precipitation-abundance. The planet's continents have an average of 750 mm of precipitation, 480 mm of evaporation and 270 mm of runoff (Global Water Balance, 2006; Fürst, 2006). In the 1971–2000 period, the territory of Slovenia received an average of 1579 mm of precipitation every year, had 717 mm of evaporation and the runoff from the country was 862 mm. In the hydrometric catchment areas examined in Slovenia in the 1971–2000 period, there was an average of 1629 mm of annual precipitation, 719 mm of evaporation and the total measured runoff was 856 mm. The average measured specific runoff in Slovenia is 27 l/s/km², the measured runoff coefficient is 53% and is almost equal to the calculated one of 56%. The average runoff ratio on the Earth is 36% (Baumgartner et al., 1996 according to Schöniger et al., 2003).

A direct comparison with the 1961–1990 reference period water balance (Kolbezen et al., 1998) shows that the quantities of precipitation were almost the same in the 1971–2000 period, but that the quantity of evaporation has increased and runoff has decreased. Evaporation is higher by 11%, and the runoff is lower by 6%.



TOMAZ KRASNJA - SOKOL

Slika 75: *Ledena rosa* / Figure 75: *Icy dew*