

Review
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Information Sources and Cartography

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Abstract: The paper describes Internet information sources divided into following three groups: bibliographic databases, citation databases and databases with full texts including electronic journals. Bibliographic databases *Bibliographia Cartographica*, *GEOPHOKA*, *Scopus* and *Current Contents (CC)* are analyzed concerning cartographic content representation. Searching the *Current Contents* database resulted in data about cartographers with more than 10 papers in *CC* journals. According to the *Web of Science* citation database, data are given about the most cited cartographers in papers published during the period between 1955 and the end of 2008 on the condition that each paper was cited at least once between 2000 and 2008. Data are also given about two most cited cartographic papers in the last 50 years. The *PERO* browser (web service of the *Ruđer Bošković* Institute) was used to make a list of cartographic and related electronic journals and electronic versions of printed journals with full text available to Croatian academic and scientific community.

Key words: bibliographic databases, citation databases, full text databases, cartography

pursued. Nowadays, the role is played by Internet databases belonging to one of three groups:

- Bibliographic databases
- Citation databases
- Databases with full texts including electronic journals.

Each type of database is used for different purposes:

- Bibliographic databases – for gaining insight in a particular scientific field
- Citation databases – for gaining insight in a particular scientific area and following responses to a particular paper or a scientist/author within a scientific field
- Full text databases – for finding papers from certain journals or by certain authors (Stojanovski 2009).

Nowadays, the Internet contains many useful information which can be found even without using the mentioned databases, e.g. by using key words and one of the popular browsers. Nevertheless, databases' organization, clearness and relevance make them an indispensable source of reliable information (Stojanovski 2009).

It should be mentioned that some databases enable free access, while access to others has to be paid. Therefore, Croatia started the Centre for Online Databases (URL 1) – a joint project of the Ministry of Science, Education and Sport, CARNet and the *Ruđer Bošković* Institute with the basic goal of ensuring network access to commercial databases, as well as to free access ones for all members of the academic and research community of the Republic of Croatia (researchers, professors and students).

1. Introduction

Up until recently, secondary and tertiary printed publications, e.g. *Referativny zhurnal* or *Bibliographia Cartographica* were a great help to cartographers in seeking information about published papers from fields they

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Informacijski izvori i kartografija

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Sažetak: U članku su opisani informacijski izvori na internetu, svrstani u tri skupine: bibliografske baze podataka (*Bibliographia Cartographica*, *GEOPHOKA*, *Scopus* i *Current Contents (CC)*), citatne baze podataka (*Web of Science: Thomson Reutersa (Science Citation Index Expanded (SCIE), Social Science Citation Index (SSCI) i Arts & Humanities Citation Index (A&HCI)*) i baze podataka s cjelovitim tekstom uključujući elektroničke časopise. U bibliografskim bazama podataka analizirana je zastupljenost kartografskih sadržaja. Pretraživanjem baze CC dobiveni su podaci o kartografima s više od 10 članaka. Prema citatnoj bazi *Web of Science* dani su podaci o kartografima s najvećim ukupnim brojem citata iz članaka objavljenih od 1955. do kraja 2008. godine uz dodatni uvjet da je svaki rad bar jednom citiran u razdoblju 2000–2008. Dani su i podaci o dva najčešće citirana kartografska članka u posljednjih 50 godina. S pomoću pretraživača *PERO* (web-servis knjižnice Instituta Ruđer Bošković) dan je popis kartografskih i njima srodnih elektroničkih časopisa i elektroničkih verzija tiskanih časopisa s cjelovitim tekstom koji su dostupni hrvatskoj akademskoj i znanstvenoj zajednici.

Ključne riječi: bibliografske baze, citatne baze, baze cjelovitog teksta, kartografija

se bavili. Danas su tu ulogu preuzele baze podataka na internetu, koje pripadaju u jednu od ove tri skupine:

- bibliografske baze podataka
- citatne baze podataka
- baze podataka s cjelovitim tekstom uključujući elektroničke časopise.

Svaka vrsta baze podataka koristi se u različite svrhe:

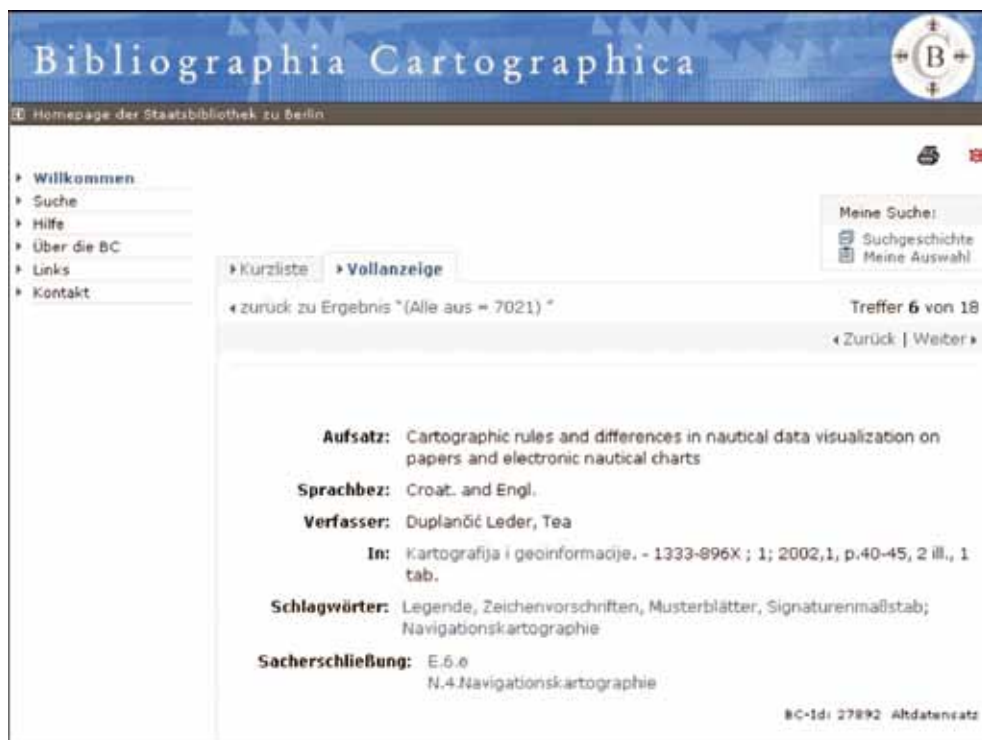
- bibliografske baze – za stjecanje uvida u određeno znanstveno područje
- citatne baze – za stjecanje uvida u određeno znanstveno područje i za praćenje odjeka određenog rada ili znanstvenika/autora unutar znanstvenog područja
- baze cjelovitoga teksta – za pronalaženje radova točno određenih časopisa ili autora (Stojanovski 2009).

Danas se na internetu mogu pronaći mnoge korisne informacije i bez pomoći navedenih baza podataka, npr. s pomoću ključnih riječi i neke od popularnih tražilica. Međutim, navedene su baze podataka zbog svoje organizacije, preglednosti i visoke relevantnosti obrađenih podataka nezaobilazan izvor pouzdanih informacija (Stojanovski 2009).

Potrebno je naglasiti da neke baze omogućuju slobodan pristup, dok je pristup drugima potrebno platiti. Stoga je u Hrvatskoj pokrenut Centar za online baze podataka (URL 1) – zajednički projekt Ministarstva znanosti, obrazovanja i športa, CARNeta i Instituta Ruđer Bošković s osnovnim ciljem osiguravanja mrežnog pristupa komercijalnim bazama podataka kao i onima u slobodnom pristupu za sve članove akademske i istraživačke zajednice RH (istraživače, nastavnike i studente).

1. Uvod

Sekundarne i tercijarne tiskane publikacije, npr. *Referativnij žurnal* ili *Bibliographia Cartographica* bile su sve do nedavno velika pomoć kartografima u traženju informacija o objavljenim radovima iz područja kojim su



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Fig. 1. Entry in the Bibliographia Cartographica database

Sl. 1. Zapis u bazi Bibliographia Cartographica

Nowadays, the Centre for Online Databases offers its users more than 40 databases, the most important of which are bibliographic databases from individual scientific fields, universal databases covering all scientific fields (*Current Contents*, *Web of Science*, *Academic Search Premier*, *Scopus*) and databases with full texts – including collections of electronic journals by major global publishers.

2. Bibliographic Databases

Bibliographic databases contain data about papers published in various publications. Bibliographic entries of papers contain the following data: author, title, source, abstract, publishing year, author's affiliation, publication type, original language of the paper, author's electronic address, document's URL, etc. Let us briefly review the most important universal bibliographic databases and bibliographic databases in the field of cartography.

2.1. Bibliographia Cartographica

As far as we know, *Bibliographia Cartographica* (URL 2) is the only Internet bibliographic database specialized for cartography. It was published in printed form until 2004, and it has been available on the Internet since 2007 (Fig. 1).

The database contains bibliographic data from published volumes no. 16 (1989) through no. 31 (2004) and

data about papers published after 2004 – bibliographic data for a total of about 24 000 papers from journals and proceedings and about 4000 monographs. About 1500-2000 new titles are entered into the database each year. The database records bibliographic data of journals published in about 80 professional journals, and data about monographs and other professional literature from all branches of cartography. Papers from the most important cartographic journals are represented in the base well (see Table 1).

2.2. GEOPHOKA

GEOPHOKA (GEOdäsie, PHOtogrammetrie, KArto-graphie) is a bibliographic database for the fields of geodesy, photogrammetry and cartography produced since 1984. In April 2009, the database contained bibliographic data for approximately 61 700 papers. About 1300 new papers are entered into the database each year. In addition to standard bibliographic data, there are abstracts/summaries for most papers (URL 3). Unfortunately, cartography is not represented enough, e.g. there are no entries from the journals *Cartographic Perspectives*, *Cartography and Geographic Information Science* or *Imago Mundi*.

2.3. Scopus

Scopus (URL 4, Fig. 2) – bibliographic, but at the same time a citation database – is the largest multidisciplinary database which includes papers from 15 000 journals, 535 open-access journals, 750 proceedings,

Fig. 2. Scopus search screen

Sl. 2. Zaslona za pretraživanje baze Scopus

Danas Centar za online baze podataka svojim korisnicima nudi više od četrdeset baza podataka, među kojima su najvažnije bibliografske baze podataka iz pojedinih znanstvenih područja i baze podataka koje pokrivaju sva znanstvena područja (*Current Contents*, *Web of Science*, *Academic Search Premier*, *Scopus*) te baze podataka s cjelovitim tekstom – uključujući zbirke elektroničkih časopisa najvećih svjetskih izdavača.

2. Bibliografske baze podataka

Bibliografske baze podataka sadrže podatke o radovima objavljenim u različitim publikacijama. Bibliografski zapisi radova sadrže ove podatke: autor, naslov rada, izvornik, sažetak, godina objavljivanja, ustanova iz koje dolazi autor, vrsta publikacije, izvorni jezik rada, elektronička adresa autora, URL adresa dokumenta i dr. Osvrnut ćemo se ukratko na najvažnije univerzalne bibliografske baze podataka i bibliografske baze podataka iz područja kartografije.

2.1. *Bibliographia Cartographica*

Bibliographia Cartographica (URL 2), po našem saznanju, jedina je bibliografska baza na internetu specijalizirana za područje kartografije. Do 2004. izlazila je u tiskanom obliku, a od 2007. dostupna je na internetu (sl. 1).

Baza sadrži bibliografske podatke preuzete iz objavljenih svezaka od broja 16 (1989) do broja 31 (2004) i

podatke o radovima objavljenima nakon 2004. – ukupno bibliografske podatke za oko 24 000 članaka iz časopisa i zbornika radova i oko 4000 monografija. Godišnje se u bazi registrira oko 1500–2000 novih naslova. Registriraju se bibliografski podaci radova objavljenih u oko 80 stručnih časopisa, te podaci za monografije i drugu stručnu literaturu iz svih grana kartografije. Članci iz najvažnijih kartografskih časopisa dobro su zastupljeni u bazi (vidi tab. 1).

2.2. *GEOPHOKA*

GEOPHOKA (GEOdäsie, PHOtogrammetrie, KArto-graphie) je bibliografska baza podataka za područje geodezije, fotogrametrije i kartografije koja se izrađuje od 1984. godine. U travnju 2009. sadržavala je bibliografske podatke za približno 61 700 radova. Godišnje se u bazu unesu podaci za oko 1300 novih radova. Osim standardnih bibliografskih podataka za većinu radova dan je i sažetak (URL 3). Nažalost, kartografija nije u bazi dovoljno zastupljena, npr. nema ni jednoga zapisa iz časopisa *Cartographic Perspectives*, *Cartography and Geographic Information Science* ili *Imago Mundi*.

2.3. *Scopus*

Scopus (URL 4, sl. 2) – bibliografska, ali ujedno i citatna baza podataka – najveća je multidisciplinarna baza podataka koja uključuje radove iz 15 000 časopisa, 535 časopisa u otvorenom pristupu, 750 zbornika skupova, 600 publikacija tvrtki, 200 milijuna kvalitetnih web izvora i

Table 1. Number of entries from cartographic journals in Scopus and BC bases
 Tablica 1. Broj priloga iz kartografskih časopisa u bazi Scopus i BC

Journal / Časopis	Scopus	BC
Cartographica	910	224
Cartographic Journal	635	379
Cartographic Perspectives	82	176
Cartography and Geographic Information Science	283	323
Imago Mundi	181	108
Kartografija i geoinformacije	31	18
Kartographische Nachrichten	28	874

600 company publications, 200 million high-quality web sources and 12.7 million patents or a total of 27 million entries and 245 million references/citations (Stojanovski 2009). Table 1 contains numbers of found entries (titles) from most important cartographic journals in the two databases. It enables a comparison of representation of cartographic content in *Scopus* and *Bibliographia Cartographica* (BC) databases.

2.4. Current Contents

Current Contents (CC) is the most popular bibliographic base in Croatia. It is popular due to relatively high criteria of journal selection, coverage of all scientific fields, frequent updates, paper abstracts/summaries, authors' addresses, publisher's names and addresses, possibility to review content of a particular journal issue, and additional keywords which enhance searching (Stojanovski 2009). In addition, Croatia has Regulations for Reaching Scientific Titels (NN 84/2005), according to which one is required to have a certain number of papers published in CC journals in order to get a scientific title.

CC includes about 7600 leading global journals from all scientific fields and more than 2000 books and proceedings.

2.4.1. Cartographers in Current Contents

Due to high selection criteria, there are only three cartographic journals in *Current Contents*: *Cartographic Journal*, *Journal of Maps* and *Cartography and Geographic Information Science* (since January 2009). However, cartographers can also publish their papers in related journals included into CC, some of which are going to be mentioned here. Geographic ones include *Professional Geographer*, *Annals of the Association of American Geographers*, *Mitteilungen der Österreichischen Geographischen Gesellschaft*, geodetic ones include *Survey Review*, journals related to photogrammetry and remote sensing include

ISPRS Journal of Photogrammetry and Remote Sensing, while geoinformation journals include *International Journal of Geographical Information Science*, *Geoinformatica*, *Computers & Geosciences* and others.

We searched *Current Contents* to determine to what extent contemporary cartographers publish their papers in top journals included into the base. By cartographers, we meant scientists who published most of their papers about cartography. Cartography was meant in the narrower sense. For example, papers concerning geoinformation systems were not considered cartographic unless the emphasis was on cartographic design and visualization. Results in Table 2 concern the period from 1993 to September 2009. Cartographers with more than 10 papers in CC journals were included. For each cartographer, there is a number of papers in journals, number of other contributions in journals (editorial commentary, book reviews, letters, etc.) and number of papers in proceedings or books. The order is according to the number of papers in journals.

2.4.1.1. Two cartographers with most papers in CC journals

Daniel Dorling received his PhD in 1991 with the thesis *Visualization of Spatial Social Structure*. He has been a professor of human geography at the *University of Sheffield* since 2003. As the author or in co-authorship, he has published 16 books and atlases, among them *A New Social Atlas of Britain* (1995) and *The Atlas of the Real World* (2008). Furthermore, he has published 242 papers in journals and 283 papers in proceedings of scientific and professional conferences. He reviewed papers for 55 journals, and was a member of the Editorial Board of the *British Cartographic Society* from 2000 to 2006. He has received numerous recognitions, and elected honorary president of the *Society of Cartographers* in 2008 (URL 5).

Zhilin Li received his PhD in photogrammetry and remote sensing at the University of Glasgow in 1990. He

Table 2. Cartographers with more than 10 papers in CC journals

Tablica 2. Kartografi s više od 10 članaka u CC-časopisima

Kartograf Cartographer	Broj članaka u časopisima No. of papers in journals	Broj ostalih priloga u časopisima No. of other contributions in journals	Broj članaka u zbornicima No. of papers in proceedings
Dorling, D.	86	47	
Li, ZL.	42	7	2
MacEachren, A. M.	23	2	
Clarke, K. C.	18	6	
Kraak, M. J.	16	6	6
Cromley, R. G.	15	1	
Perkins, C.	11	16	
Fairbairn, D.	11	4	
Andrienko, G.	11	1	
Andrienko, N.	11		
Hurni, L.	11		

Napomena: pri pretraživanju u bazi zarez iza prezimena ni točke iza inicijala imena se ne stavljaju.

Remark: When browsing the database do not use comma or dot after the first name initial.

12,7 milijuna patenata ili ukupno 27 milijuna zapisa i 245 milijuna referenci/citata (Stojanovski 2009). Radi usporedbe zastupljenosti kartografskog sadržaja u bazama *Scopus* i *Bibliographia Cartographica (BC)*, navedeni su u tablici 1 brojevi pronađenih zapisa (naslova priloga) iz najvažnijih kartografskih časopisa u tim dvjema bazama.

2.4. Current Contents

Current Contents (CC) je najpopularnija bibliografska baza u Hrvatskoj. Razlozi njezine popularnosti relativno su visoki kriteriji odabira časopisa, pokrivenost svih područja znanosti, učestalost ažuriranja, sažetak rada, adrese autora, nazivi i adrese izdavača, mogućnost pregleda sadržaja pojedinog broja časopisa, te dodatne ključne riječi koje unapređuju pretraživanje (Stojanovski 2009). Osim toga u Hrvatskoj je prema Pravilniku za izbor u znanstvena zvanja (NN 84/2005) za izbor u određeno zvanje potrebno imati i određeni broj radova objavljenih u CC-časopisima.

U CC je uvršteno oko 7600 vodećih svjetskih časopisa iz svih područja znanosti te više od 2000 knjiga i zbornika skupa.

2.4.1. Kartografi u *Current Contentsu*

Zbog visokih kriterija odabira časopisa u bazi *Current Contents* samo su tri kartografska časopisa: *Cartographic Journal*, *Journal of Maps* te od 1. siječnja 2009. i

Cartography and Geographic Information Science. Kartografi, međutim, svoje radove mogu objavljivati i u srodnim časopisima uvrštenim u CC, od kojih ćemo neke ovdje spomenuti. Od geografskih časopisa to su *Professional Geographer*, *Annals of the Association of American Geographers*, *Mitteilungen der Österreichischen Geographischen Gesellschaft*, od geodetskih *Survey Review*, od časopisa iz područja fotogrametrije i daljinskih istraživanja *ISPRS Journal of Photogrammetry and Remote Sensing*, od geoinformatičkih *International Journal of Geographical Information Science*, *Geoinformatica*, *Computers & Geosciences* i dr.

Pretražili smo bazu *Current Contents* kako bismo ustanovili u kojoj mjeri suvremeni kartografi objavljuju svoje radove u vrhunskim časopisima uključenim u tu bazu. Kartografima se u ovom radu smatraju znanstvenici koji su većinu svojih radova objavili s kartografskom tematikom. Pod kartografskom tematikom smatrana je kartografija u užem smislu. Npr. radove iz područja geoinformacijskih sustava, ako naglasak nije na kartografskom oblikovanju i vizualizaciji, nismo smatrali kartografskom tematikom. Rezultati u tablici 2 odnose se na razdoblje od 1993. do rujna 2009. Uneseni su kartografi s više od 10 članaka u CC-časopisima. Za svakoga kartografa unesen je broj članaka u časopisima, broj ostalih priloga u časopisima (urednički komentari, prikazi knjiga, pisma i sl.) te broj članaka u zbornicima radova ili knjigama. Redoslijed je prema broju članaka u časopisima.

has worked at the Polytechnic University of Hong Kong since 1996, where he became a full professor in 2003. He lectures cartography, remote sensing and GIS. He has published more than 200 publications, including 120 papers in journals, 10 chapters in books and two research monographs. Prof. Li is the vice-president of the International Cartographic Association, regional editor for Eastern and Southeastern Asia of *The Cartographic Journal* and a member of the Editorial Board of the *International Journal of Geographical Information Science* (URL 6).

3. Citation Databases

Each scientist appreciates if his or her work is acknowledged in the scientific community by being cited in papers by other scientists. The number of citations is a certain measure of a paper's quality, although the number does not always reflect true value of the paper. Nowadays, citation databases enable counting the number of citations a paper has.

Citation databases contain common bibliographic data – author's name, title, name of journal or other source, volume, issue, year, pages, key words, abstract/summary in English, author's and publisher's addresses – but also a list of cited literature which makes them different from other bibliographic databases.

3.1. Web of Science

There are three very famous citation bases of *Thomson Reuters: Science Citation Index Expanded (SCIE)*,

Social Science Citation Index (SSCI) and *Arts & Humanities Citation Index (A&HCI)*, nowadays consolidated in *Web of Science (WoS, URL 7)*. The *SCIE* citation base contains data from 1955, *SSCI* from 1956 and *A&HCI* from 1975 to the present day. They differ from related bases by their precise and relatively high criteria according to which journals are selected to be included in the bases (URL 8). The bases' reputation is supported by the fact that bases *SCIE* and *SSCI* are sources for one of six criteria for the selecting the 500 best universities in the world, which has been done for several years by scientists from the University of Shanghai (URL 9).

The *Web of Science* database is on the Internet within the more complex *ISI Web of Knowledge* database and can be browsed in several ways. For example, one can search all papers by a certain author (*Search*) or all citations of an author or citations of a particular paper (*Cited Reference Search*). Fig. 3 represents the cited reference search screen.

3.1.1. The most cited cartographers according to Web of Science

Citations in citation databases enable various analyses. The simplest approach is to count citations by author, institution, country, journal, scientific field, etc. In this paper, we publish the number of citations in *Web of Science (WoS)* for authors in the field of cartography. We considered cartographers scientists who published most of their papers about cartography (see 2.4.1.). Table 3 contains the total number of citations of scientists' papers published from 1955 (oldest data in the database)

Fig. 3. Web of Science – cited reference search

Sl. 3. Web of Science – zaslón za pretraživanje citiranosti

2.4.1.1. Dva kartografa s najviše članaka u CC-časopisima

Daniel Dorling doktorirao je 1991. s temom *Visualization of Spatial Social Structure*. Od 2003. profesor je antropogeografije na *University of Sheffield*. Kao autor ili koautor objavio je 16 knjiga i atlasa, među njima i *A New Social Atlas of Britain* (1995) i *The Atlas of the Real World* (2008). Objavio je, nadalje 242 članka u časopisima i 283 članka u zbornicima radova sa znanstvenih i stručnih skupova. Bio je recenzent članaka za 55 različitih časopisa, a od 2000. do 2006. bio je član uredničkog odbora *British Cartographic Society*. Za svoj rad primio je mnoga priznanja, a 2008. izabran je za počasnog predsjednika *Society of Cartographers* (URL 5).

Zhilin Li doktorirao je iz područja fotogrametrije i daljinskih istraživanja na Sveučilištu u Glasgowu 1990. Od 1996. radi na Politehničkom sveučilištu u Hong Kongu, gdje je 2003. postao redoviti profesor. Predaje kartografiju, daljinska istraživanja i GIS. Objavio je više od 200 publikacija uključujući 120 članaka u časopisima, 10 poglavlja u knjigama i dvije istraživačke monografije. Prof. Li je potpredsjednik Međunarodnoga kartografskog društva, regionalni urednik za istočnu i jugoistočnu Aziju u časopisu *The Cartographic Journal* i član uredničkog odbora časopisa *International Journal of Geographical Information Science* (URL 6).

3. Citatne baze podataka

Svakom je znanstveniku priznanje ako je njegov objavljeni rad naišao na odjek u znanstvenoj zajednici. Broj citata je određena mjera kvalitete nekog rada, iako taj broj ne svjedoči uvijek o pravoj vrijednosti rada. Brojenje citata koje je neki rad dobio omogućuju danas citatne baze podataka.

Citatne baze sadrže uobičajene bibliografske podatke – ime autora, naslov rada, naziv časopisa ili drugog izvora, volumen, broj, godinu, stranice, ključne riječi, sažetak na engleskom jeziku, adresu autora i nakladnika – ali i popis citirane literature po čemu se razlikuju od ostalih bibliografskih baza podataka.

3.1. Web of Science

Među citatnim bazama podataka vrlo velik ugled u svijetu znanosti imaju tri citatne baze *Thomson Reuters: Science Citation Index Expanded (SCIE)*, *Social Science Citation Index (SSCI)* i *Arts & Humanities Citation Index (A&HCI)* ujedinjene danas u bazi *Web of Science (WoS)*, URL 7). Citatna baza *SCIE* sadrži podatke od 1955. godine, baza *SSCI* od 1956, a baza *A&HCI* od 1975. do danas. Od srodnih baza razlikuju se po preciznim i relativno visokim kriterijima po kojima se biraju časopisi za uvrštavanje u baze (URL 8). O ugledu tih baza govori i podatak da su u rang-listi 500 najboljih sveučilišta na svijetu, koju već nekoliko godina izrađuju znanstvenici sa Sveučilišta u Shanghaiju, izvornici za jedan od šest kriterija baze *SCIE* i *SSCI* (URL 9).

Bazu *Web of Science* smještenu na internetu unutar kompleksnije baze *ISI Web of Knowledge* moguće je pretraživati na više načina. Mogu se npr. tražiti svi članci nekog autora zabilježeni u toj bazi (*Search*) ili se mogu tražiti svi citati koje je dobio neki autor ili pak citati određenog rada (*Cited Reference Search*). Na sl. 3 prikazan je zaslona za pretraživanje citiranosti.

3.1.1. Najcitiraniji kartografi prema citatnoj bazi Web of Science

Citati koje sadrže citatne baze podataka omogućuju provođenje različitih analiza. Najjednostavniji pristup je brojenje citata po autorima, institucijama, zemljama, časopisima, znanstvenim područjima i sl. U ovom članku objavljujemo broj citata u bazi *Web of Science* za autore iz područja kartografije. Kartografima smo u ovom radu smatrali znanstvenike koji su većinu svojih radova objavili s kartografskom tematikom (vidi 2.4.1.). U tablici 3 dan je ukupan broj citata radova pojedinog znanstvenika iz članaka objavljenih od 1955. (najstariji podaci u bazi) do kraja 2008. godine uz dodatni uvjet da je svaki rad bar jednom citiran u razdoblju 2000–2008. Tim dodatnim uvjetom postigli smo da se broje citati samo članaka aktualnih i u 21. stoljeću.

Pri razmatranju podataka iz tablice 3 treba voditi računa da neki kartografski i njima srodni časopisi nisu uvršteni u bazu *Web of Science*. O časopisima koji su uvršteni u tu bazu već je pisano u ovom časopisu (Frančula 2006), a ovdje su navedeni neki časopisi koji nisu uvršteni u *WoS*: *Cartographica*, *Cartographic Perspectives*, *Cartography and Geographic Information Science* (uvršten tek od broja 1 iz 2009), *Kartografija i geoinformacije (Cartography & Geoinformation)*, *Geodesy & Cartography*, *Geodezia és kartográfia*, *Geomatik Schweiz*, *Imago Mundi*, *Kartographische Nachrichten*, *Mercator's World*, *Portolan*. Neki su od mogućih razloga neuvrštavanja ako časopis nema naslov članka, sažetak i ključne riječi na engleskom jeziku ili ako nema međunarodni urednički odbor. Po našem mišljenju neki od spomenutih časopisa ispunjavaju sve uvjete, pa nije jasno zbog čega nisu uvršteni u *WoS*.

Spomenuti u *WoS* neuvršteni časopisi imaju samo djelomičan utjecaj na podatke u tablici 3. Literatura citirana u člancima objavljenima u tim časopisima nije uvrštena u *WoS*, ali članci objavljeni u njima, ako su privukli pozornost znanstvenika koji su svoje članke objavili u časopisima uvrštenima u *WoS*, citirani su.

3.1.1.1. Četiri najcitiranija kartografa

Prof. D. Dorling prvi je na listi kartografa s više od 100 citata u bazi *WoS*. Njegovi bibliografski podaci dani su u odjeljku 2.4.1.1, jer je ujedno i prvi na listi s najvećim brojem članaka u CC-časopisima.

Keith C. Clarke je nakon specijalizacije u analitičkoj kartografiji doktorirao na *University of Michigan*. Od 1996. godine radi na *University of California*, Santa Barbara. Autor je knjiga *Analytical and Computer Cartography* (1995) i *Getting Started with GIS* (1997). U više od

to the end of 2008 on the condition that each paper was cited at least once between 2000 and 2008. This condition means we only counted citations of papers actual in the 21st century.

When reviewing data from Table 3, one should keep in mind that some cartographic and related journals were not included in WoS. Journals included in that database were already written about in this journal (Frančula 2006), and here are some journals not included in WoS: *Cartographica*, *Cartographic Perspectives*, *Cartography and Geographic Information Science* (included from issue no. 1 from 2009), *Kartografija i Geoinformacije (Cartography & Geoinformation)*, *Geodesy & Cartography*, *Geodezija és kartografia*, *Geomatik Schweiz*, *Imago Mundi*, *Kartographische Nachrichten*, *Mercator's World*, *Portolan*. Some of the reasons why a journal is not included are if the journal does not have the title of the article, abstracts and key words in English or if it does not have an international editorial board. We believe some of the mentioned journals fulfil all those requirements, thus it is unclear why they are not included in WoS.

The mentioned journals not included in WoS only have a partial effect on data in Table 3. The references cited in papers published in those journals was not included in WoS, but papers published in them were cited if they attracted scientists who published their papers in journals included in WoS.

3.1.1.1. Four most cited cartographers

Since the first one is Prof. Dorling, the cartographer with most papers in CC journals, this section skips brief biographic data about him because they are given in 2.4.1.1.

Keith C. Clarke received his PhD at the *University of Michigan* after specializing in analytic cartography. He has worked at the *University of California*, Santa Barbara since 1996. He is the author of *Analytical and Computer Cartography* (1995) and *Getting Started with GIS* (1997), as well as more than 80 chapters in books and papers about cartography, remote sensing and geoinformation systems. He was the editor of *International Journal of Geographical Information Systems*. He has been the director of *National Center for Geographic Information and Analysis* since 1997 (URL 10).

Waldo R. Tobler received his PhD in 1961. From 1961 to 1977, he was assistant professor and then professor at the *University of Michigan*, and from 1977 to 1994 professor at the *University of California*, Santa Barbara. He has been professor emeritus since 1994. He lectured about ten courses, such as analytical cartography, computer cartography, history of cartography and cartographic transformations. He is a member of the *National Academy of Sciences of the United States*, he has received numerous recognitions and became an honorary doctor of the *University of Zurich* in 1988 (URL 11).

Alan MacEachren received his PhD at the *University of Kansas* in 1979. He is a professor at the Department of Geography of the *Pennsylvania State University* since 1985. His research interests include geographic visualization, cartography and geoinformation science. He is the author of books *Some Truth with Maps: A Primer on Symbolization and Design* (1994) and *How Maps Work* (1995). He is co-author of *Visualization in Modern Cartography* (1994) and one of the authors and editors of *Exploring Geovisualisation* (2005). He was co-editor of several journals, such as *Computers & Geosciences* and *International Journal of Geographical Information Science* (URL 12).

3.2.2. Two most cited cartographic papers from the last 50 years

Searching the *Web of Science* citation database, we noted two papers which were cited many more times than all other papers about cartography. Those two papers with most citations at the time this paper was written are (September 2009):

- 1) Douglas, D, Peucker, T: Algorithms for the reduction of the number of points required to represent a digitized line or its caricature, *The Canadian Cartographer* 10, 1973, 2, 112–122 (number of citations: 402).
- 1) Tobler, WR: Computer Movie Simulating Urban Growth in Detroit Region, *Economic Geography* 46, 1970, 2, 234–240 (number of citations: 309) (Fig. 4).

Even though the articles were written in 1970 and 1973, respectively, they are still actual, which is illustrated by the fact that Tobler's paper currently (September 2009) has as many as 38 citations from 2009 alone, while Douglas & Peucker's has 23.

4. Databases with Full Texts

The simplest way of accessing the full text of a paper is by clicking the *Full text* link from the bibliographic database itself. The other possibility is via full text databases including e-journal collections. Nowadays, the entire academic and scientific community in Croatia has journals of the following publishers at their disposal through the Centre for Online Databases: *Blackwell Publishing*, *Cambridge University Press*, *EBSCO Publishing*, *Elsevier*, *John Wiley & Sons*, *Oxford University Press*, *Springer Verlag*, *Taylor & Francis* and many open-access journals.

4.1. PERO – Browser of Electronic Sources Online

Considering Croatia did not have a unique database of available e-journals with full texts, the Ruđer Bošković Institute library developed and revealed the PERO web service (URL 13) in November 2006. It is a simple browser of electronic journals and electronic versions of printed journals with full texts available to Croatian academic and scientific community.

Table 3. Cartographers with more than 100 citations

Tablica 3. Kartografi s više od 100 citata

	Kartograf Cartographer	Broj citata No. of citations		Kartograf Cartographer	Broj citata No. of citations
1.	Dorling, D.	1692	23.	Rhind, D.	202
2.	Clarke, K. C.	1029	24.	Peuckers, T. K.	196
3.	Tobler, W.-R.	964	25.	Andrienko, N.	177
4.	MacEachren, A. M.	961	26.	Woodward D.	176
5.	Harley, J. B.	848	27.	Imhof, E.	174
6.	Bertin, J.	832	28.	DiBiase, D.	169
7.	Robinson, A. H.	680	29.	Andrienko, G.	167
8.	Monmonier, M.	627	30.	Kimerling, A. J.	161
9.	Douglas, D. H.	473	31.	Jiang, B.	161
10.	Snyder, J. P.	345	32.	Slocum, T. A.	149
11.	Kraak, M. J.	326	33.	Raisz, E.	148
12.	Li, ZL. (Li Zhilin)	323	34.	Cromley, R. G.	144
13.	Goodchild, M.	321	35.	Moellering, H.	143
14.	Lloyd, R.	296	36.	Skelton, R. A.	141
15.	McMaster, R. B.	286	37.	Crampton, J. (W.)	139
16.	Wood, D.	286	38.	Thrower, N. J. W.	131
17.	Tomlin, C. D.	264	39.	Maling, D. H.	119
18.	Weibel, R.	251	40.	Sester, M.	119
19.	Jenks, G. F.	247	41.	Dent, B. D.	108
20.	Brewer, C. A.	229	42.	Taylor, D. R. F.	108
21.	Muller, J. C.	226	43.	Yoeli, P.	106
22.	Buttenfield, B. P.	222	44.	Peterson, M. P.	101

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Napomena: Pri pretraživanju u bazi ne stavlja se zarez iza prezimena ni točke iza inicijala imena.

Remark: When browsing the database do not use comma or dot after the first name initial.



Daniel Dorling



Zhilin Li



K. C. Clarke



W. R. Tobler



A. MacEachren

D. Dorling i Z. Li, dva kartografa s najviše članaka u CC-časopisima

D. Dorling, K. C. Clarke, W. R. Tobler i A. MacEachren, četiri najcitiranija kartografa

D. Dorling and Z. Li, two cartographers with most papers in CC journals

D. Dorling, K. C. Clarke, W. R. Tobler and A. MacEachren, four most cited cartographers

Web of Science®

<< Back to results list | Record 1 of 1 | >>

COMPUTER MOVIE SIMULATING URBAN GROWTH IN DETROIT REGION

Full Text | Print | E-mail | Add to Marked List | Save to EndNote Web | Save to EndNote, RefMan, ProCite | more options

Author(s): TOBLER WR

Source: ECONOMIC GEOGRAPHY **Volume:** 46 **Issue:** 2 **Pages:** 234-240 **Published:** 1970

Times Cited: 309 **References:** 36 [Citation Map](#)

Document Type: Article

Language: English

Addresses:
1. UNIV MICHIGAN, ANN ARBOR, MI USA

Publisher: ECONOMIC GEOGRAPHY, CLARK UNIV, WORCESTER, MA 01610

Subject Category: Economics, Geography

IDS Number: Y1869

ISSN: 0013-0095

Fig. 4. Paper by WR Tobler from 1970 – entry in Web of Science
Sl. 4. Članak W.-R. Toblera iz 1970. godine – zapis u bazi Web of Science

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PERO contains more than 25 000 e-journals in 16 collections. Three collections are open-access: *Directory of Open Access Journals* (DOAJ) of university libraries in Lund, Hrčak –Portal of Open-Access Scientific Journals of the Republic of Croatia and *PLoS (Public Library of Science)*. The other 13 collections are commercial (Pikić, Vodopijevac 2007).

In order to get to web pages of the journal one is interested in, one needs to input the title or a part of the journal's title into the browsing screen (Fig. 5) and click on the journal title. Most journals are available to the Croatian academic and research community from 1997 to the present day, some also offer access to their archives dozens of years back (see the list below), while some have a delay for accessing full texts, most often 6 or 12, but sometimes even 18 months.

In October 2009, we reviewed the database and composed an alphabetical list of what we considered the most interesting journals for cartographers. The period for which there are full texts is in parentheses, and whether there is an accessing delay to newest issues is also noted:

- Annals of the Association of American Geographers (1911–), 12-month delay
- Cartographic Journal (2003–), 12-month delay
- Cartographica (1997–), 6-month delay
- Cartographic Perspectives (2006–2008)
- Computers & Geosciences (1997–)
- Coordinates: Series A (2005–), Series B (2005–)
- Geodesy & Cartography (2005–)
- Geodetski list (2005–)

- Geodetski vestnik (2000–)
- Geoinformatica (1997–)
- International Journal of Geographical Information Science (1998–), 18-month delay
- ISPRS Journal of Photogrammetry and Remote Sensing (1997–)
- Journal of Geodesy (1997–1/2009)
- Journal of Geographical Systems (1999–)
- Journal of Surveying Engineering (1995–), 12-month delay
- Journal of Navigation (2005–)
- Kartografija i geoinformacije (2002–)
- Marine Geodesy (1999–), 12-month delay
- Professional Geographer (1984–), 12-month delay
- Progress in Human Geography (1997–)
- Remote Sensing of Environment (1997–)
- Studia Geophysica et Geodaetica (1997–2008)
- Transactions in GIS (1996–), 12-month delay

Full texts of the *Journal of Maps* e-journal are available via the *DOAJ* open-access collections (URL 14), but registration is necessary.

5. Conclusions

By searching the *Bibliographia Cartographica* cartographic bibliographic base, the *GEOPHOKA* bibliographic base specialized for geodesy, cartography and photogrammetry and the *SCOPUS* universal bibliographic base,



Fig. 5. PERO – browsing screen

Sl. 5. PERO – zaslon za pretraživanje

80 članaka i poglavlja u knjigama zalazi u područja kartografije, daljinskih istraživanja i geoinformacijskih sustava. Bio je urednik časopisa *International Journal of Geographical Information Systems*. Od 1997. direktor je *National Center for Geographic Information and Analysis*. (URL 10)

Waldo R. Tobler doktorirao je 1961. godine. Od 1961. do 1977. radi kao docent i potom profesor na *University of Michigan*, a od 1977. do 1994. kao profesor na *University of California*, Santa Barbara. Od 1994. profesor je emeritus. Predavao je desetak predmeta, među njima i analitičku kartografiju, računalnu kartografiju, povijest kartografije i kartografske transformacije. Član je *National Academy of Sciences of the United States*, a za svoj rad primio je mnoga priznanja pa je 1988. proglašen i počasnim doktorom Sveučilišta u Zürichu (URL 11).

Alan MacEachren doktorirao je 1979. godine na *University of Kansas*. Od 1985. radi kao profesor na Odjelu za geografiju *Pennsylvania State University*. Područja njegovih istraživanja su geografska vizualizacija, kartografija i geoinformacijska znanost. Autor je poznatih djela *Some Truth with Maps: A Primer on Symbolization and Design* (1994) i *How Maps Work* (1995) te koautor u *Visualization in Modern Cartography* (1994). Jedan je od autora i urednika knjige *Exploring Geovisualisation* (2005). Bio je korednik u nekoliko časopisa, među njima i *Computers & Geosciences* i *International Journal of Geographical Information Science* (URL 12).

3.1.2. Dva najcitiranija kartografska članka u posljednjih 50 godina

Pretražujući citatnu bazu *Web of Science* uočili smo i dva članka koji po broju citata umnogome nadmašuju sve ostale članke iz područja kartografije. Navodimo

naslove tih dvaju najcitiranijih članaka s brojem citata do pisanja ovog članka (rujan 2009):

- 1) Douglas, D., Peucker, T.: Algorithms for the reduction of the number of points required to represent a digitized line or its caricature, *The Canadian Cartographer* 10, 1973, 2, 112–122 (broj citata: 402).
- 2) Tobler, W.-R.: Computer Movie Simulating Urban Growth in Detroit Region, *Economic Geography* 46, 1970, 2, 234–240 (broj citata: 309) (sl. 4).

Koliko su ta dva članka iz 1970. i 1973. godine aktualna i danas, svjedoči podatak da Toblerov članak ima u ovom trenutku (rujan 2009) čak 38 citata iz 2009. godine, a Douglasov i Peuckerov 23 citata.

4. Baze podataka s cjelovitim tekstom

Najjednostavniji način pristupa cjelovitom tekstu rada je preko poveznice *Full text* iz same bibliografske baze podataka. Druga je mogućnost preko baza podataka cjelovitog teksta u koje ulaze i zbirke e-časopisa. Danas su cijeloj akademskoj i znanstvenoj zajednici u Hrvatskoj preko Centra za online baze podataka na raspolaganju među ostalim i časopisi sljedećih izdavača: *Blackwell Publishing*, *Cambridge University Press*, *EBSCO Publishing*, *Elsevier*, *John Wiley & Sons*, *Oxford University Press*, *Springer Verlag*, *Taylor & Francis* te mnogi časopisi u otvorenom pristupu.

4.1. PERO – Pretraživač elektroničkih izvora online

Budući da u Hrvatskoj nije postojala jedinstvena baza dostupnih e-časopisa s cjelovitim tekstom, knjižnica

we determined that there is least cartographic content in *GEOPHOKA*. Cartographic content published in English is best represented in *SCOPUS*, and cartographic content published in German in *Bibliographia Cartographica*.

By searching the *Current Contents* bibliographic base, we determined that from 1993 to September 2009, most papers related to cartography in journals included in the base were published by Daniel Dorling (86) and Zhilin Li (42). The most cited cartographers according to the *Web of Science* citation base, i.e. cartographers with most citations from papers published from 1955 to 2008 were Daniel Dorling (1692), Keith C. Clarke (1029) and Waldo R. Tobler (964), on the condition that each paper was cited at least once between 2000 and 2008.

Concerning the database searching, some things should be noted. There are some problems browsing *Current Contents* and *Web of Science* when several scientists have the same last name and initials. For example, if one searches for citations of certain scientist's papers

in *Web of Science* and gets several thousand entries, it is not simple to isolate entries related to the particular scientist, and it also takes a lot of time. Namely, a cited paper is listed in the base with the abbreviated title of publication it was published in, thus there are also difficulties when two or more scientists are occupied with similar or even the same research fields. There are not as many problems browsing *Current Contents* when one is looking for all titles of a particular scientist published in CC journals.

These searches can be facilitated by including logic operators. Even so, it is not always possible to isolate one scientist's papers because the initials are sometimes written with two and sometimes with one letter. In addition, the base has some errors, e.g. when the first name is listed as the last name, and the last name is listed as initials.

Due to that, it is possible there are some errors in data listed in Table 2 and Table 3. We are going to be grateful to everyone who notifies us of any errors.

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- URL 3: Bundesamt für Kartographie und Geodäsie – <http://www.bkg.bund.de;> →Dienste→ GEOPHOKA (30. 9. 2009)
- URL 4: SCOPUS – <http://www.scopus.com/home.url> (30. 9. 2009)
- URL 5: Professor Danny Dorling – http://www.shef.ac.uk/geography/staff/dorling_danny/ (20. 10. 2009)
- URL 6 Dr. Li Zhi-lin – <http://www.lsgj.polyu.edu.hk/staff/ZL.Li/index.htm> (20. 10. 2009)
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- URL 8: ISI Web of Knowledge – Essays & White Papers – <http://isiwebofknowledge.com/benefits/essays/> (30. 9. 2009)
- URL 9: Academic Ranking of World Universities – <http://www.arwu.org/> (30. 9. 2009)
- URL 10: Keith C. Clarke – <http://www.geog.ucsb.edu/~kclarke/> (20. 10. 2009)
- URL 11 Waldo Tobler – <http://www.geog.ucsb.edu/~tobler/index.html> (20. 10. 2009)
- URL 12 Alan MacEachren – <http://www.geog.psu.edu/people/maceachren/> (20. 10. 2009)
- URL 13 PERO – pretraživač elektroničkih izvora online – <http://knjiznica.irb.hr/pero/index.php> (20. 10. 2009)
- URL 14: Journal of Maps – <http://www.journalofmaps.com/> (30. 9. 2009)

Instituta Ruđer Bošković razvila je i objavila u studenome 2006. web-servis PERO (URL 13). To je jednostavni pretraživač elektroničkih časopisa i elektroničkih verzija tiskanih časopisa s cjelovitim tekstom koji su dostupni hrvatskoj akademskoj i znanstvenoj zajednici.

PERO sadrži više od 25 000 e-časopisa, koji su smješteni u 16 kolekcija. Tri kolekcije su u otvorenom pristupu: *Directory of Open Access Journals (DOAJ)* sveučilišnih knjižnica u Lundu (Švedska), *Portal znanstvenih časopisa Republike Hrvatske (Hrčak)* i *Public Library of Science (PLoS)*. Ostalih 13 kolekcija komercijalnog je karaktera (Pikić, Vodopijevac 2007).

Da biste došli na stranice časopisa koji vas zanima, treba na zaslonu za pretraživanje (sl. 5) upisati naziv ili dio naziva časopisa i potom kliknuti na naziv časopisa. Većina časopisa raspoloživa je za hrvatsku akademsku i istraživačku zajednicu od 1997. godine, neki nude pristup i svojim arhivama desetke godina unazad (vidi popis u nastavku), dok za neke postoji odgoda pristupa cjelovitim tekstovima, najčešće od 6 ili 12, a ponekad i 18 mjeseci.

Pregledali smo bazu i u listopadu 2009. sastavili abecedni popis časopisa, po našoj procjeni, interesantnih kartografima. U zagradi je dano razdoblje za koje postoje cjeloviti tekstovi, a dan je i podatak postoji li odgoda pristupa najnovijim brojevima:

- Annals of the Association of American Geographers (1911–), odgoda 12 mjeseci
- Cartographic Journal (2003–), odgoda 12 mjeseci
- Cartographica (1997–), odgoda 6 mjeseci
- Cartographic Perspectives (2006–2008)
- Computers & Geosciences (1997–)
- Coordinates: Series A (2005–), Series B (2005–)
- Geodesy & Cartography (2005–)
- Geodetski list (2005–)
- Geodetski vestnik (2000–)
- GeoInformatica (1997–)
- International Journal of Geographical Information Science (1998–), odgoda 18 mjeseci
- ISPRS Journal of Photogrammetry and Remote Sensing (1997–)
- Journal of Geodesy (1997–1/2009)
- Journal of Geographical Systems (1999–)
- Journal of Surveying Engineering (1995–), odgoda 12 mjeseci
- Journal of Navigation (2005–)
- Kartografija i geoinformacije (2002–)
- Marine Geodesy (1999–), odgoda 12 mjeseci
- Professional Geographer (1984–), odgoda 12 mjeseci

- Progress in Human Geography (1997–)
- Remote Sensing of Environment (1997–)
- Studia Geophysica et Geodaetica (1997–2008)
- Transactions in GIS (1996–), odgoda 12 mjeseci

Preko kolekcije u otvorenom pristupu *DOAJ* dostupni su uz prethodnu registraciju i cjeloviti tekstovi e-časopisa *Journal of Maps* (URL 14).

5. Zaključak

Pretraživanjem kartografske bibliografske baze *Bibliographia Cartographica*, bibliografske baze specijalizirane za područje geodezije kartografije i fotogrametrije *GEOPHOKA* i univerzalne bibliografske baze *SCOPUS* utvrdili smo da su kartografski sadržaji najslabije zastupljeni u bazi *GEOPHOKA*. Kartografski sadržaji objavljeni na engleskom jeziku najbolje su zastupljeni u bazi *SCOPUS*, a kartografski sadržaji objavljeni na njemačkom jeziku u bazi *Bibliographia Cartographica*.

Pretraživanjem bibliografske baze *Current Contents* utvrdili smo da su od 1993. do rujna 2009. najviše članaka s kartografskom tematikom u časopisima uvrštenim u tu bazu objavili Daniel Dorling (86 naslova) i Zhilin Li (42). Najcitiraniji kartografi prema citatnoj bazi *Web of Science*, tj. kartografi s najvećim ukupnim brojem citata iz članaka objavljenih od 1955. do kraja 2008. godine uz dodatni uvjet da je svaki rad bar jednom citiran u razdoblju 2000. – 2008. jesu Daniel Dorling (1692 citata), Keith C. Clarke (1029) i Waldo R. Tobler (964).

U vezi s navedenim pretraživanjima potrebno je dati nekoliko napomena. U pretraživanju baza *Current Contents* i *Web of Science* teškoće nastaju kada isto prezime i inicijale imena ima više znanstvenika. Primjerice tražeći citate radova nekog znanstvenika u bazi *Web of Science* može se dobiti i više tisuća zapisa. Izdvajanje zapisa koji se odnose na traženog znanstvenika nije jednostavno, a traži i mnogo vremena. Naime, rad koji se citira naveden je u bazi skraćenim nazivom publikacije u kojoj je objavljen pa teškoće nastaju i kada dvoje ili više znanstvenika radi na srodnim ili čak na istim područjima istraživanja. Nešto manje poteškoća predstavlja pretraživanje baze *Current Contents* kada se traže svi naslovi jednog znanstvenika objavljeni u *CC*-časopisima.

Navedena traženja možemo olakšati pretraživanjem više polja istodobno upotrebom logičkih operatora. Ali ni tada nije uvijek moguće izdvojiti radove jednog znanstvenika, jer su npr. inicijali imena ponekad napisani s dva slova, a ponekad s jednim. Osim toga u bazi ima i pogrešaka, npr. kad je ime zapisano kao prezime, a od prezimena su dani inicijali.

Sve su to razlozi zbog kojih su moguće pogreške u podacima navedenim u tablicama 2 i 3. Bit ćemo zahvalni svima koji nas na njih upozore.