were determined, also. Thus, the climatological radar precipitation estimation correction for the fourteen automatic meteorological stations in the selected period was created. In order to achieve progress in this field of research, future focus should be on the study of a longer time series, separated case studies of precipitation in rainfall form and snow form, and the selection of only those meteorological stations that do not have big radar precipitation estimation errors.

6. References

Atlas, D., Rosenfeld, D. and Wolff, D. B. (1990): Climatologically tuned reflectivity-rain rate relations and links to area - time integrals, Journal of Applied Meteorology, 29, 1, 1120-1135.

Borga, M. (2002): Accuracy of radar rainfall estimates for streamflow simulation, Journal of Hydrology, 267, 1-2, 26-39.

Frugis, B. J. and Wasula, T. A. (2011): Development of warning thresholds for one inch or greater hail in the Albany New York County Warning Area, Eastern Region Technical Attachment No. 2011-05.

Holleman, I. (2006): Bias adjustment of radar-based 3-hour precipitation accumulations, Technical Report, KNMI TR-290.

Hunter, S. M. (1999): WSR-88D radar rainfall estimation: capabilities, limitations and potential improvements, URL: http://www.srh.noaa.gov/mrx/research/precip/precip.php (accessed 14th August 2016).

Lee, G. W. and Zawadzki, I. (2005): Variability of drop size distributions: time-scale dependence of the variability and its effects on rain estimation, Journal of Applied Meteorology, 44, 241-255.

Jelić, D. (2013): Analiza radarskih procjena oborine (*Analysis of radar precipitation estimation*), diploma work, *Department of Geophysics, Faculty of Science, University of Zagreb (in Croatian).*

Marshall, J. S. and Palmer, W. M. (1948): The Distribution of Rainfalldrops with Size, Journal of Meteorology, 5, 165-166.

Mesić Kiš, I. and Malvić, T. (2014): Zonal estimation and interpolation as simultaneous approaches in the case of small input data set (Šandrovac field, northern Croatia), The Mining-Geological-Petroleum Engineering Bulletin, 29, 9-16.

Mushore, T. D. (2012): Gauge measurements and ground-radar observations of rainfall over the Water Board district Regge and Dinkel, diploma work, *Faculty of Geo-Information Science and Earth Observation of the University of Twente.*

Novak Zelenika, K. and Malvić, T. (2014): Determination of low permeable lithofacies, as type of unconventional hydrocarbon reservoirs, using sequential indicator methods, case study from the Kloštar field, The Mining-Geological-Petroleum Engineering Bulletin, 28, 23-38.

Rinehart, R. E. (2004): Radar for meteorologists, Rinehart Publications, Grand Forks, 482 p.

Shelton, M. L. (2009): Hydroclimatology: perspectives and applications, Cambridge University, UK, 426 p.

Spilhaus, A. F. (1948): Raindrop size, shape, and falling speed, Journal of Meteorology, 5, 108-110.

Wilson, J. W. and Brandes, E. A. (1979): Radar measurement of rainfall – a summary, Bulletin of the American Meteorological Society, 60, 1048-1058.

SAŽETAK

Analiza radarske procjene oborina u Središnjoj Hrvatskoj

Dobro praćenje oborine od velike je važnosti u mnogim granama ljudskoga djelovanja koje se koriste meteorološkim informacijama. Oborina je varijabilna u vremenu i prostoru te je zato poželjno primjenjivati alate koji osiguravaju dobru prostornu i vremensku razlučivost te pojave. U tu se svrhu koristi meteorološki radar radarskoga centra Bilogora. No, radarom se oborina ne mjeri izravno, već se procjenjuje tako da se reflektirani elektromagnetski signal pomoću Z-R relacije pretvara u oborinu. U ovome radu analizirano je razdoblje od 1. prosinca 2015. do 31. kolovoza 2016. usporedbom zemaljskih mjerenja satne akumulirane oborine s glavnih meteoroloških postaja i radarske procjene oborine pripadajućih piksela. Utvrdilo se da radar precjenjuje oborinu. Takvu sustavnu pogrešku radarske procjene moguće je umanjiti klimatološkim prilagođavanjem pristranosti. Također, nacrtana je karta sumarne procjene oborine radarom za razdoblje od 1. prosinca 2015. do 31. kolovoza 2016. za središnju Hrvatsku interpolacijskom metodom inverzne udaljenosti.

Ključne riječi
oborina, glavna meteorološka postaja, meteorološki radar, Z-R relacija, klimatološko prilagođavanje pristranosti