

# Waldo Tobler (1930-2018)

## In memoriam

Prof. Emeritus Waldo Tobler, one of the greatest modern geographers and cartographers, died in Santa Barbara on 20 February 2018, at the age of 88.

Waldo Tobler was born on 16 November 1930. He took his doctorate in 1961 at the Department of Geography at Washington University in Seattle. From 1961 to 1977 he was a lecturer and then professor at the University of Michigan, and from 1977 to his retirement in 1994, Professor of Geography at the University of California in Santa Barbara. He was Professor of Statistics at the same university from 1985 to 1994. He was given an honorary doctorate by the University of Zurich in 1988. He became Professor Emeritus of the University of California in 1994.

He was a guest professor at the University of Michigan in 1969, and at the Technical University in Vienna in 1993. He was invited as a guest lecturer in Australia and the People's Republic of China in 1982. He taught a wide range of subjects: Migration, Navigation, Location theory, Regional analysis, Computer graphics, Analytical cartography, Computer cartography, History of cartography, Introductory cartography, Cartographic transformations, Geographic information systems and Mathematical models in human geography.

Prof. Tobler was among the first in the world to apply computer solutions to resolving various cartographic tasks. As early as 1956, he published *Recording Map and Monument Information on IBM cards*, then in 1959, the article *Automation and Cartography*, in 1962, the article *Map Projection Research by Digital Computer*, and in 1964, *An Experiment in the Computer Generalization of Maps and Geographical Coordinate Computations, II: Finite Map Projection Distortions*. In 1970, he published an article entitled *A Computer Movie Simulating Urban Growth in the Detroit Region*, in which he defined the First Law of Geography. According to this law, everything is related to everything else, but near things are more related than distant things. According to Google Scholar, this article has been cited 5,538 times until now. His Second Law of Geography is also well-known: the phenomenon external to an area of interest affects what goes on inside.

Details of the sources where these works were published can be found on Prof. Tobler's website (<http://www.geog.ucsb.edu/~tobler/index.html>). He also posted his curriculum vitae (<https://www.mylife.com/waldo-tobler/waldotobler>) and a list of around 140 published works, from the earliest in 1956 to the last in 2012, along with the full texts of three unpublished works and ten presentations.

Both the authors of this obituary were in contact with Prof. Tobler for many years. Nedjeljko Frančula corresponded with him by mail and e-mail, and Miljenko Lapaine met him in person at the AutoCarto2016 conference held in Albuquerque



in New Mexico. At this meeting, Prof. Tobler held an interesting lecture on cartograms at the workshop of the ICA Commission for Map Projections. It was a topic which he particularly enjoyed. He wrote a chapter entitled *Cartograms as Map Projections* for the book *Choosing a Map Projection*, edited by Miljenko Lapaine and E. Lynn Usery, and published in 2017 by Springer.

In June 1995, our colleague Hrvoje Lukatela informed us that the *National Center for Geographic Information and Analysis* (NCGIA), undoubtedly the scientific centre of the discipline in the United States, had published in the April of that year its Technical Report '95-6, entitled *The Global Demography Project*, by a number of authors among whom the first was Waldo Tobler. In this publication, which was accompanied by a datafile disc, all the statistical data for Yugoslavia were given, and on the maps, the borders of Yugoslavia were marked as state boundaries. I (N.F.) then sent a letter to the NCGIA in which I alerted them to the fact that Yugoslavia no longer existed and had been replaced by several new countries, of which Croatia was one. Prof. Tobler replied to my letter, apologising for the fact that they had taken their statistical data from Eurostat, the statistical office of the European Union, where the data available still referred to Yugoslavia. He enclosed copies of several of his papers with the letter. In response, I sent him copies of several of my works. From then on, Prof. Tobler was in regular contact, sending us presentations of his works on DVDs, and in more recent times, via internet links.

He was the most prominent member of the ICA Commission of Map Projections. Visit his website to find out more about his exceptionally wide-ranging work and life at <http://www.geog.ucsb.edu/~tobler/index.html>.

May his work be a motivation and inspiration to us all.

Nedjeljko Frančula and Miljenko Lapaine ■



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## In memoriam

Prof. Emer. Waldo Tobler, jedan od najvećih geografa i kartografa današnjice, preminuo je 20. veljače 2018. u Santa Barbari u 88. godini.

Waldo Tobler rođen je 16. studenoga 1930. Doktorirao je 1961. na Odjelu za geografiju Sveučilišta Washington u Seattleu. Od 1961. do 1977. bio je docent i potom profesor na Sveučilištu u Michiganu, a od 1977. do umirovljenja 1994. profesor geografije na Sveučilištu California u Santa Barbari. Na istom sveučilištu od 1985. do 1994. bio je i profesor statistike. Počasni doktorat Sveučilišta u Zürichu dodijeljen mu je 1988. Professor emeritus Sveučilišta California postao je 1994.

Gostujući profesor Sveučilišta u Minnesoti bio je 1969., a na Tehničkom sveučilištu u Beču 1993. Pozvani predavač u Australiji i u Narodnoj Republici Kini bio je 1982. Predavao je veliki broj predmeta: Migracije, Navigaciju, Lokacijsku teoriju, Regionalnu analizu, Kompjutorsku grafiku, Analitičku kartografiju, Kompjutorsku kartografiju, Povijest kartografije, Uvod u kartografiju, Kartografske transformacije, Geoinformacijske sustave i Matematičke modele u antropogeografiji.

Prof. Tobler među prvima na svijetu primijenio je kompjutor u rješavanju različitih kartografskih zadataka. Već 1956. objavljuje *Recording Map and Monument Information on IBM cards*, potom 1959. članak *Automation and Cartography*, 1962. članak *Map Projection Research by Digital Computer*, a 1964. radove *An Experiment in the Computer Generalization of Maps* i *Geographical Coordinate Computations, II: Finite Map Projection Distortions*. Godine 1970. objavio je članak *A Computer Movie Simulating Urban Growth in the Detroit Region* u kojem je definirao Prvi zakon geografije. Prema tome zakonu sve je međusobno povezano, ali bliske stvari su povezanije od udaljenih. Prema Google Scholaru taj je članak do danas (ožujak 2018.) citiran 5538 puta. Poznat je i njegov Drugi zakon geografije: Fenomen izvan područja interesa utječe na ono što se događa unutar toga područja.

Podaci o izvornicima u kojima su objavljeni navedeni radovi mogu se naći na mrežnim stranicama prof. Toblera (<http://www.geog.ucsb.edu/~tobler/index.html>). Na svojim mrežnim stranicama prof. Tobler je uz životopis (<https://www.mylife.com/waldo-tobler/waldotobler>) dao i popis svojih oko 140 objavljenih publikacija od prvog rada iz 1956. do posljednjeg iz 2012., pune tekstove tri neobjavljena rada i deset prezentacija.

Oba potpisnika ovog nekrologa dugi su niz godina bili u kontaktu s prof. Toblerom – N. Frančula u početku pismima i potom e-poštom, a M. Lapaine ga je i osobno upoznao na konferenciji AutoCarto2016 održanoj u gradu Albuquerque u New Mexico. Na tom je skupu na radionici Povjerenstva za kartografske projekcije ICA-e prof. Tobler održao zanimljivo



The loximuthal projection  
Loksimutalna projekcija  
Waldo Tobler, 1966.

predavanje o kartogramima. To je jedna od tema kojom se on posebno volio baviti. Za knjigu *Choosing a Map Projection* koju su uredili M. Lapaine i E. L. Usery, a koju je Springer objavio 2017., napisao je poglavlje *Cartograms as Map Projections*.

U lipnju 1995. naš kolega Hrvoje Lukatela upozorio nas je da je *National Center for Geographic Information and Analysis* (NCGIA), nedvojbeno znanstveni centar te discipline u SAD-u, objavio u travnju te godine „Technical Report 95-6“ pod naslovom *The Global Demography Project* skupine autora od kojih je prvi Waldo Tobler. U toj publikaciji, čiji su dio i datoteke na disku, svi statistički podaci dani su za Jugoslaviju, a na kartama su znakom za državnu granicu iscrtane granice Jugoslavije. Uputio sam (N. F.) tada pismo NCGIA-i u kojem sam naveo da Jugoslavija više ne postoji i da na tom prostoru već pet godina postoje nove države od kojih je jedna i Hrvatska. Na moje pismo odgovorio je prof. Tobler, ispričao se i naveo da su statističke podatke za Europu dobili od Eurostata, statističkog ureda Europske unije, u kojima su podaci bili dani još uvijek za Jugoslaviju. Pismu je priložio i kopije nekoliko svojih radova. U odgovoru i ja sam njemu poslao kopije nekoliko svojih radova. Od tada se prof. Tobler često javljao šaljući nam prezentacije svojih radova na DVD-u, a u novije vrijeme poveznice na prezentacije na internetu.

Bio je najistaknutiji član ICA Povjerenstva za kartografske projekcije ICA-e. Posjetite njegovu web stranicu da biste saznali više o njegovu iznimno bogatom radu i životu <http://www.geog.ucsb.edu/~tobler/index.html>.

Neka nam njegovo djelo bude poticaj i inspiracija.

*Nedjeljko Frančula, Miljenko Lapaine* ■