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Place Name Change and GIS: A Review of Recent Literature

Feature Article

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Abstract

This article reviews some of the recent literature on how GIS relates to toponymy in general and, more specifically, to changing place names. It reviews articles on Indigenous names and commemorative place names while considering some of the main reasons place names are revised, such as linguistic and political change in a region. It reviews articles describing settler names in North America and considers questions of gender equity in place names.

Introduction

How are Geographic Information Systems being used in the field of toponymy? The field has benefitted from GIS, enabling a variety of studies, such as how microtoponyms relate to

landscape in Switzerland using semantics, location and topography¹ or the study of exaggerated tsunami-originated place names in the Sanriku Coast area of Japan.² This article reviews some of the recent literature on how GIS relates to toponymy in general and, more specifically, to changing place names.

Jago (2021) looked at changing place names in an article entitled "Renaming Places: How Canada is Reexamining the Map".³ He began by discussing efforts to rename 'Toronto's Dundas Street and concluded that British Columbia, as a name commemorating Christopher Columbus, should be changed. In Canada, changing offensive names has been an ongoing effort. While it is perhaps easier now for equity-seeking groups to effect change, place names have always been in a state of flux for various reasons.

Historical GIS (HGIS) can be used to display, store, and analyze data of past geographies and track changes in time. HGIS is often seen as part of the digital humanities. Maluly, Gil, and Grava (2023) point out that HGIS must have the historical-geographical foundation to be understood as a discipline, writing that if the digital humanities (DHs) are an umbrella, then "HGIS must be both the rain and the umbrella. To locate itself in the DHs, but also to provoke them, operationalized by the 'geographical gaze'."⁴

Fuchs published papers in 2015 based on a case study of German place names in the American Midwest due to settlement patterns during the nineteenth and early twentieth centuries. He used the Geographic Names Information System (GNIS), which includes former and alternative names and spellings. He combined toponymic findings with contemporary ancestry data to confirm distributions and concentrations of German influence and highlight local discrepancies. He wrote that "An important development that has fundamentally reshaped cartography in the past three decades are Geographic Information Systems ... GIS can help identifying inconsistencies,

¹ Julia Villette and Ross S. Purves, "From Microtoponyms to Landscape Using Semantics, Location, and Topography: The Case of *Wald, Holz, Riet, and Moos* in St. Gallen, Switzerland," *The Professional Geographer* 72, no. 1 (2020): 109-20. <https://doi.org/10.1080/00330124.2019.1653772>

² Yuzuru Isoda, Akio Muranaka, Go Tanibata, Kazumasa Hanaoka, Junzo Ohmura, and Akihiro Tsukamoto, "Strengths of Exaggerated Tsunami-Originated Placenames: Disaster Subculture in Sanriku Coast, Japan," *ISPRS International Journal of Geo-Information* 8, no. 10 (2019): 429. <https://doi.org/10.3390/ijgi8100429>

³ Robert Jago, "Renaming Places: How Canada is Reexamining the Map," *Canadian Geographic*, July 22, 2021. <https://canadiangeographic.ca/articles/renaming-places-how-canada-is-reexamining-the-map/>

⁴ Vinicius Maluly, Tiago Gil, and Massimiliano Grava, "Do Historical GIS and Digital Humanities Walk Hand in Hand?" *Cartographica: The International Journal for Geographic Information and Geovisualization* 58, no. 2 (2023): 59-63. <https://doi.org/10.3138/cart-2023-0005>

marginalized phenomena, and alternative perspectives."⁵ He found that GIS software and tools allow for the storing and processing of a variety of toponymic and associated information to support spatio-statistical analyses and visualizations of distributions and patterns.

The author's earlier paper in 2015 noted that 45 percent of Germanic naming in the Midwest is due to names based on persons, and 38.7 percent is due to names based on places, generally describing the possessive character of Germanic naming in the Midwest.⁶ The high percentage of current names (85.7 percent) indicates a general permanence of the Germanic legacy. He concluded that by using GIS, "The identified types and clusters directly inform interpretative and critical analyses of the kind that have recently spurred a renewed interest in place-name research."

1. Indigenous names

Historically, there have been problems with how settlers used Indigenous words in names. Beck described the situation in Canada, stating that the use of Indigenous names fosters a climate in which reconciliation or a form of restitution can be made on the part of settler states.⁷ Renaming efforts have also been made in North American stratigraphic nomenclature, where names are based on toponyms. MacNaughton, Dafoe, and Haggart (2022) proposed guidance on revising existing formal stratigraphic names to allow for the fact that some toponyms on which stratigraphic names are based may be culturally offensive or otherwise inappropriate.⁸ The authors noted the historic suppression of Indigenous languages, including names for geographic features.

In contrast to Canadian historical naming practices, Mamontova and Filippova (2024) discussed the situation of the Evenki people, one of 43 communities in Russia officially recognized as Indigenous peoples of the North, Siberia, and the Far East. The authors critically examined the evolution of Evenki toponyms on official topographic maps over the past century. They contributed

⁵ Stephan Fuchs, "Toponymic GIS — Role and Potential of Place Names in the Context of Geographic Information Systems and GIS," *KN - Journal of Cartography and Geographic Information* 65, no. 6 (2015): 330-37. <https://doi.org/10.1007/BF03545470>

⁶ Stephan Fuchs, "An Integrated Approach to Germanic Place Names in the American Midwest," *The Professional Geographer* 67, no. 3 (2015): 330-41. <https://doi.org/10.1080/00330124.2014.968834>

⁷ Lauren Beck, *Canada's Place Names and How to Change Them* (Montreal: Concordia University Press, 2022), 119.

⁸ Robert B. MacNaughton, Lynn T. Dafoe, and James W. Haggart, "North American Commission on Stratigraphic Nomenclature Note 72 - Application for Revisions to the North American Stratigraphic Code to Address Culturally Offensive or Inappropriate Unit Names and to Encourage the Use of Indigenous Place Names," *Stratigraphy* 19, no. 3 (2022): 187-200. <https://doi.org/10.29041/strat.19.3.03>

to the discussion of critical toponymy by exploring a distinctive Soviet experience, its "decolonial" phase during the 1920s. Although the Soviet government issued guidelines to geodesists on how to document Indigenous toponyms in 1939, emphasizing the importance of first-hand field data and the accurate documentation of Indigenous pronunciation, most field specialists were not trained linguists: "This may possibly explain the presence of official hydronyms in Siberia such as the Gorbiachin River (from Evenki *gerbi achin*, 'no name') or the Echev-Sara River (from Evenki *echev sare*, 'I don't know')."⁹ The authors also wrote that "the problem of implementing accurate toponymic policies becomes even more intricate when confronted with multilingual settings like the Republic of Sakha, with six Indigenous languages, including the state language of Sakha, each holding a distinct place-naming tradition."

An earlier research article by Mamontova and Klyachko (2022) described the development of a flexible tool to represent Indigenous place names as dynamic and to enable Indigenous communities to share their knowledge using an open-ended community-based platform.¹⁰ They found that at least 30 percent of the more than a thousand Siberian place names that Glafira Vasilevich recorded in the field from the 1920s to the 1960s while working closely with the Evenki changed over time. The authors challenged the idea of static landscapes and the conventional view of Indigenous place names as stable, conservative, and even ancient.

2. Commemorative place names

Commemorative place names are a special class of toponyms, often studied at the populated place (city, town, village) or street level. David (2011) found that commemorative names display specific and distinctive features due to their dependence on political regimes and ideologies.¹¹ Commemorative naming was originally developed from a possessive motive. Yet, possession is sometimes only expressed symbolically, and the names are often based on non-personal phenomena, such as events and important dates or other places. This motivation is pervasive in the urbanonymy of Central and Eastern Europe, typical of twentieth-century toponymy, and mainly associated with non-democratic regimes. As an example, the Polish industrial city Katowice was renamed Stalinogrod a few days after the death of Joseph Stalin in 1953. "This change was followed by a further act of naming: all the boys born on the same day the city was renamed were

⁹ Nadezhda Mamontova and Viktoriya Filippova, "Soviet and Russian Regimes of Spatial Inscription: A Critical Analysis of Indigenous versus Official Place Names on Maps in Siberia, 1920s-2000s," *Cartographica: The International Journal for Geographic Information and Geovisualization* 59, no. 1 (2024): 1-16. <https://doi.org/10.3138/cart-2023-0015>

¹⁰ Nadezhda Mamontova and Elena Klyachko, "'Process Toponymy': A GIS-Based Community-Engaged Approach to Indigenous Dynamic Place Naming Systems and Vernacular Cartography," *Cartographica: The International Journal for Geographic Information and Geovisualization* 57, no. 3 (2022): 213-25. <https://doi.org/10.3138/cart-2022-0010>

¹¹ Jaroslav David, "Commemorative Place Names — Their Specificity and Problems," *Names* 59, no. 4 (2011): 214-28. <https://doi.org/10.1179/002777311X13082331190074>

given a third name, Józef, ... in order to commemorate this 'great and sad day.'" The name Katowice was reinstated only three years later with Khrushchev's criticism of the Stalinist era. In his article, David mentioned the goal of creating a landscape "wiped clean of all traces of previous ethnic groups." He also emphasized that an important feature of commemorative names is their instability. The process of naming is less about distinguishing one place from another and more about asserting control. The author noted that during the twentieth century, Czech city centres were repeatedly inundated with commemorative names, but that three typical names dating back to the Middle Ages have survived to the present day: *Úzká* ("Narrow Street"), *Příčná* ("Cross Street"), and *Krátká* ("Short Street"). These names accurately describe the respective streets and show that they are not sufficiently impressive to be given commemorative names.

Buchstaller et al. (2024) showed that the most vivid turnover in the commemorative landscape can be found at the cusp of changes in state ideology when one political regime gives way to another. They believe that most critical toponymy research is historically and geographically narrow. Their research covered new ground by exploring street name changes over a century characterized by consecutive waves of political transformation in Leipzig (East Germany) and Poznań (Poland). They found that "post-colonial and post-communist struggles over public naming, in particular, show the vigor with which such narrative enactment of the city-text is linked to changes in nationhood, identity formation, and (counter)memorialization."¹² The Nazi period in Leipzig was the one when ideological renaming was at its most intense, as shown in Figure 1.

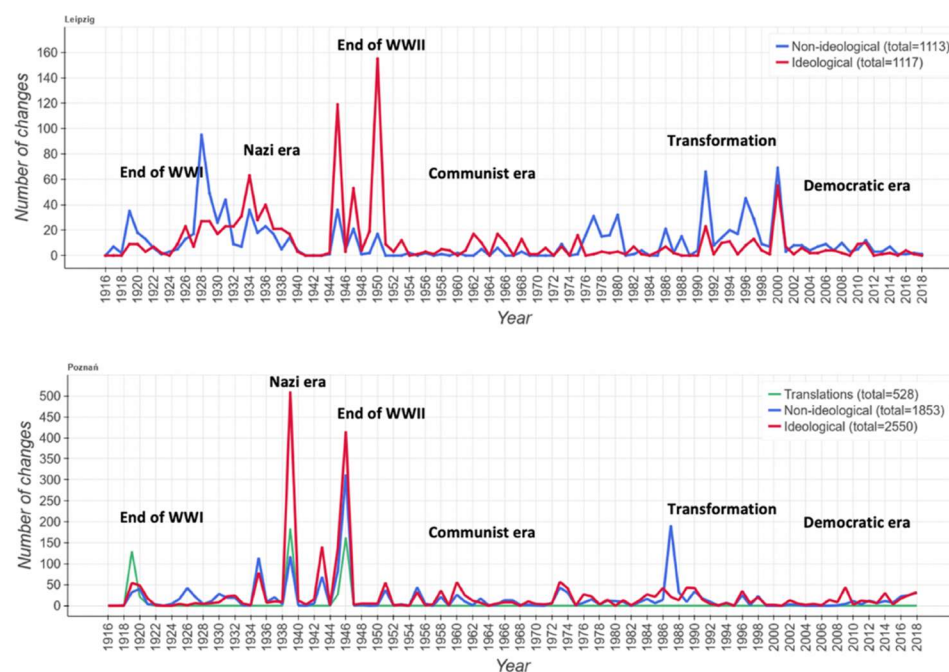


Figure 1: Ideological and non-ideological street renamings in Leipzig and Poznań, 1916-2018. Reproduced from Buchstaller, Fabiszak, Alvanides, Brzezińska, and Dobkiewicz, "Commemorative City-Texts," 299, fig. 2.

¹² Isabelle Buchstaller, Małgorzata Fabiszak, Seraphim Alvanides, Anna Weronika Brzezińska, and Patryk Dobkiewicz, "Commemorative City-Texts: Spatio-Temporal Patterns in Street Names in Leipzig, East Germany and Poznań, Poland," *Language in Society* 53, no. 2 (2024): 291-320. <https://doi.org/10.1017/S0047404523000040>

As for Poznań, there is the added dimension of successive shifts in the official language of administration. For example, the *Nibelungenlied* was commemorated in Leipzig during the Weimar Republic (1919-1932), resulting in streets named after the heroes of this Middle High German poem. The Nazi regime (1933/39-1944) continued this naming theme and carried it over to occupied Poznań. These streets were not renamed in Leipzig, as they commemorated apolitical fictitious figures, but retaining such street names (Brunhildweg, Kreimhildstrasse) in Poznań after the fall of the Nazi Reich was untenable. A map showing street name changes in Poznań over time is reproduced in Figure 2. The longitudinal perspective of this study emphasized that "peaks of change are followed by periods of relatively little re(naming) activity as the revolutionary zeal for erasing old and instigating new heroes, symbols, and values wanes over time."

Changes in street names during 2nd Polish Republic (1919–1938)



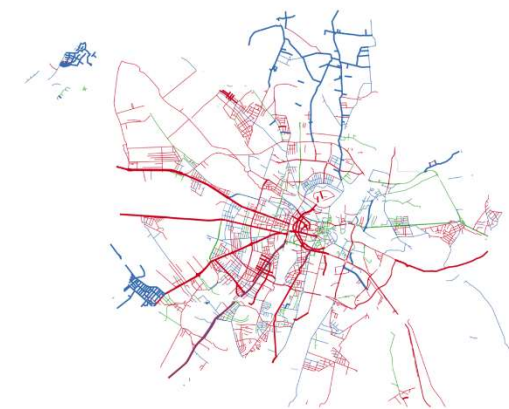
| | N | average/year |
|------------------|-----|--------------|
| Non-ideological | 391 | (~19.5) |
| Ideological | 306 | (~15.3) |
| Total (~average) | 697 | (~34.8) |
| Translations | 154 | (~7.7) |

Changes in street names during the Nazi era (1939–1944)



| | N | average/year |
|------------------|-----|--------------|
| Non-ideological | 193 | (~17.5) |
| Ideological | 682 | (~62.0) |
| Total (~average) | 875 | (~79.5) |
| Translations | 184 | (~16.7) |

Changes in street names during Polish People's Republic (1945–1988)



| | N | average/year |
|------------------|------|--------------|
| Non-ideological | 1006 | (~23.4) |
| Ideological | 1159 | (~26.9) |
| Total (~average) | 2165 | (~50.3) |
| Translations | 190 | (~4.4) |

Changes in street names in the Republic of Poland (1989–2018)



| | N | average/year |
|------------------|-----|--------------|
| Non-ideological | 263 | (~9.1) |
| Ideological | 403 | (~13.9) |
| Total (~average) | 666 | (~23.0) |
| Translations | 0 | |

Figure 2: Spatio-temporal changes in Poznań, 1916-2018. Streets marked in green are translations from German to Polish or vice-versa. Reproduced from Buchstaller, Fabiszak, Alvanides, Brzezińska, and Dobkiewicz, "Commemorative City-Texts," 307, fig. 5.

3. Linguistic change

An example from Western Europe indicates that border changes can result in renaming based more on linguistic lines than commemorative names. Jakobsen (2021) explored changing Danish place names over the country's history and how cartography has been used politically to implement linguistic changes in place names after shifts in the country's boundaries.¹³ After the Middle Ages, the Danish-German borderland region of Schleswig-Holstein was governed by the same duke, and these two duchies were subject to the Danish king. However, the Danish king was also nominally subject to the German emperor for the southern duchy of Holstein. Due to territorial disputes, this part of Denmark was the first to have accurate and detailed mapping, with a vast number of place names added. The Schleswig duchy was a linguistically mixed borderland with place names originating from Danish, Low German, and Frisian. The administrative language of the duchy was predominantly German, so many Danish and Frisian place names had German parallel forms. Eighteenth-century Danish maps show a truly intertwined language mixture in many parts of the duchy. After Denmark won the First Schleswig War in 1851, cartographers were directed to consider local pronunciation and historical records before deciding which linguistic form to use. When Denmark lost the Second Schleswig War in 1864, both duchies were integrated into Germany, and all place names on new maps were consistently given in German. However, a referendum in Schleswig made it possible for the northern half of that duchy to be returned to Denmark in 1920. The Danish government then began a 're-Danification' project in the region. The author also describes the 1685 loss of most of the Danish province of Scania to Sweden. From 1658 to 1720, Scania was a colonial-like province of Sweden, led by a governor general, under whom a deliberate 'Swedification' policy was implemented to integrate Scanians into Sweden.

4. Political change

Regime change is, of course, a worldwide and ongoing phenomenon. Ahmouda and Hochmair (2018) described using crowd-sourced spatial data or Volunteered Geographic Information (VGI) to measure name changes of artificial geographic features resulting from the 2011 Libyan revolution that was part of the Arab Spring revolutionary wave.¹⁴ The 1969 coup that led to the Gadhafi regime resulted in new names associated with the coup, its date, its leaders, and ideals for places such as streets, schools, and plazas. Although most of the old names were associated with the Gadhafi regime, not all of them were changed to be associated with the 2011 revolution. For example, the University of Tripoli returned to its original name from its 1976 renaming as Al Fateh University. Their paper analyzed the usability of crowd-sourced information to identify name changes, comparing five crowd-sourced datasets (OpenStreetMap, Wikimapia, Google Map

¹³ Johnny Grandjean Gøgsig Jakobsen, "Cartography in Danish Place-Name Studies," *Norsk Geografisk Tidsskrift - Norwegian Journal of Geography* 75, no. 1 (2021): 7-21. <https://doi.org/10.1080/00291951.2020.1851755>

¹⁴ Ahmed Ahmouda and Hartwig H. Hochmair, "Using Volunteered Geographic Information to Measure Name Changes of Artificial Geographical Features as a Result of Political Changes: A Libya Case Study," *GeoJournal* 83 (2018): 237-55. <https://doi.org/10.1007/s10708-016-9764-5>

Maker, Panoramio, and Flickr) as well as Facebook sites listing school directories. The local knowledge of residents in the analyzed areas was used as a reference dataset for comparison when available. Some information about name changes was reflected in data disseminated by the geospatial web community and proved particularly valuable in the absence of Libyan government websites or maps at the time.

5. North America

As we saw in the work of Fuchs, toponyms in North America present a special case. Chloupek (2018) reviewed town and city toponyms in Nebraska, resulting from the era of town place-naming at the end of the nineteenth century.¹⁵ He noted that a limited number of actors were responsible for place names in Nebraska, naming entities like the railroads, the United States Postal Service, and groups of settlers from the eastern United States or Europe. The use of repetitive and uninspired place names was well known and decried even when it occurred. Toponyms in most of the United States can not be studied in the same ways as they have been traditionally analyzed in places like Europe or Asia where searching for language or ethnicity-based etymologies can be fruitful. One of the categories of names in this study was "female," however, the author showed that selecting female toponyms for towns can be viewed in essentially the same way as the self-commemoration phenomenon: women commemorated were usually relatives of male founders who had already commemorated themselves in some other place name. The spatially dispersed pattern strongly suggests that naming towns after women was widespread across Nebraska from 1870 to 1889 in contrast to naming towns after places in eastern parts of the United States or after famous individuals of the day.

6. Gender equity

The above sections touched on questions of gender equity and commemorative names for streets in Eastern and Central Europe. Gutiérrez-Mora and Oto-Peralías (2022) noted that the critical geographic literature attributes a strong symbolic power to urban toponyms. The authors researched urban gender bias through street names, developing a methodology to quantify gender bias in street names through computational tools of text analysis.¹⁶ They constructed a geographically specific and time-variant indicator of the female share in street names that permits comparisons across cities and over time. Their case study of Spain showed that the Spanish street map is largely made up of commemorative names, approximately 54 percent. It is generally possible to identify the gender of streets commemorating persons because the names include both forename and surname. The primary dataset used was the Electoral Census Street Map issued by the Spanish Statistical Office. Data from 2001 to 2020 is included, permitting temporal

¹⁵ Brett R. Chloupek, "A GIS Approach to Cultural and Historical Toponymic Research in Nebraska," *Journal of Cultural Geography* 35, no. 1 (2018): 23-43. <https://doi.org/10.1080/08873631.2017.1317182>

¹⁶ Dolores Gutiérrez-Mora and Daniel Oto-Peralías, "Gendered Cities: Studying Urban Gender Bias through Street Names," *Environment and Planning B: Urban Analytics and City Science* 49, no. 6 (2022): 1792-1809. <https://doi.org/10.1177/23998083211068844>

analysis of almost 15 million streets. The most challenging task was identifying whether a street had a male or female name. The classifier algorithm relies on a dictionary-based method. It is implemented as a rule-based system following five steps, one of which deals with streets bearing compound forenames formed by a male and female name, such as José María. Their results show that the female share in streets named after a person rose from 9.6 percent in 2001 to 12.1 percent in 2020. For new and renamed streets, the gender bias is lower at 18.4 percent. Using OpenStreetMap, they also uncovered a strong intra-urban pattern with the proportion of female streets increasing by more than half as one moves away from the city centre. Visualizations based on the classifier's output are valuable tools to show patterns and trends across the country, analyzing how naming patterns fit with sociocultural characteristics of cities.

Devine (2022) also looked at gender equity by studying female commemorative names in Antarctic and Arctic regions.¹⁷ Uncovering Antarctic place names honouring women proved more difficult than studying Spanish street names because place names are usually based on one name, either a forename or a surname. Few women travelled to Antarctica during the early days of the continent's geographic feature naming, and as we saw in the case study of Nebraska, many female names in Antarctica were actually bestowed by males honouring their loved ones. Devine did however document some toponyms commemorating women explorers and scientists after 1947.

An Antarctic case illustrates the problem with naming geographic features after living persons. The Marchant Glacier commemorated geologist David Marchant of Boston University in 1994, recognizing his field work in Antarctica since 1985. Marchant was later found by the university to have sexually harassed at least one of his former graduate students. The original complaint by his graduate student at the time, Jane Willenbring, was lodged in late 2016. The glacier was renamed "Matataua" by the U.S. Board on Geographic Names (BGN) and the Advisory Committee on Antarctic Names (ACAN) in September 2018 due to its proximity to Matataua Peak.¹⁸

The Canadian practice differs: "Since 1990 most of the provincial names boards and members of the Geographical Names Board of Canada (GNBC) have been conservative in the use of commemorative personal names, insisting that persons be deceased for at least one year before their names are to be considered for features."¹⁹ Fritz Müller's former student wrote that the glaciologist named Baby Glacier on Axel Heiberg Island, Nunavut, after his first daughter,

¹⁷ Carol Devine, "Mapping Antarctic and Arctic Women: An Exploration of Polar Women's Experiences and Contributions through Place Names," *Polar Record* 58 (2022): e35. <https://doi.org/10.1017/S003224742100070X>

¹⁸ Jade Payne, "This Antarctic Glacier is Gone, But It's a Good Thing," GlacierHub, September 25, 2018, accessed January 5, 2025, <https://glacierhub.org/2018/09/25/this-antarctic-glacier-is-gone-but-its-a-good-thing/>

¹⁹ Geographical Names Board of Canada, *Principles and Procedures for Geographical Naming, 2011* (Ottawa: Natural Resources Canada, Geographical Names Board of Canada, 2012), 8.

although places in Canada cannot be named after living people.²⁰ The decision date for the name is recorded as 1961. The name is generic, perhaps meant only to celebrate birth. Baby Glacier has not proved to be distinctive with glaciers in Alaska, Montana, and Wyoming also bearing this name.

Conclusion

The use of GIS has revitalized the field of toponymy and made it easier to visualize changes over time and space, as well as incorporate other kinds of data. Longitudinal studies have revealed that name change fatigue gradually sets in after political change, and there is also much focus in the literature on street names. However, the financial cost to rename major thoroughfares in Canada — those most likely to have commemorative names — can be prohibitive due to the need to replace or repair Canadian city infrastructure now nearing the end of its life span. Perhaps it is worthwhile to prioritize squares, statues, and schools forming the city-text in continuing efforts to reflect new shared values. Those of us working in map libraries and archives can work towards documenting the history of place names as part of renaming efforts. Certainly, it's important to preserve maps bearing former names as we enter a new era of commemorative renaming.²¹

²⁰ Peter Adams, "Fritz Müller's Legacy on Axel Heiberg Island, Nunavut, Canada," *Annals of Glaciology* 31 (2000): 3. <https://doi.org/10.3189/172756400781819798>

²¹ U.S. President. Executive Order. "Executive Order of January 20, 2025, Restoring Names that Honor American Greatness." <https://www.whitehouse.gov/presidential-actions/2025/01/restoring-names-that-honor-american-greatness/>