

# CHICAGO STYLE REFERENCING GEOGRAPHIC DATABASES

**CHICAGO STYLE REFERENCING GEOGRAPHIC DATABASES** IS A CRUCIAL SKILL FOR RESEARCHERS, SCHOLARS, AND PRACTITIONERS WORKING WITH SPATIAL DATA. ACCURATELY CITING GEOGRAPHIC DATABASES ENSURES PROPER ATTRIBUTION, ALLOWS FOR VERIFICATION OF SOURCES, AND CONTRIBUTES TO THE INTEGRITY OF ACADEMIC AND PROFESSIONAL WORK. THIS ARTICLE PROVIDES A COMPREHENSIVE GUIDE TO NAVIGATING THE NUANCES OF CHICAGO STYLE WHEN REFERENCING THESE RICH, COMPLEX DATASETS. WE WILL EXPLORE THE FUNDAMENTAL PRINCIPLES OF CITING DIGITAL AND PHYSICAL GEOGRAPHIC DATABASES, DELVE INTO SPECIFIC CONSIDERATIONS FOR VARIOUS TYPES OF SPATIAL INFORMATION, AND OFFER PRACTICAL ADVICE FOR ENSURING COMPLIANCE WITH CHICAGO'S RIGOROUS CITATION STANDARDS. UNDERSTANDING THESE ELEMENTS IS VITAL FOR ANYONE UTILIZING GIS DATA, HISTORICAL MAPS, OR ANY OTHER GEOGRAPHICALLY REFERENCED INFORMATION IN THEIR RESEARCH.

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## UNDERSTANDING GEOGRAPHIC DATABASES IN CITATION

GEOGRAPHIC DATABASES, OFTEN REFERRED TO AS GEOSPATIAL DATA, REPRESENT A DIVERSE CATEGORY OF INFORMATION. THEY ENCOMPASS A WIDE RANGE OF DATA TYPES, FROM VECTOR LAYERS DETAILING ADMINISTRATIVE BOUNDARIES AND INFRASTRUCTURE TO RASTER DATASETS REPRESENTING ELEVATION OR LAND COVER. THE COMPLEXITY AND MULTI-FACETED NATURE OF THESE DATABASES NECESSITATE A CAREFUL APPROACH TO CITATION, ENSURING THAT ALL ESSENTIAL COMPONENTS ARE CLEARLY IDENTIFIED. IN ACADEMIC AND RESEARCH CONTEXTS, FAILING TO PROPERLY CITE THE ORIGIN AND CHARACTERISTICS OF GEOGRAPHIC DATA CAN LEAD TO QUESTIONS ABOUT REPRODUCIBILITY AND THE VALIDITY OF FINDINGS.

WHEN CONSIDERING CHICAGO STYLE REFERENCING GEOGRAPHIC DATABASES, IT'S IMPORTANT TO RECOGNIZE THAT THESE DATASETS ARE NOT TREATED LIKE SIMPLE TEXTUAL SOURCES. THEY OFTEN INVOLVE SPECIFIC SOFTWARE, VERSION NUMBERS, ACQUISITION DATES, AND LICENSING INFORMATION THAT ARE CRITICAL FOR UNDERSTANDING THEIR CONTEXT AND POTENTIAL BIASES. THE CHICAGO MANUAL OF STYLE (CMOS) PROVIDES GENERAL GUIDELINES FOR CITING DIGITAL AND ELECTRONIC RESOURCES, WHICH CAN BE ADAPTED FOR GEOGRAPHIC DATABASES, BUT SPECIFIC NUANCES EXIST DUE TO THE UNIQUE NATURE OF SPATIAL INFORMATION.

## DEFINING GEOGRAPHIC DATABASES FOR CITATION PURPOSES

FOR THE PURPOSES OF CITATION, GEOGRAPHIC DATABASES INCLUDE ANY COLLECTION OF SPATIALLY REFERENCED INFORMATION. THIS CAN RANGE FROM LARGE-SCALE, PROFESSIONALLY CURATED DATASETS FROM GOVERNMENT AGENCIES AND RESEARCH INSTITUTIONS TO SMALLER, MORE SPECIALIZED COLLECTIONS COMPILED BY INDIVIDUALS OR SMALLER ORGANIZATIONS. KEY CHARACTERISTICS THAT DEFINE THEM INCLUDE THEIR GEOGRAPHICAL COVERAGE, THE TYPE OF DATA THEY CONTAIN (E.G., POINTS, LINES, POLYGONS, RASTER IMAGES), THEIR PROJECTION AND COORDINATE SYSTEM, AND THE METADATA ASSOCIATED WITH THEM. PROPER CITATION HINGES ON IDENTIFYING THESE DEFINING ATTRIBUTES ACCURATELY.

THESE DATABASES ARE THE BACKBONE OF GEOGRAPHIC INFORMATION SYSTEMS (GIS) AND PLAY A PIVOTAL ROLE IN FIELDS SUCH AS URBAN PLANNING, ENVIRONMENTAL SCIENCE, DEMOGRAPHY, AND HISTORICAL RESEARCH. THEREFORE, THE WAY IN WHICH THEY ARE CITED DIRECTLY IMPACTS THE TRANSPARENCY AND CREDIBILITY OF THE RESEARCH THAT EMPLOYS THEM. THE CHICAGO STYLE, WITH ITS EMPHASIS ON DETAILED AND PRECISE REFERENCING, IS WELL-SUITED TO CAPTURING THE INTRICACIES OF THESE DATA SOURCES.

# CORE ELEMENTS OF CHICAGO STYLE FOR DATABASES

THE CHICAGO MANUAL OF STYLE, WHEN APPLIED TO DATABASES, REQUIRES A STRUCTURED APPROACH TO PRESENTING ESSENTIAL INFORMATION. FOR GEOGRAPHIC DATABASES, THIS TYPICALLY INVOLVES IDENTIFYING THE AUTHOR OR CREATOR, THE TITLE OF THE DATABASE, THE VERSION OR EDITION (IF APPLICABLE), THE PUBLISHER OR DISTRIBUTOR, THE DATE OF PUBLICATION OR RELEASE, AND THE METHOD OF ACCESS OR LOCATION. THESE FUNDAMENTAL COMPONENTS PROVIDE THE NECESSARY SCAFFOLDING FOR A COMPLETE CITATION, ALLOWING READERS TO LOCATE AND UNDERSTAND THE DATA USED IN THE RESEARCH.

BEYOND THESE CORE ELEMENTS, THE SPECIFIC NATURE OF GEOGRAPHIC DATABASES OFTEN DEMANDS ADDITIONAL DETAILS. THIS INCLUDES INFORMATION ABOUT THE PROJECTION, COORDINATE SYSTEM, AND DATA FORMAT, AS THESE DIRECTLY INFLUENCE HOW THE DATA CAN BE USED AND INTERPRETED. WITHOUT THIS CONTEXTUAL INFORMATION, A CITATION FOR A GEOGRAPHIC DATABASE WOULD BE INCOMPLETE, POTENTIALLY HINDERING A READER'S ABILITY TO REPLICATE OR BUILD UPON THE WORK.

## AUTHOR/CREATOR AND TITLE IDENTIFICATION

IDENTIFYING THE AUTHOR OR CREATOR OF A GEOGRAPHIC DATABASE IS PARAMOUNT. THIS COULD BE AN INDIVIDUAL RESEARCHER, A GOVERNMENT AGENCY (SUCH AS THE U.S. GEOLOGICAL SURVEY OR A NATIONAL CENSUS BUREAU), A RESEARCH INSTITUTION, OR A COMMERCIAL VENDOR. THE TITLE OF THE DATABASE SHOULD BE SPECIFIC AND ACCURATELY REFLECT THE CONTENT AND SCOPE OF THE DATA. IF THE DATABASE IS PART OF A LARGER COLLECTION OR PROJECT, IT IS OFTEN BENEFICIAL TO INCLUDE INFORMATION ABOUT THAT PARENT ENTITY AS WELL.

FOR EXAMPLE, A CITATION MIGHT BEGIN WITH THE NAME OF THE AGENCY THAT COMPILED THE DATA, FOLLOWED BY THE SPECIFIC TITLE OF THE DATASET. IF THE DATABASE IS AVAILABLE ONLINE, THE URL OR DOI (DIGITAL OBJECT IDENTIFIER) WILL BE CRUCIAL FOR ACCESS. THE CHICAGO STYLE OFTEN FAVORS CLARITY AND COMPREHENSIVENESS, SO INCLUDING AS MUCH IDENTIFYING INFORMATION AS POSSIBLE WITHOUT BECOMING OVERLY CUMBERSOME IS GENERALLY ADVISED. THIS ENSURES THAT READERS CAN PRECISELY PINPOINT THE SOURCE BEING REFERENCED.

## PUBLISHER/DISTRIBUTOR AND DATE OF RELEASE

THE PUBLISHER OR DISTRIBUTOR OF A GEOGRAPHIC DATABASE IS THE ENTITY RESPONSIBLE FOR ITS DISSEMINATION. THIS COULD BE THE SAME AS THE CREATOR, OR IT COULD BE A SEPARATE ORGANIZATION THAT HOSTS OR MAKES THE DATA AVAILABLE. THE DATE OF RELEASE OR PUBLICATION IS ALSO CRITICAL, AS GEOGRAPHIC DATA IS OFTEN UPDATED OR REVISED, AND DIFFERENT VERSIONS MAY CONTAIN SIGNIFICANT VARIATIONS. CITING THE SPECIFIC VERSION AND ITS RELEASE DATE ENSURES THAT THE RESEARCHER IS REFERENCING A PARTICULAR, UNCHANGING SNAPSHOT OF THE DATA.

IN CASES WHERE THE DATA IS ACCESSED THROUGH AN ONLINE PORTAL, THE DATE OF ACCESS IS ALSO IMPORTANT, ESPECIALLY FOR DYNAMIC DATASETS THAT ARE SUBJECT TO FREQUENT UPDATES. THE CHICAGO STYLE'S APPROACH TO CITING DIGITAL RESOURCES EMPHASIZES THE IMPORTANCE OF PROVIDING A STABLE REFERENCE POINT, AND FOR GEOGRAPHIC DATABASES, THIS INCLUDES THE VERSION AND RELEASE DATE. THIS ALLOWS READERS TO UNDERSTAND PRECISELY WHICH ITERATION OF THE DATA WAS USED IN THE STUDY.

## CITING DIGITAL GEOGRAPHIC DATABASES

THE MAJORITY OF GEOGRAPHIC DATABASES ENCOUNTERED IN CONTEMPORARY RESEARCH ARE DIGITAL, MAKING THEIR CITATION A KEY CONCERN. CHICAGO STYLE FOR DIGITAL RESOURCES GENERALLY REQUIRES AUTHOR, TITLE, VERSION (IF APPLICABLE), PUBLISHER/DISTRIBUTOR, DATE, AND ACCESS INFORMATION (LIKE A URL OR DOI). WHEN APPLIED TO GEOGRAPHIC DATABASES, THIS FRAMEWORK NEEDS TO BE AUGMENTED WITH DATA-SPECIFIC DETAILS THAT ARE ESSENTIAL FOR UNDERSTANDING THE SPATIAL INFORMATION ITSELF. THE SPECIFIC FORMAT MAY VARY SLIGHTLY DEPENDING ON WHETHER THE DATABASE IS A DOWNLOADABLE FILE, ACCESSED THROUGH A WEB SERVICE, OR PART OF AN INTERACTIVE ONLINE PLATFORM.

ENSURING THAT DIGITAL GEOGRAPHIC DATABASES ARE CITED CORRECTLY ALLOWS FOR GREATER TRANSPARENCY AND REPRODUCIBILITY OF RESEARCH. READERS CAN THEN, IN PRINCIPLE, ACCESS THE SAME DATA AND PERFORM SIMILAR ANALYSES, VERIFYING THE FINDINGS. THIS IS PARTICULARLY IMPORTANT IN SCIENTIFIC DISCIPLINES WHERE DATA IS A FUNDAMENTAL COMPONENT OF EVIDENCE.

## ONLINE DATABASES AND WEB SERVICES

WHEN REFERENCING GEOGRAPHIC DATABASES ACCESSED VIA THE INTERNET, WHETHER THROUGH DIRECT DOWNLOAD, AN API, OR A WEB-BASED VIEWER, THE CITATION SHOULD INCLUDE THE URL AND THE DATE OF ACCESS. FOR DATABASES THAT ARE FREQUENTLY UPDATED, CITING THE SPECIFIC VERSION OR DATE OF DOWNLOAD IS CRUCIAL. MANY ONLINE GEOGRAPHIC DATABASES ARE MANAGED BY GOVERNMENT AGENCIES, RESEARCH INSTITUTIONS, OR CONSORTIA, AND THESE ENTITIES OFTEN PROVIDE SPECIFIC CITATION GUIDELINES FOR THEIR DATA, WHICH SHOULD BE CONSULTED.

THE CHICAGO STYLE'S EMPHASIS ON CLARITY MEANS THAT PROVIDING A STABLE AND VERIFIABLE LINK IS IMPORTANT. IF A DOI IS AVAILABLE FOR THE DATASET, IT SHOULD BE USED AS IT PROVIDES A PERSISTENT IDENTIFIER THAT IS LESS LIKELY TO BREAK THAN A STANDARD URL. THE STRUCTURE FOR CITING ONLINE DATABASES OFTEN RESEMBLES THAT OF OTHER ONLINE RESOURCES, WITH THE ADDITION OF ANY RELEVANT METADATA OR VERSIONING INFORMATION SPECIFIC TO THE GEOGRAPHIC CONTENT.

## GEOGRAPHIC DATASETS AS SOFTWARE OR DATASETS

IN SOME INSTANCES, GEOGRAPHIC DATABASES MIGHT BE DISTRIBUTED AS SOFTWARE PACKAGES THAT INCLUDE DATA, OR AS STANDALONE DATASETS THAT REQUIRE SPECIFIC GIS SOFTWARE TO UTILIZE. IN SUCH CASES, THE CITATION NEEDS TO ACKNOWLEDGE BOTH THE DATA ITSELF AND ANY ASSOCIATED SOFTWARE IF IT'S INTEGRAL TO ACCESSING OR INTERPRETING THE DATA. THE CHICAGO STYLE GUIDELINES FOR CITING SOFTWARE CAN BE ADAPTED HERE, COMBINING ELEMENTS OF BOTH DATA AND SOFTWARE CITATION.

THE DISTINCTION BETWEEN A DATASET AND A SOFTWARE APPLICATION CAN SOMETIMES BE BLURRED, PARTICULARLY WITH COMPLEX GIS PLATFORMS THAT COME BUNDLED WITH EXTENSIVE DATASETS. THE PRIMARY FOCUS FOR CITATION SHOULD REMAIN ON THE SPECIFIC GEOGRAPHIC DATA BEING USED, BUT IF A PARTICULAR SOFTWARE VERSION IS NECESSARY FOR ACCESSING OR PROCESSING THAT DATA, IT SHOULD ALSO BE MENTIONED. THIS ENSURES A COMPLETE PICTURE OF THE RESOURCES EMPLOYED.

## CITING PHYSICAL GEOGRAPHIC DATABASES

WHILE DIGITAL FORMATS ARE PREVALENT, PHYSICAL GEOGRAPHIC DATABASES, SUCH AS PRINTED MAPS, ATLASES, OR COLLECTIONS OF AERIAL PHOTOGRAPHS STORED IN PHYSICAL ARCHIVES, STILL EXIST AND ARE IMPORTANT SOURCES. CHICAGO STYLE REFERENCING THESE PHYSICAL MATERIALS ADHERES TO ITS GENERAL GUIDELINES FOR CITING PRINT RESOURCES, WITH ADDED EMPHASIS ON ELEMENTS THAT DEFINE THE GEOGRAPHIC NATURE OF THE ITEM.

PROPERLY CITING PHYSICAL GEOGRAPHIC MATERIALS ALLOWS RESEARCHERS TO DIRECT OTHERS TO THE SPECIFIC PHYSICAL LOCATION OR REPOSITORY WHERE THE DATA CAN BE FOUND. THIS IS PARTICULARLY RELEVANT FOR HISTORICAL RESEARCH OR WHEN DEALING WITH UNIQUE, NON-DIGITIZED COLLECTIONS. THE DETAILS PROVIDED NEED TO BE SUFFICIENT FOR A LIBRARIAN OR ARCHIVIST, OR ANOTHER RESEARCHER, TO LOCATE THE EXACT ITEM.

## PRINTED MAPS AND ATLASES

WHEN CITING A PRINTED MAP, THE CHICAGO STYLE GENERALLY REQUIRES THE CARTOGRAPHER OR PUBLISHER, THE TITLE OF THE

MAP, THE SCALE, THE PLACE OF PUBLICATION, THE PUBLISHER, AND THE YEAR OF PUBLICATION. FOR ATLASES, IT WOULD INCLUDE THE EDITOR OR COMPILER, THE TITLE OF THE ATLAS, THE PLACE OF PUBLICATION, THE PUBLISHER, AND THE YEAR. ADDITIONAL DETAILS SUCH AS THE MAP PROJECTION, COORDINATE SYSTEM, AND THE SPECIFIC EDITION OR PRINTING CAN ENHANCE THE CITATION'S PRECISION, ESPECIALLY IF THESE ATTRIBUTES ARE CRITICAL TO THE RESEARCH.

FOR A MAP, THE CITATION MIGHT LOOK SOMETHING LIKE: "SMITH, JOHN. 'TOPOGRAPHICAL MAP OF THE YELLOWSTONE REGION.' SCALE 1:100,000. WASHINGTON, D.C.: U.S. GEOLOGICAL SURVEY, 1985." FOR AN ATLAS, IT MIGHT BE: "DOE, JANE, ED. HISTORICAL ATLAS OF ILLINOIS. CHICAGO: UNIVERSITY OF CHICAGO PRESS, 2005." THE KEY IS TO PROVIDE ENOUGH INFORMATION TO IDENTIFY THE SPECIFIC MAP OR ATLAS WITHOUT AMBIGUITY.

## ARCHIVAL GEOGRAPHIC RECORDS

GEOGRAPHIC INFORMATION MAY ALSO BE FOUND IN ARCHIVAL COLLECTIONS, SUCH AS LAND SURVEYS, HISTORICAL CADASTRAL MAPS, OR PHOTOGRAPHIC ARCHIVES. CITING THESE MATERIALS REQUIRES REFERENCING THE SPECIFIC COLLECTION, THE ITEM WITHIN THE COLLECTION, THE ARCHIVE OR REPOSITORY, AND ITS LOCATION. CHICAGO STYLE FOR ARCHIVAL MATERIALS IS DETAILED AND EMPHASIZES PROVIDING A CLEAR PATH TO THE SOURCE WITHIN THE LARGER ORGANIZATIONAL STRUCTURE OF THE ARCHIVE.

A TYPICAL CITATION FOR AN ARCHIVAL GEOGRAPHIC RECORD MIGHT INCLUDE THE NAME OF THE COLLECTION, THE BOX AND FOLDER NUMBER (IF APPLICABLE), THE NAME OF THE ARCHIVE, AND ITS CITY AND STATE. FOR EXAMPLE: "ADAMS, ROBERT. 'SURVEYOR'S NOTES FOR THE TOWN OF SPRINGFIELD.' Box 14, Folder 3. ILLINOIS STATE ARCHIVES, SPRINGFIELD, IL." THIS LEVEL OF DETAIL IS CRUCIAL FOR RESEARCHERS NAVIGATING VAST ARCHIVAL HOLDINGS.

## SPECIAL CONSIDERATIONS FOR GEOGRAPHIC DATA

THE UNIQUE CHARACTERISTICS OF GEOGRAPHIC DATA NECESSITATE SPECIAL CONSIDERATIONS BEYOND STANDARD CITATION PRACTICES. THESE INCLUDE ISSUES OF DATA OWNERSHIP, LICENSING, PROJECTION SYSTEMS, AND METADATA. ADDRESSING THESE ASPECTS ENSURES THAT THE CITATION NOT ONLY ATTRIBUTES THE SOURCE BUT ALSO PROVIDES ESSENTIAL CONTEXT FOR UNDERSTANDING THE DATA'S LIMITATIONS AND POTENTIAL USES, WHICH IS A HALLMARK OF RIGOROUS ACADEMIC WORK.

IN MANY FIELDS, THE PRECISE NATURE OF GEOGRAPHIC DATA MEANS THAT A GENERALIZED CITATION IS INSUFFICIENT. FOR INSTANCE, THE SPATIAL ACCURACY AND THEMATIC ACCURACY OF A DATASET, AS DESCRIBED IN ITS METADATA, ARE OFTEN AS IMPORTANT AS THE DATA'S ORIGIN. THEREFORE, INCORPORATING THESE ELEMENTS INTO THE CITATION, OR AT LEAST REFERENCING THE METADATA, CAN BE HIGHLY BENEFICIAL.

## METADATA AND DATA PROVENANCE

METADATA, OR "DATA ABOUT DATA," IS CRITICALLY IMPORTANT FOR GEOGRAPHIC DATABASES. IT TYPICALLY INCLUDES INFORMATION ABOUT THE DATA'S SOURCE, COLLECTION METHODS, ACCURACY, PROJECTION, TEMPORAL COVERAGE, AND ANY KNOWN LIMITATIONS. CHICAGO STYLE ENCOURAGES REFERENCING METADATA, EITHER BY INCLUDING KEY METADATA ELEMENTS DIRECTLY IN THE CITATION OR BY REFERENCING THE METADATA DOCUMENT ITSELF. THIS PROMOTES TRANSPARENCY AND ALLOWS READERS TO ASSESS THE QUALITY AND SUITABILITY OF THE DATA FOR A PARTICULAR RESEARCH QUESTION.

DATA PROVENANCE, WHICH REFERS TO THE HISTORY OF THE DATA'S ORIGIN, TRANSFORMATIONS, AND OWNERSHIP, IS CLOSELY RELATED TO METADATA. DOCUMENTING PROVENANCE ENSURES THAT THE READER UNDERSTANDS THE COMPLETE LINEAGE OF THE GEOGRAPHIC INFORMATION BEING USED. FOR COMPLEX GEOSPATIAL ANALYSES, THIS CAN BE ESSENTIAL FOR INTERPRETING RESULTS AND ENSURING REPRODUCIBILITY.

## LICENSING AND USAGE RIGHTS

GEOGRAPHIC DATABASES ARE OFTEN SUBJECT TO SPECIFIC LICENSES AND TERMS OF USE. THESE CAN RANGE FROM OPEN-SOURCE LICENSES THAT PERMIT WIDE DISSEMINATION AND USE TO RESTRICTIVE LICENSES THAT LIMIT COMMERCIAL APPLICATION OR REQUIRE SPECIFIC ATTRIBUTION BEYOND A STANDARD CITATION. WHEN CITING GEOGRAPHIC DATABASES, IT IS GOOD PRACTICE TO ACKNOWLEDGE ANY SIGNIFICANT LICENSING CONDITIONS, ESPECIALLY IF THEY IMPACT HOW THE DATA CAN BE USED OR INTERPRETED IN THE RESEARCH. THE CHICAGO STYLE, WHILE NOT MANDATING THE INCLUSION OF EVERY LICENSE DETAIL, ENCOURAGES THOROUGHNESS IN PRESENTING RESEARCH METHODS AND SOURCES.

UNDERSTANDING AND ADHERING TO THESE LICENSES IS NOT ONLY AN ETHICAL REQUIREMENT BUT ALSO A LEGAL ONE. PROPER CITATION HELPS TO TRACK THE USE OF COPYRIGHTED OR LICENSED MATERIAL AND DEMONSTRATES THE RESEARCHER'S DILIGENCE IN RESPECTING INTELLECTUAL PROPERTY RIGHTS. THIS IS PARTICULARLY RELEVANT FOR DATASETS OBTAINED FROM COMMERCIAL VENDORS OR GOVERNMENT BODIES WITH SPECIFIC USAGE AGREEMENTS.

## BEST PRACTICES FOR CHICAGO STYLE GEOGRAPHIC DATABASE REFERENCING

ADHERING TO BEST PRACTICES WHEN CITING GEOGRAPHIC DATABASES IN CHICAGO STYLE ENSURES CLARITY, ACCURACY, AND CREDIBILITY. WHILE THE CORE PRINCIPLES OF CHICAGO STYLE PROVIDE A FRAMEWORK, THE UNIQUE NATURE OF GEOSPATIAL DATA REQUIRES A THOUGHTFUL APPLICATION OF THESE RULES, OFTEN SUPPLEMENTED BY BEST PRACTICES WITHIN THE GIS AND DATA MANAGEMENT COMMUNITIES. THESE PRACTICES AIM TO MAKE THE CITED DATA AS ACCESSIBLE AND UNDERSTANDABLE AS POSSIBLE TO THE READER.

BY FOLLOWING THESE GUIDELINES, RESEARCHERS CAN ENHANCE THE REPRODUCIBILITY OF THEIR WORK AND CONTRIBUTE TO A MORE ROBUST AND TRANSPARENT ACADEMIC DISCOURSE AROUND THE USE OF GEOGRAPHIC INFORMATION. THE GOAL IS TO PROVIDE A CITATION THAT IS BOTH COMPLIANT WITH CHICAGO STYLE AND MAXIMALLY INFORMATIVE TO ANYONE INTERESTED IN THE SPATIAL DATA UNDERPINNING THE RESEARCH.

### CONSISTENCY AND SPECIFICITY

THE MOST CRITICAL BEST PRACTICE IS TO BE CONSISTENT IN HOW GEOGRAPHIC DATABASES ARE CITED THROUGHOUT A DOCUMENT. WHETHER THE DATA IS A SIMPLE SHAPEFILE OR A COMPLEX WEB SERVICE, THE CITATION FORMAT SHOULD REMAIN UNIFORM. FURTHERMORE, SPECIFICITY IS KEY. INSTEAD OF GENERIC REFERENCES, PROVIDE THE EXACT NAME OF THE DATABASE, ITS VERSION NUMBER, THE DATE IT WAS ACCESSED OR PUBLISHED, AND THE SOURCE. THIS LEVEL OF DETAIL PREVENTS AMBIGUITY AND AIDS IN THE RETRIEVAL OF THE EXACT DATA USED.

WHEN IN DOUBT, ERR ON THE SIDE OF PROVIDING MORE INFORMATION RATHER THAN LESS. THIS MIGHT INCLUDE REFERENCING THE COORDINATE SYSTEM, PROJECTION, AND RESOLUTION IF THESE ARE RELEVANT TO THE RESEARCH METHODOLOGY. A WELL-CITED GEOGRAPHIC DATABASE IS A TESTAMENT TO THOROUGH RESEARCH PRACTICE.

### CONSULTING DATA SOURCE DOCUMENTATION

MANY REPUTABLE SOURCES OF GEOGRAPHIC DATA, SUCH AS ESRI, NASA, OR NATIONAL STATISTICAL AGENCIES, PROVIDE SPECIFIC GUIDANCE ON HOW TO CITE THEIR DATASETS. IT IS HIGHLY RECOMMENDED TO CONSULT THESE DOCUMENTATION PAGES OR METADATA FILES FOR ANY RECOMMENDED CITATION FORMAT. WHILE THESE RECOMMENDATIONS MAY NOT ALWAYS PERFECTLY ALIGN WITH CHICAGO STYLE, THEY OFTEN CONTAIN ESSENTIAL INFORMATION THAT SHOULD BE INCORPORATED INTO THE CHICAGO-STYLE CITATION TO ENSURE COMPLETENESS AND ACCURACY.

THIS PROACTIVE STEP NOT ONLY HELPS IN CREATING ACCURATE CITATIONS BUT ALSO DEMONSTRATES A DEEPER UNDERSTANDING AND RESPECT FOR THE DATA PRODUCERS. IT CAN ALSO HIGHLIGHT SPECIFIC DETAILS, LIKE UNIQUE IDENTIFIERS OR

CREATOR ATTRIBUTIONS, THAT ARE VITAL FOR A ROBUST CITATION ACCORDING TO CHICAGO STYLE PRINCIPLES.

## USE OF DOIs AND PERSISTENT IDENTIFIERS

WHEREVER POSSIBLE, USE DIGITAL OBJECT IDENTIFIERS (DOIs) OR OTHER PERSISTENT IDENTIFIERS (LIKE HANDLE SYSTEM IDENTIFIERS) WHEN CITING GEOGRAPHIC DATABASES. THESE ARE DESIGNED TO PROVIDE STABLE LINKS TO ONLINE RESOURCES, EVEN IF THE UNDERLYING URL CHANGES. MANY ACADEMIC REPOSITORIES AND DATA ARCHIVES ASSIGN DOIs TO DATASETS, MAKING THEM IDEAL FOR CITATION PURPOSES. CHICAGO STYLE INCREASINGLY FAVORS DOIs FOR CITING ELECTRONIC RESOURCES.

IF A DOI IS AVAILABLE FOR A GEOGRAPHIC DATABASE, IT SHOULD BE INCLUDED PROMINENTLY IN THE CITATION. THIS SIGNIFICANTLY INCREASES THE LIKELIHOOD THAT A READER WILL BE ABLE TO ACCESS THE DATA, THEREBY ENHANCING THE REPRODUCIBILITY AND CREDIBILITY OF THE RESEARCH. IF NO DOI IS AVAILABLE, A STABLE URL IS THE NEXT BEST OPTION, COUPLED WITH THE DATE OF ACCESS.

THE METICULOUS PROCESS OF REFERENCING GEOGRAPHIC DATABASES IN CHICAGO STYLE IS NOT MERELY AN ACADEMIC FORMALITY; IT IS AN INTEGRAL PART OF CONDUCTING RIGOROUS AND TRANSPARENT RESEARCH. BY UNDERSTANDING THE CORE COMPONENTS, SPECIFIC CONSIDERATIONS FOR DIGITAL AND PHYSICAL FORMATS, AND ADOPTING BEST PRACTICES, RESEARCHERS CAN CONFIDENTLY CITE THEIR SPATIAL DATA, ENSURING PROPER ATTRIBUTION AND ENABLING OTHERS TO VERIFY AND BUILD UPON THEIR WORK. THIS DEDICATION TO DETAIL STRENGTHENS THE FOUNDATION OF ANY SCHOLARLY ENDEAVOR THAT RELIES ON THE POWER OF GEOGRAPHIC INFORMATION.

## FAQ

### Q: WHAT ARE THE ESSENTIAL COMPONENTS FOR CITING A DIGITAL GEOGRAPHIC DATABASE IN CHICAGO STYLE?

A: THE ESSENTIAL COMPONENTS FOR CITING A DIGITAL GEOGRAPHIC DATABASE IN CHICAGO STYLE TYPICALLY INCLUDE THE AUTHOR/CREATOR, THE TITLE OF THE DATABASE, THE VERSION OR EDITION (IF APPLICABLE), THE PUBLISHER OR DISTRIBUTOR, THE DATE OF RELEASE OR PUBLICATION, AND THE ACCESS INFORMATION (SUCH AS A URL OR DOI). ADDITIONAL IMPORTANT DETAILS MIGHT INCLUDE THE PROJECTION SYSTEM AND COORDINATE REFERENCE SYSTEM IF THEY ARE RELEVANT TO YOUR RESEARCH.

### Q: HOW DO I CITE A GEOGRAPHIC DATABASE THAT IS FREQUENTLY UPDATED?

A: WHEN CITING A FREQUENTLY UPDATED GEOGRAPHIC DATABASE, IT IS CRUCIAL TO SPECIFY THE VERSION NUMBER OR THE DATE OF THE SPECIFIC VERSION YOU USED. ALONGSIDE THIS, YOU SHOULD ALSO INCLUDE THE DATE YOU ACCESSED THE DATA IF IT'S AN ONLINE RESOURCE, AS THE CONTENT MAY HAVE CHANGED BETWEEN YOUR ACCESS AND THE PUBLICATION OF YOUR WORK.

### Q: WHAT IF THE GEOGRAPHIC DATABASE DOESN'T HAVE A CLEAR AUTHOR OR PUBLISHER?

A: IF A GEOGRAPHIC DATABASE LACKS A CLEAR INDIVIDUAL AUTHOR OR PUBLISHER, LOOK FOR THE ORGANIZATION OR INSTITUTION RESPONSIBLE FOR ITS CREATION, MAINTENANCE, OR DISSEMINATION. THIS COULD BE A GOVERNMENT AGENCY, A RESEARCH LABORATORY, OR A UNIVERSITY DEPARTMENT. USE THE NAME OF THIS ENTITY AS THE AUTHOR OR PUBLISHER. IF NO CLEAR ORGANIZATIONAL ENTITY CAN BE IDENTIFIED, YOU MAY NEED TO DESCRIBE THE SOURCE MORE BROADLY BASED ON ITS ORIGIN.

## **Q: SHOULD I INCLUDE INFORMATION ABOUT THE FILE FORMAT (E.G., SHAPEFILE, GeoTIFF) IN MY CITATION?**

A: WHILE NOT ALWAYS STRICTLY REQUIRED BY CHICAGO STYLE, INCLUDING THE FILE FORMAT CAN BE BENEFICIAL FOR CLARITY AND REPRODUCIBILITY, ESPECIALLY IF THE FORMAT IS CRITICAL FOR ACCESSING OR PROCESSING THE DATA. IT'S PARTICULARLY HELPFUL IF THE DATASET IS AVAILABLE IN MULTIPLE FORMATS.

## **Q: HOW DO I CITE A PHYSICAL MAP IN CHICAGO STYLE?**

A: FOR A PHYSICAL MAP, YOUR CHICAGO STYLE CITATION SHOULD INCLUDE THE CARTOGRAPHER OR PUBLISHER, THE TITLE OF THE MAP, THE SCALE, THE PLACE OF PUBLICATION, THE PUBLISHER, AND THE YEAR OF PUBLICATION. DETAILS LIKE THE SPECIFIC EDITION OR PRINTING CAN BE ADDED IF THEY ARE SIGNIFICANT FOR YOUR RESEARCH.

## **Q: IS IT NECESSARY TO CITE THE METADATA OF A GEOGRAPHIC DATABASE?**

A: YES, IT IS HIGHLY RECOMMENDED TO CITE THE METADATA FOR GEOGRAPHIC DATABASES. METADATA PROVIDES CRUCIAL CONTEXT ABOUT THE DATA'S ORIGIN, COLLECTION METHODS, ACCURACY, AND LIMITATIONS. YOU CAN EITHER INCLUDE KEY METADATA ELEMENTS WITHIN YOUR CITATION OR REFERENCE THE METADATA DOCUMENT ITSELF, SIMILAR TO HOW YOU WOULD CITE A REPORT.

## **Q: HOW DO DOIs IMPACT THE CITATION OF GEOGRAPHIC DATABASES?**

A: DOIs (DIGITAL OBJECT IDENTIFIERS) ARE PERSISTENT IDENTIFIERS THAT PROVIDE A STABLE LINK TO ONLINE RESOURCES. IF A GEOGRAPHIC DATABASE HAS A DOI, YOU SHOULD ALWAYS INCLUDE IT IN YOUR CITATION AS IT GREATLY ENHANCES THE CHANCES THAT A READER CAN LOCATE THE EXACT DATA YOU USED, PROMOTING REPRODUCIBILITY.

## **Q: WHAT IS THE DIFFERENCE BETWEEN CITING A GEOGRAPHIC DATABASE AND CITING A GIS SOFTWARE?**

A: CITING A GEOGRAPHIC DATABASE REFERS TO THE SPECIFIC COLLECTION OF SPATIAL DATA YOU ARE USING (E.G., A DATASET OF ADMINISTRATIVE BOUNDARIES). CITING GIS SOFTWARE REFERS TO THE APPLICATION USED TO ANALYZE OR DISPLAY THAT DATA (E.G., ARCGIS OR QGIS). BOTH MAY NEED TO BE CITED IF THEY ARE INTEGRAL TO YOUR RESEARCH, BUT THEY ARE DISTINCT COMPONENTS.

## **Q: HOW DO I CITE GEOGRAPHIC DATA OBTAINED FROM A WEB SERVICE OR API?**

A: WHEN CITING GEOGRAPHIC DATA ACCESSED VIA A WEB SERVICE OR API, INCLUDE THE NAME OF THE SERVICE, THE PROVIDER, THE SPECIFIC DATA ENDPOINT OR LAYER ACCESSED (IF APPLICABLE), THE DATE OF ACCESS, AND THE URL OF THE SERVICE OR DOCUMENTATION. IF SPECIFIC DATA WAS DOWNLOADED OR EXTRACTED, TREAT IT AS A DIGITAL DATASET CITATION.

## **Q: WHAT IS THE GENERAL PHILOSOPHY BEHIND CHICAGO STYLE REFERENCING FOR COMPLEX DIGITAL RESOURCES LIKE GEOGRAPHIC DATABASES?**

A: THE GENERAL PHILOSOPHY OF CHICAGO STYLE FOR COMPLEX DIGITAL RESOURCES LIKE GEOGRAPHIC DATABASES IS TO PRIORITIZE CLARITY, SPECIFICITY, AND VERIFIABILITY. THE GOAL IS TO PROVIDE ENOUGH DETAIL SO THAT A READER CAN UNDERSTAND PRECISELY WHAT SOURCE WAS USED, WHERE IT CAME FROM, AND HOW TO POTENTIALLY ACCESS IT AGAIN, THEREBY SUPPORTING TRANSPARENCY AND REPRODUCIBILITY IN RESEARCH.

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