U.S. Army Corps of Engineers Information Resources

Federal Depository Library Conference

October 17, 2022

Professor Bert Chapman
Purdue University Libraries

PURDUE UNIVERSITY | Libraries and School of Information Studies

U.S. Army Corps of Engineers www.usace.army.mil/

Serves as #1 federal provider of outdoor recreation	National environmental engineer
Owns and operates over 600 dams.	Operates and maintains 12,000 miles of commercial inland navigation channels.
Dredges more than 200 million cubic yards of construction and maintenance dredge material annually.	Maintains 926 coastal, Great Lakes, and inland harbors.
Restores, creates, enhances or preserves tens of thousands of acres of wetlands annually under the Corps' Regulatory Program.	Provides a total water supply storage capacity of 329.2 million acre-feet in major Corps lakes
Owns and operates 24 percent of the U.S. hydropower capacity or 3 percent of the total U.S. electric capacity.	Supports Army & Air Force installations
Provides technical and construction support to more than 100 countries.	Manages an Army military construction program between 2006 and 2013 totaling approximately $44.6 billion — the largest construction effort since World War II.
Researches and develops technologies to protect the nation's environment and enhance quality of life.	

Army Corps Governing Legal Authorities

- 33 USC 400-426
- 5 USC 5947
- 10 USC 3513, 7233
- 15 USC 719e
- 16 USC 460, 793
- 40 USC 556
- 42 USC 1962
- 46 USC various areas
- 33 CFR 203-385
- 36 CFR 300-399, 800
- 40 CFR 22, 230, 233, 1500 et. seq.
- 50 CFR 400-499, 600

Army Corps History

- June 16, 1775-Continental Congress establishes provision for Chief Engineer in Continental Army.
- March 16, 1802 Army Corps established as separate branch.
- Engineers given responsibility for founding and operating U.S. Military Academy at West Point, NY. Until 1866, an Army Coprs Engineer was USMA superintendent.
- 1838-1863 Corps of Topographical Engineers supervises coastal fortification constructions and maps much of American West.
- Corps of Engineers also constructed lighthouses, helped develop jetties and piers for harbors, and carefully mapped the navigation channels.
- 19th century additional construction projects in U.S. (including national road) and Panama Canal in early 20th century.

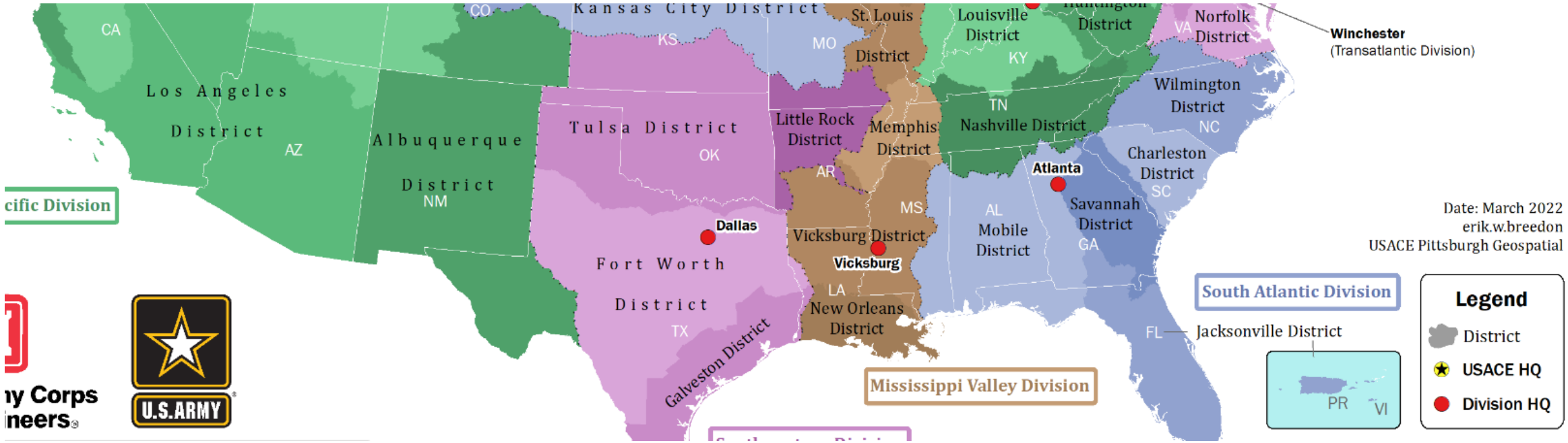
Army Corps History

- Active in Mexican and Civil War.
- Construction of various projects in Washington, DC and various national flood control projects-e.g. Ohio & Mississippi Rivers and National Parks such as Yellowstone.
- Extensive construction projects in France during World War I.
- Hydropower projects in the west during the 20th century including Pick-Sloan (Missouri River) and Columbia & Snake Rivers
- Construction of domestic and international military bases during World War II and subsequent conflicts. Missile sites, NASA facilities
- Increasing response to natural disasters since 1960s.
- Strong research and development contributions in mapping, hydrology, cold regions research, topography, erosion etc.
- Corps Motto: "Essayons"-French for "let us try."

Corps Organizational Structure

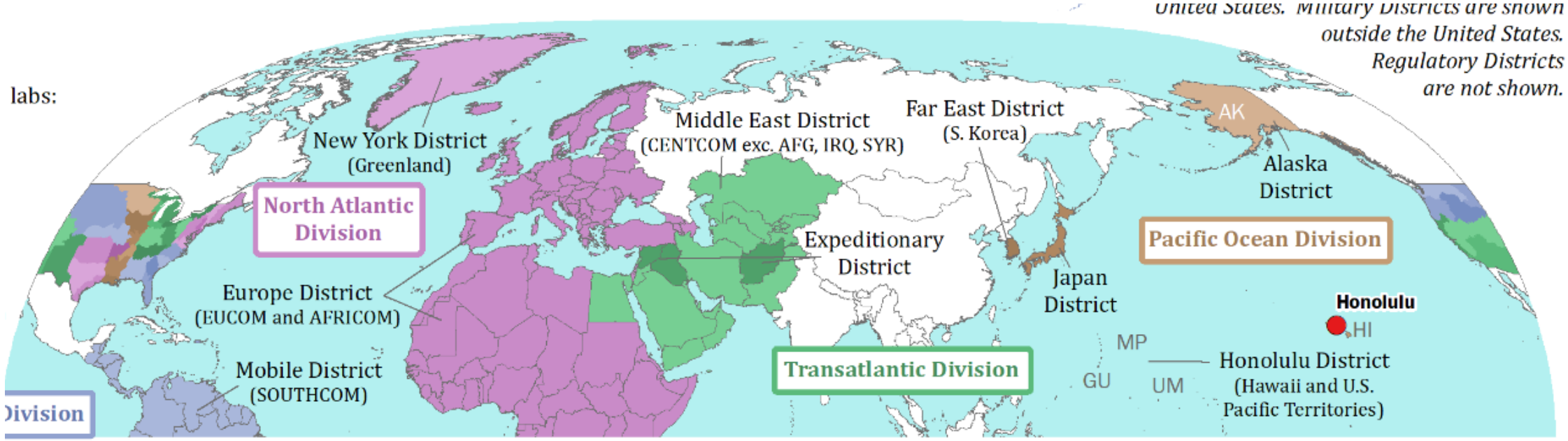
- Contracting
- Cost Engineering
- Counsel (Legal)
- Emergency Operations
- Engineering & Construction
- Engineering Inspector General
- History
- Logistics
- Military Missions
- Operational Protection Division
- Research & Development
- Contingency Response Unit

Corps Geographic Structure


CA
CO
Kansas City District
KS
MO
St. Louis District
Louisville District
KY
Norfolk District
VA
Winchester
(Transatlantic Division)
Los Angeles District
AZ
Albuquerque District
NM
Tulsa District
OK
Little Rock District
AR
Memphis District
TN
Nashville District
Wilmington District
NC
Charleston District
SC
Atlanta
Savannah District
GA
Dallas
Fort Worth District
TX
Vicksburg District
Vicksburg
MS
LA
New Orleans District
AL
Mobile District
Galveston District
FL
Jacksonville District
PR
VI
cific Division
Mississippi Valley Division
South Atlantic Division
Date: March 2022
erik.w.breedon
USACE Pittsburgh Geospatial
Legend
District
USACE HQ
Division HQ
U.S.ARMY

labs:

United States. Military Districts are shown outside the United States. Regulatory Districts are not shown.



- Great Lakes and Ohio River Division
  - Buffalo District
  - Chicago District
  - Detroit District
  - Huntington District
  - Louisville District
  - Nashville District
  - Pittsburgh District
- Mississippi Valley Division
  - Memphis District
  - New Orleans District
  - Rock Island District
  - St. Louis District
  - St. Paul District
  - Vicksburg District

- North Atlantic Division
  - Baltimore District
  - Europe District
  - New England District
  - New York District
  - Norfolk District
  - Philadelphia District
- Northwestern Division
  - Kansas City District
  - Omaha District
  - Portland District
  - Seattle District
  - Walla Walla District

- Pacific Ocean Division
  - Alaska District
  - Far East District
  - Honolulu District
  - Japan Engineer District
- South Atlantic Division
  - Charleston District
  - Jacksonville District
  - Mobile District
  - Savannah District
  - Wilmington District

- South Pacific Division
  - Albuquerque District
  - Los Angeles District
  - Sacramento District
  - San Francisco District

- Southwestern Division
  - Fort Worth District
  - Galveston District
  - Little Rock District
  - Tulsa District

- Transatlantic Division
  - Middle East District
  - Transatlantic Afghanistan District

The U.S. Army Corps of Engineers Transatlantic Division provides design, construction execution and related engineering services in direct support to U.S. Central Command and other activities within the USCENTCOM area of responsibility to establish the conditions for regional security and stability; and enables the U.S. Special Operations Command global construction program through centralized planning/programming on behalf of the U.S. Army Corps of Engineers Enterprise.

Centers of Expertise (Selected)

- Aircraft Hanger Fire Protection Center: providing the following functions: (1) Technical review of aircraft hangar designs performed by, or administered by USACE commands. (2) Review of contractor submittals, including equipment data, shop drawings, and calculations applicable to fire protection systems. (3) Assist USACE commands in conducting final acceptance testing of hangar fire protection systems. (4) Provide consultation services for design, installation, testing, and maintenance of aircraft hangar fire protection systems. (5) Develop technical guidance and guide specifications for hangar fire protection systems.
- Army Geospatial Center: provides a single focal point for the Army Geospatial Enterprise, focusing on all Army geospatial information and services functions from policy to warfighting. The AGC mission is to coordinate, integrate and synchronize geospatial information requirements and standards across the Army, develop and field geospatial enterprise enabled systems and capabilities to the Army and the Department of Defense, and to provide direct geospatial support and products to Warfighters.

Centers of Expertise (selected)

- Automated Performance Monitoring of Dams: providing the following functions: (1) ADVISORY ASSISTANCE FOR AUTOMATING MONITORING OF DAMS: Management of resources: programming, phasing and scheduling time, funds, expertise to obtain a functional product Determining the extent of automation Approach to data analysis Methods of procurement (2) TECHNICAL ASSISTANCE FOR AUTOMATING MONITORING OF DAMS: System planning; configuration, compatibility System design/specifications Review designs/specifications by others Assess new or existing instrumentation for proper functionality, location, automatibility. System installation and integration Data management: software integration, database development/conversion, training Maintenance: troubleshooting, recalibration, repair, replacement.

- Cold Regions: **CRDX combines the unique research capabilities of CRREL with the highly specialized cold regions design and construction expertise of the Alaska District**, resulting in a greatly enhanced capability to address cold regions' challenges across the USACE Civil Works, Military, Environmental, and Interagency and International Support Programs. This partnership will strongly contribute to the USACE campaign plan, supporting Army and MILCON Transformation by leveraging our organizations' combined skills to address DOD and USACE cold regions infrastructure needs. On the civil side of things, cold regions-specific challenges include permafrost impacts on shoreline erosion, sea ice processes, and river, glacial processes, and lake ice effects on hydrology, flooding, navigation, and port design.

Centers of Expertise (Selected)

- Curation/Mgmt Archaeological Collections
- The Curation and Management of Archaeological Collections Center (CMAC) MCX mission areas consist of the following: a. Curation of archaeological materials. b. Curation of associated documentation. c. Collections management. d. Collections management database development. e. Special purpose design and construction requirements of curation facilities. f. Assistance, when requested and on a cost-reimbursable basis, other Army major commands, Department of Defense services and agencies, and other federal, state, and local government agencies. g. Interagency coordination for the curation of archaeological collections.
- Environment & Munitions
- There are four divisions in the EM CX:
- - Environmental Engineering and Geology Division, CEHNC-CX-EG
- - Environmental Compliance and Management Division, CEHNC-CX-EC
- - Environmental Sciences Division, CEHNC-CX-ES
- - Military Munitions Division, CEHNC-CX-MM

Centers for Expertise (selected)

- Inland Navigation Design Center
- Provides engineering, design, analysis and review services for studies, new locks, new navigation dams, major rehabilitation of existing inland navigation locks and dams, and significant inland navigation lock and dam operations and maintenance projects. It's team of skilled specialists promote quality and consistency in design, and ensures technical competency for Corps projects and beyond.

- Institute for Water Resources
- Provides the following services: studying and evaluating water resources policy issues; conducting national-scope studies on various aspects of water resources development; examining potential new civil works missions; performing program analysis and evaluation studies; R&D of new techniques to address economic, social, institutional, and environmental issues; training and technical assistance in the use of innovative formulation and evaluation approaches; and, developing and maintaining navigation planning data bases and models.

CRREL

COLD REGIONS RESEARCH AND ENGINEERING LABORATORY

What we do:

The Cold Regions Research and Engineering Laboratory (CRREL) is one of the world's premier centers for research in the Earth's cold regions. For more than 60 years, we've helped the U.S. Army Corps of Engineers (USACE), the U.S. Army, the Department of Defense (DoD) and the Nation meet the challenges encountered in some of Earth's harshest and most austere cold region environments. We have a history of success at both the North and South poles, and with our unique cold regions expertise and facilities, we work to ensure the DoD and the Nation are prepared to operate in cold, complex and extreme environments.

- **Biogeochemical sciences**
- **Engineering resources**
- **Force projection and sustainment**
- **Terrestrial and cryospheric sciences**
- **Remote sensing and geographical information science (GIS)**
- **Signature physics**

WHY we do it:

Through basic and applied research, CRREL ensures USACE, DoD and the Nation are fully prepared and capable of maintaining our national security, addressing operational challenges and civil works interests in cold and extreme environments.

We deliver environmentally relevant and transformative engineering solutions to test, evaluate and improve infrastructure and equipment, particularly for use in cold regions. We quantify the effects of changing environmental conditions on installations, maneuver and materiel to sustain military and civil operations. We advance our knowledge of ice, snow and terrestrial behavior, mechanics and forces to shape the outcome in achieving mission success.

VISION:

We're developing innovative solutions for science and engineering challenges in extreme environments.

GOALS:

At ERDC's Cold Regions Research and Engineering Laboratory (CRREL), our mission is to solve interdisciplinary,

Our Facilities

Headquartered in Hanover, New Hampshire, and with resources in Alaska, we operate unique cold capable research facilities that deliver both knowledge and technical solutions. Explore our facilities:

- Cold Rooms Complex
- Frost Effects Research Facility
- Geophysical Research Facility
- Greenhouse
- Ice Adhesion Testing Facility
- Materials, Concrete, and Geotechnical Laboratories
- Materiel Evaluation Facility
- Permafrost Experiment Station
- Permafrost Tunnel Research Facility
- Remote Sensing/Geographic Information Systems Center

Permafrost Tunnel Research Facility

Available to study warm, ice-rich, fine-grained permafrost

U.S. ARMY CORPS OF ENGINEERS RESEARCH AND DEVELOPMENT CENTER (ERDC)

Published Nov. 19, 2012

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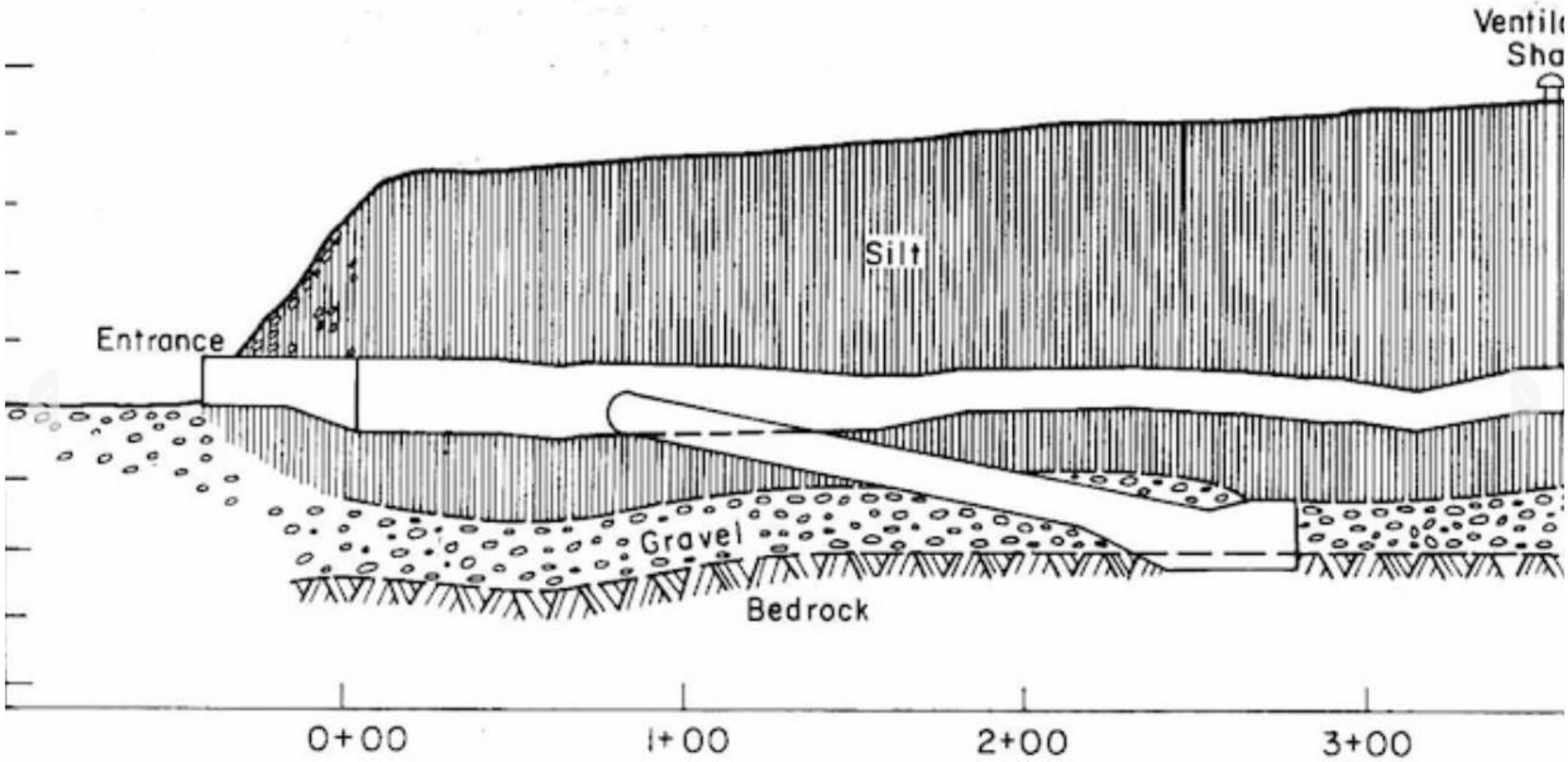


Detecting Sound in the Arctic

Matt Kamrath, a research physical scientist with the U.S. Army Engineer Research and Development Center's Cold Regions Research and Engineering Laboratory (CRREL), and Zach Zody, a CRREL research mechanical engineer, connect the cables from microphones to a multichannel recorder in Fairbanks, Alaska. The team carried microphones and recording equipment across fields covered in four feet of snow to conduct experiments and collect data for developing new methods for detecting, localizing and identifying aerial drones. The effort was completed in order to determine the direction of sound and the way it travels through the atmosphere as well as the way sound interacts with terrain in hopes of finding new methods for extracting information from sound signals.

US Army Corps
of Engineers
Cold Regions Research &
Engineering Laboratory

International Conference on

Snow Hydrology

The Integration of Physical, Chemical, and Biological Systems

Janet Hardy, Mary Albert, and Philip Marsh, Editors

August 1998

Institute for Water Resources

The U.S. Army Corps (USAC) Institute for Water Resources (IWR) was established to provide forward-looking analysis, cutting-edge methodologies, and innovative tools to aid USACE's Civil Works program. IWR strives to improve the performance of the USACE water resources program through analysis of emerging water resources trends and issues; development, distribution, and training in the use of state-of-the-art methods and models in the areas of planning, operations, and civil engineering; and national data management of results-oriented program and project information across Civil Works business lines.

IWR Mission Areas

- Coasts
- Collaboration and Public Participation
- Civil Works Planning and Policy Support
- Economics
- Emergency Management
- Environment
- Hydrology
- Flood Risk Management
- Navigation
- Regulatory
- Risk Analysis Gateway
- Training
- **Value to the Nation**
- Water Supply

NDC - Navigation and Civil Works Decision Support

The U.S. Army Corps of Engineers (USACE) has been authorized under the Rivers and Harbors Act to establish and maintain a variety of U.S. water transportation systems to support navigation. The Navigation and Civil Works Decision Support Center (NDC) is a technical center within the Institute for Water Resources (IWR) that provides navigation decision support to the USACE. NDC manages information systems that capture data for lock operations and navigation dredging projects.

Locks

NDC provides information on locks through the Lock Performance Monitoring System (LPMS), which is a web-based system used to collect and report data on vessels that traverse through Corps-owned or operated locks in near real-time. The primary purpose of the LPMS is to capture data relating to operations of locks, which acts as a planning tool for vessel operators and aids them in tracking progress of goods shipped on U.S. waterways. This information is then posted on Corps Locks.

Dredging

The Dredging Information System (DIS) provides dredging data and statistics to support decisions pertaining to the USACE national dredging program. The DIS is a full life-cycle database that captures information from planning to project closeout. USACE district staff input data for work completed using USACE and contracted dredges.
Currently we are in the process of redeveloping DIS to improve data entry, timely input of data and to reduce redundancy across USACE dredging data systems.
Check out our new public interface here, with more improvements to come.

Notices to Navigation Interests (NTNI)

The current NTNI website and process was introduced in 2015 as a way to provide centralized and standardized navigational information primarily about USACE projects to the industry and the public. Notices are published periodically as the need arises. A variety of information is provided within notices including:
•USACE work planned/in progress including maintenance dredging, lock maintenance, and work on jetties and breakwaters

Waterborne Commerce Statistics Center (WCSC)

WCSC is responsible for capturing information on vessels, tonnage, commodity, origin, and destination from vessel operating companies. This data and information is intended to assist USACE's navigation mission by providing statistics used to analyze the feasibility of new projects, and to set priorities for new investments and for the operation, rehabilitation, and maintenance of existing projects. Users of the data include government agencies, private industry, academia, and the general public.

US Army Corps of Engineers Institute for Water Resources

Waterborne Transportation Lines of the United States
The WTLUS Consolidated (Volumes 1-3)

The WTLUS Consolidated provides a summary of the vessel data detailed in the Waterborne Transportation Lines of the United States (WTLUS).
Summarized vessel characteristics are represented in both tabular and graphic format.
Provides a summary of vessel companies listed alphabetically by company name. Included in this publication are: the business address and telephone number, the Engineer District number, the TSOperator number (for usage in querying computer data), principal commodities carried, th points or localities and waterways between which or on which operated and the number of vessels reported by vessel type.

Data Dictionary

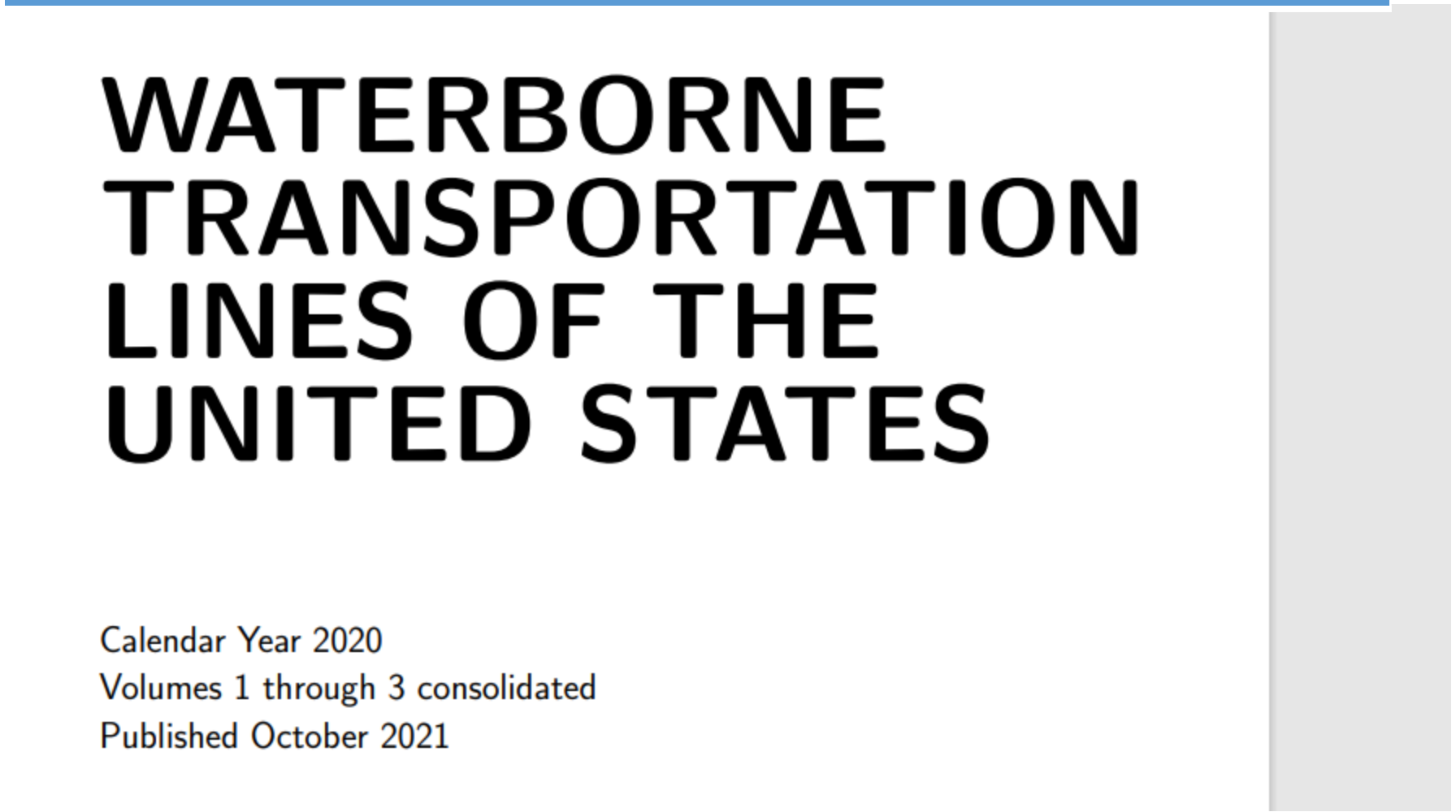
Lists the vessel companies alphabetically and describes each vessel surveyed by indication its name and number, Coast Guard number, type by ICST code (International Classification of Ships by Type; see appendix for code explanation), register and overall length and breadth, loaded and light draft, horsepower, carrying capacity in short tons or units of or units of cargo or number of passengers, height of fixed superstructures, cargo handling equipment, operating headquarters, and year built or rebuilt.

Files in Excel format

Download File:

WTLUS 2020 Consolidated (Volumes 1-3)
WTLUS 2019 Consolidated (Volumes 1-3)
WTLUS 2018 Consolidated (Volumes 1-3)
WTLUS 2017 Consolidated (Volumes 1-3)
WTLUS 2016 Consolidated (Volumes 1-3)

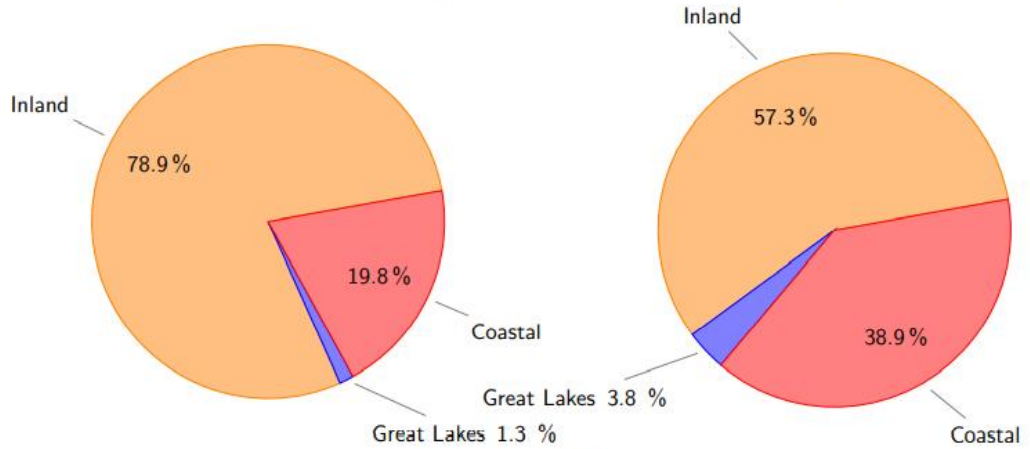
2,268 pages for 2020 edition!



Contents

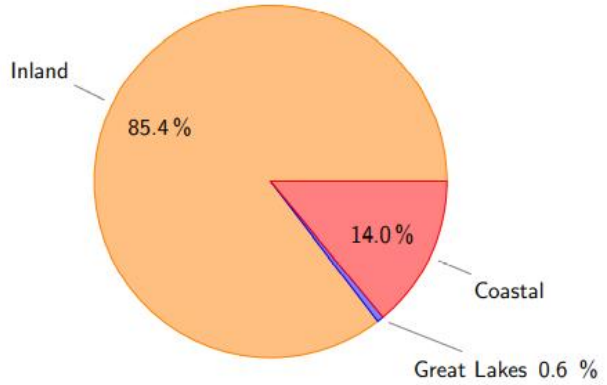
Summary of U.S. Flagged Vessels by Region

For historical reasons the United States vessel inventory has been divided into three regions. The largest region by number of vessels contained is the Inland Region consiting of the Mississippi River System combined with the Gulf Intracoastal Waterway (GIWW). The next largest region by number of vessels is the Coastal Region containing vessels based on the Gulf, Atlantic, and Pacific Coasts. The third significantly smaller region ranked by vessels contained is the Great Lakes region. The percentage of total vessels engaged in commerce, not including fishing, is displayed in Figure 1a. There were 35,224 vessels in the Inland Region, 8,845 vessels in the Coastal Region, and 593 vessels in the Great Lakes Region. Figure 1b shows the distribution of self-propelled vessels among the same regions with 5,921 vessels in the Inland Region, 4,018 vessels in the Coastal Region, and 394 vessels in the Great Lakes Region. Likewise, Figure 1c shows non self-propelled vessels by these regions with 29,183 vessels in the Inland Region, 4,785 vessels in the Coastal Region, and 199 vessels in the Great Lakes Region.



(a) All Vessels by Region

(b) Self-Propelled Vessels by Region



(c) Non Self-Propelled Vessels by Region

U.S. Flagged Vessels by Type

Type of Vessels	Total 2020	Atlantic, Gulf, and Pacific Coasts	Mississippi River System and the Gulf Intracoastal Waterway	Great Lakes System
Self-Propelled				
Dry Cargo not Container				
Number of Vessels	152	76	27	49
Horsepower	1,059,327	498,163	180,909	380,255
Cargo Capacity (short tons)	2,532,119	656,227	179,509	1,696,383
Container				
Number of Vessels	70	69	1	0
Horsepower	2,611,087	2,610,562	525	0
Cargo Capacity (short tons)	3,212,609	3,212,609	0	0
Offshore Supply				
Number of Vessels	1,846	479	1,364	3
Horsepower	5,589,921	1,611,201	3,977,480	1,240
Cargo Capacity (short tons)	1,549,708	572,987	976,636	85
Passenger Capacity	46,816	12,741	34,069	6
Ferries and Passenger Vessels				
Number of Vessels	1,804	1,412	219	173
Horsepower	9,563,083	6,486,725	2,936,172	140,186
Cargo Capacity (short tons)	235,486	209,221	22,369	3,896
Passenger Capacity	370,095	297,846	39,984	32,265
Tankers				
Number of Vessels	76	71	3	2
Horsepower	867,879	837,450	29,579	850
Cargo Capacity (short tons)	3,910,689	3,835,478	74,617	594
Towboats				
Number of Vessels	6,385	1,911	4,307	167
Horsepower	30,332,191	15,070,332	14,885,829	376,030
Cargo Capacity (short tons)	326,517	52,387	269,620	4,510

State	Total	State	Total	State	Total
Alabama	954	Alaska	400	American Samoa	6
Arizona	0	Arkansas	502	California	663
Colorado	2	Connecticut	240	Delaware	143
District of Columbia	2	Florida	811	Georgia	177
Guam	23	Hawaii	95	Idaho	26
Illinois	2,403	Indiana	3,286	Iowa	125
Kansas	114	Kentucky	3,834	Louisiana	8,522
Maine	102	Maryland	429	Massachusetts	775
Michigan	377	Minnesota	966	Mississippi	1,538
Missouri	2,619	Montana	117	Nebraska	15
Nevada	3	New Hampshire	17	New Jersey	736
New Mexico	0	New York	1,086	North Carolina	173
North Dakota	0	N. Mariana Islands	1	Ohio	575
Oklahoma	13	Oregon	257	Pennsylvania	2,070
Puerto Rico	67	Rhode Island	40	South Carolina	139
South Dakota	1	Tennessee	5,257	Texas	2,928
Utah	53	Vermont	17	Virgin Islands	39
Virginia	548	Washington	964	West Virginia	154
Wisconsin	180	Wyoming	1		

Table 15: Summary of the United States Fleet by State or Territory for 2020

CENTRAL MARINE LOGISTICS, INC.

District:26 Tel: (906) 630-6726
Address: 445 North Broad Street, Griffith, IN 46319-2223
Operating Localites include: Great Lakes: Indiana Harbor, IN - to Escanaba, MI; Port Inland, MI and Duluth, MN. The operator's fleet grouped by vessel type:
3 Bulk Carrier
The following table lists the individual vessels for this operator.

Table 784: **Vessels for CENTRAL MARINE LOGISTICS, INC.**

Name	ID	Year	Cap.	Length	Breadth	H Pt	Draft	Hp	Home Base
Self-Propelled Dry Cargo vessels of type Bulk Carrier with ICST code 229									
JOSEPH L. BLOCK	USCG:574870	1976	37572t	728.0	78.0	90.0	30.9[19.0]	7000	Griffith, IN
	IMO:7502320			Equipment: self-unloader					
STR EDWARD L. RYERSON	USCG:282106	1960	27500t	730.0[714.0]	75.0	106.0	28.3[20.0]	9000	Griffith, IN
	IMO:5097606								
STR WILFRED SYKES	USCG:259193	1949	24640t	678.0[661.1]	70.0	85.0	27.6[20.0]	7000	Griffith, IN
	IMO:5389554			Equipment: self-unloader					

SuDoc D 103

Headquarters/HECSA Library

Library services for the U.S. Army Corps of Engineers (USACE) Headquarters (HQ), Humphreys Engineer Center Support Activity (HECSA), Institute for Water Resources (IWR), 249th Engineer Battalion (Prime Power) and the Army Audit Agency (AAA) are provided by librarians assigned to HECSA. The HQ/HECSA Library has two physical locations, a reading room in the GAO Building and a larger repository in Alexandria, VA, and is one of the many libraries that comprise the USACE Library Program.

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Army Chief of Staff Reading List

Resources on the History of the US Army Corps of Engineers: Home

Information to find resources, including records, images, maps and more related to the history and heritage of the US Army Corps of Engineers

Researching Military Records?

The HQ/HECSA Library does not hold military records. Use this guide for researching military and civilian records.

Quick Link-Army History

- U.S. Army Center of Military History
  Center of Military History reports to Army Training and Doctrine Command; collects and disseminates Army history through its field history activities, historical studies, and collection of Army material culture.

Exhibits

Stanley Scott Persian Gulf Albums

Office of History, US Army Corps of Engineers, HQ

The Office of History at USACE, HQ collects and preserves the history and heritage of the U.S. Army Corps of Engineers. The office maintains an extensive artifact collection as well as primary sources including personal papers, journals, manuscripts, images, maps, oral histories, and books.

Library of Congress

- District of Columbia Office of the Surveyor
- Historic American Buildings Survey / Historic American Engineering Record / Historic American Landscapes Survey
- Maps from the 1860s and the Civil War related to U.S. Army Engineer Nathaniel Michler
- Maps from the Corps of Topographical Engineers
- Maps of World War II, 12th Army Group Engineer Section
- Prints and Photographs Online Catalog

National Archives

- Digital Content from the Office of the Chief Engineer (Record Group 77)
- Digitized Civil Works Map Collection from the Office of the Chief Engineer (Record Group 77)
- Military Maps Collection from the Office of the Chief Engineer (Record Group 77)
- Moving Images from the Office of the Chief Engineer (Record Group 77)
- Photographs from the Commission of Fine Arts (Record Group 66)
- Photographs from the Office of Public Buildings and Public Parks of the National Capital (Record Group 42)

Librarian

USACE Libraries
HQ/HECSA

Adriana Ercolano

Email Me

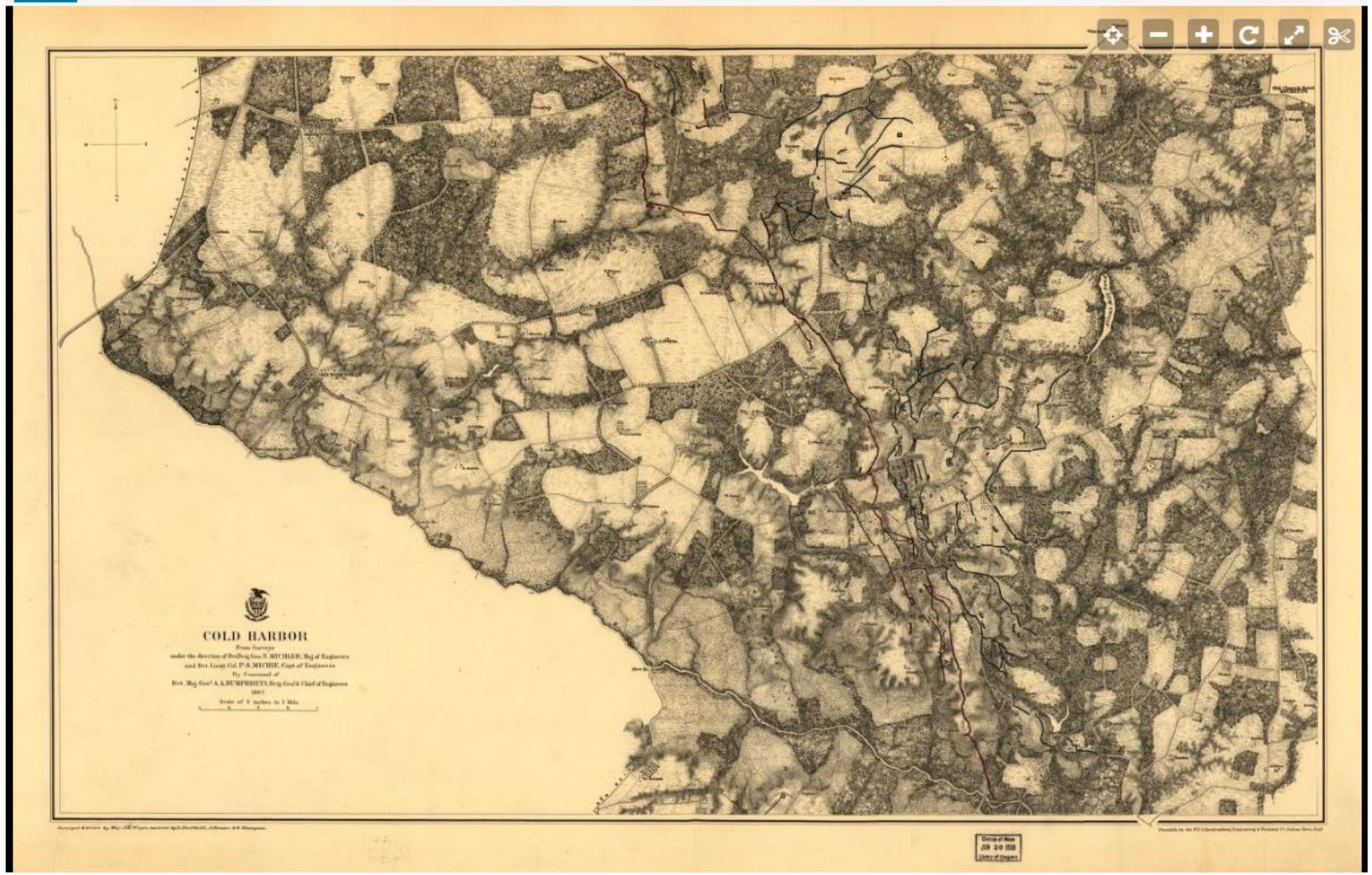
Contact:
USACE HQ
HECSA Library

MAP

Cold Harbor. [June 1-3, 1864] Copy 1

« About this Item

Image



National Archives photo of soldiers filling sandbags during Vanport Flood-Columbia River, near Portland, OR (June 3, 1948)

USACE GIS Data-Formerly Used Defense Sites (FUDS)

Presque Isle Air Force Base, ME

IRM Property Point

OBJECTID	260
DODFORMERLYUSEDDEFENSEIDPK	D01ME0050
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SDSFEATUREDESCRIPTION	PRESQUE ISLE AFB FUDS PROPERTY
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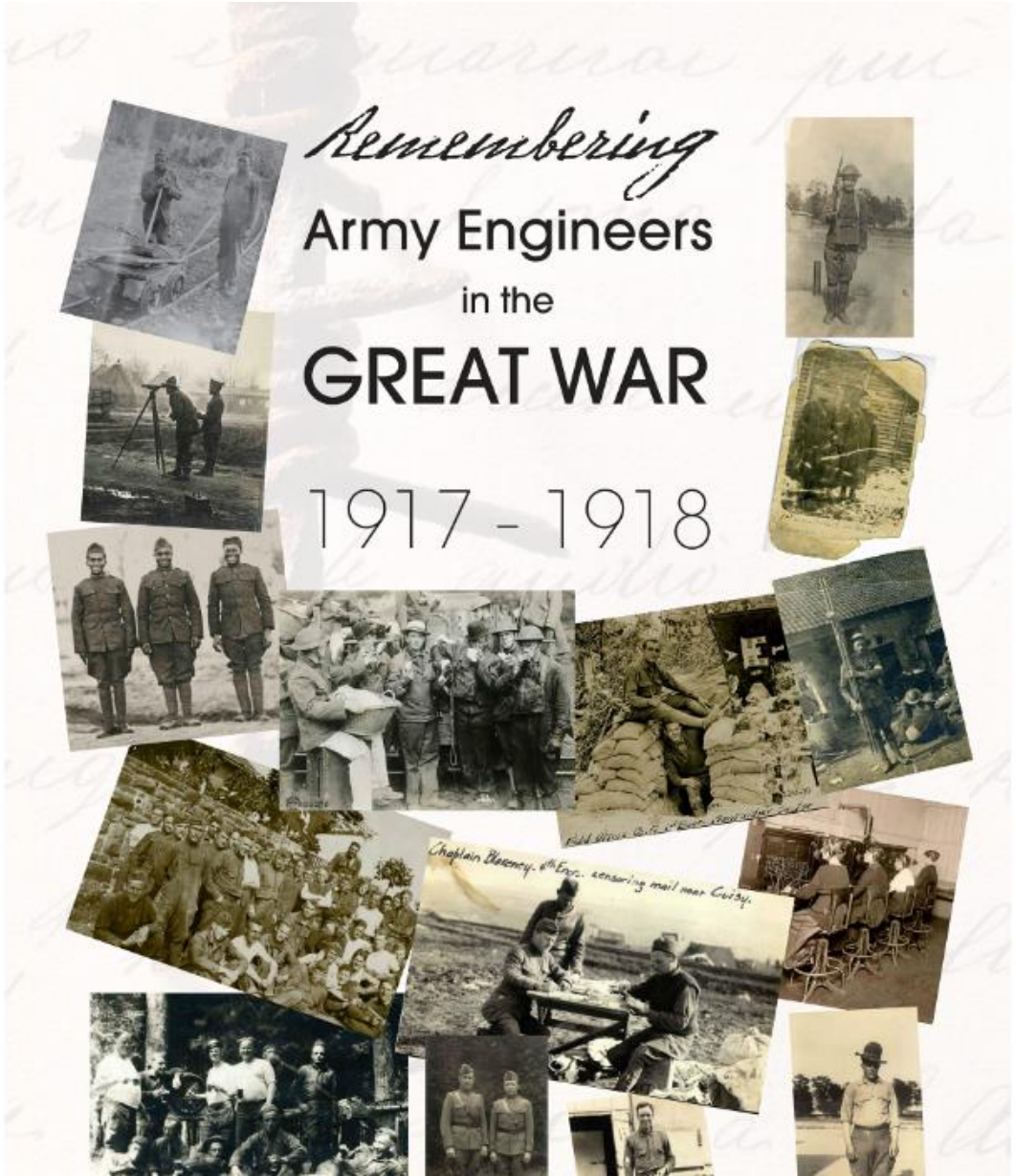
Army Corps Histories



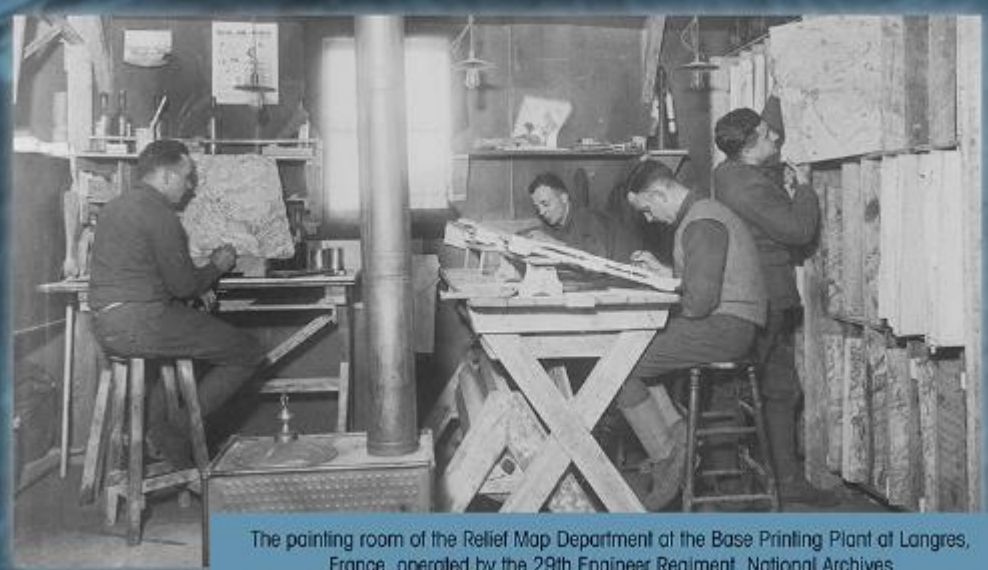
World War I Exhibit

The Office of History has developed this **virtual exhibit** to document the experience of U.S. Army Engineers in World War I. It is an on-line representation of a physical display that is open to USACE personnel and official visitors at USACE Headquarters in Washington, D.C. The physical exhibit consists of eight interpretive panels and almost fifty artifacts. The panels examine the role that Army Engineers played in Europe during the war. The objects offer a more personal glimpse of how Engineer soldiers lived and worked during the conflict and reflected on their wartime experiences in the decades after.

The photographs in this exhibit are from the Office of History's Image Collection or the National Archives and are in the public domain; all artifacts pictured are from this office's Historical Collection.

Mapping

By the start of America's involvement in World War I in 1917, the Corps of Engineers already had considerable experience making maps. Topographical engineers, known as "Topogs," had been responsible for conducting surveys of the United States' western territories during the nineteenth century that would serve as the basis for many of the nation's canal, road, and railroad projects. The challenge in France lay in the enormous number of maps needed to supply troops along the length of the Western Front, producing and delivering them quickly, and incorporating new technology, most notably aerial photography, into the process of making maps.



The painting room of the Relief Map Department at the Base Printing Plant at Langres, France, operated by the 29th Engineer Regiment. National Archives

GETTING THE LIGHTS BACK ON

The U.S. Army Corps of Engineers Responds to Hurricane Maria, 2017-2018

Jonah Bea-Taylor

Timeline: Puerto Rico Power Restoration	
2017	
August	**26** – Hurricane Harvey makes landfall in Texas.
September	**6** – Hurricane Irma makes landfall in the U.S. Virgin Islands and Puerto Rico. **10** – Hurricane Irma makes landfall in the Florida keys. **20** – Hurricane Maria makes landfall in Puerto Rico. **30** – Official start of the U.S. Army Corps of Engineers power restoration mission.
October	**1** – Approximately 5% of Puerto Rico Electric Power Authority (PREPA) normal peak electric load restored. **11** – Corps places first order for replacement parts on the bill of materials. **16-18** – Corps awards first grid repair contracts to Fluor and PowerSecure. **20** – One month post-landfall; 19% of normal peak load restored. **30** – Large gas turbine generators begin operating at Palo Seco power plant to stabilize power for the San Juan area. **31** – PREPA officially requests mutual assistance from other power companies.
November	**7** – USNS *Brittin* arrives with critical equipment and some of the first order of parts on the bill of materials. **23-27** – Unified Command makes major reassessment of the parts needed to complete the bill of materials.
December	**4-6** – Increase of initial grid repair contracts to $461 million and award of additional contract to Fluor for $495 million to dramatically increase capacity. **20** – Three months post-landfall; 65% of normal peak load restored.
2018	
January	**12-27** – The number of critical parts (poles, wire) available in Puerto Rico for installation on the grid doubles.
February	**5-26** – Period of peak rate of power restoration; highest number of line crews (nearly 6,000 workers) and Corps personnel in Puerto Rico.

Published 1981

Engineers of Independence

A Documentary History of the Army Engineers in the American Revolution, 1775-1783

Paul K. Walker

SÉBASTIEN LE PRESTRE DE VAUBAN. *Most of the foreign engineers in the Continental Army had studied the principles of this master of military engineering at the great French engineering school at Mézières.*
Library of Congress

Royale du Génie, founded in 1749 at Mézières. This program combined theoretical instruction with practical exercise.[9]

At Mézières, the young officers still keenly felt the influence of Sébastien le Prestre de Vauban, the great seventeenth-century French engineer and

1633-1707-French military engineer who revolutionized siegecraft & military fortifications. Significant influence on Army Corps practice.

Army Corps also influenced by British military engineering.

12 of Vauban’s fortifications in various areas of France are UNESCO World Heritage Sites

3. AGREEMENT BETWEEN DEANE AND COUDRAY FOR SERVICE IN THE CONTINENTAL ARMY

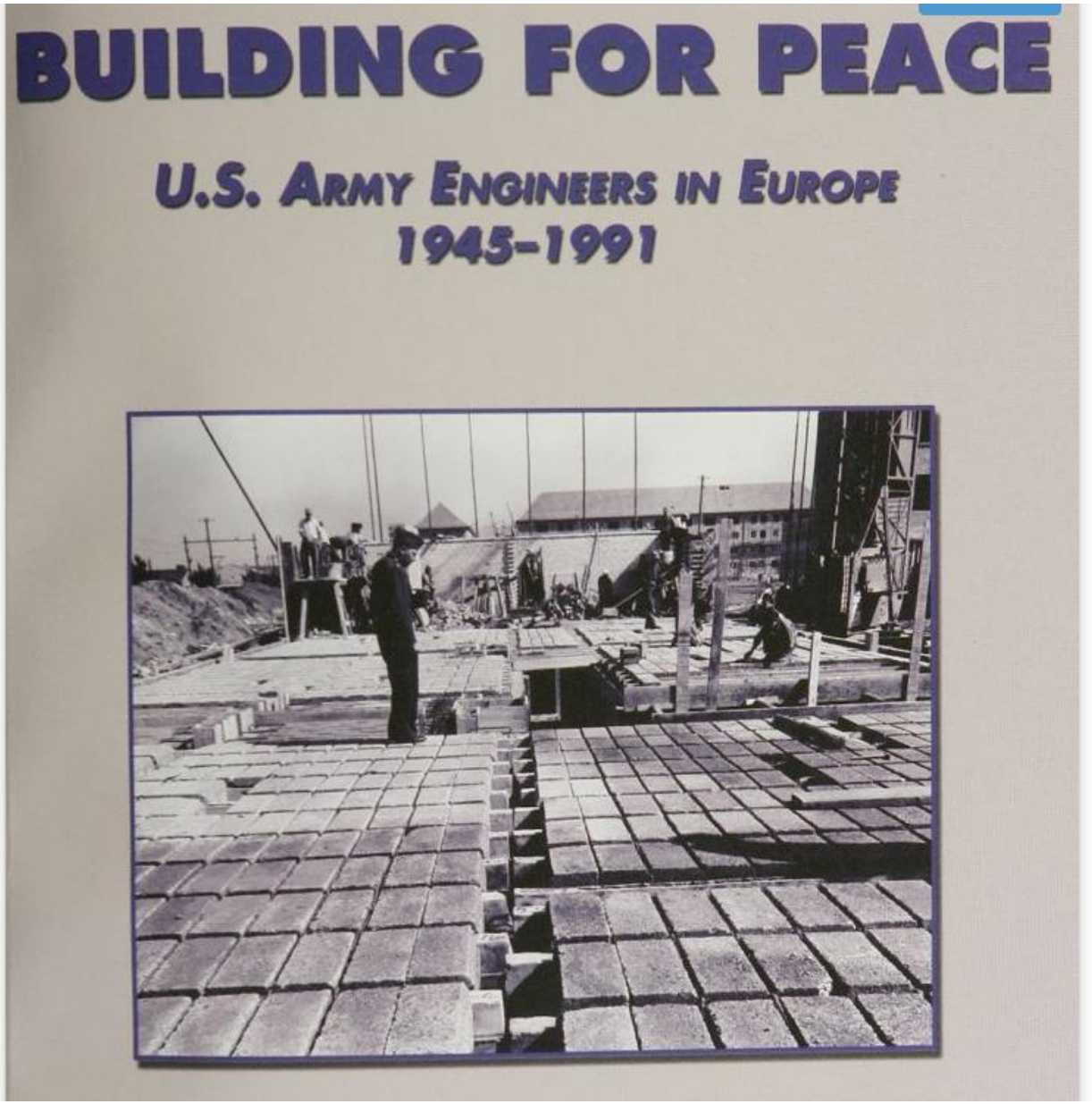
September 11, 1776

1. The Sieur Du Coudray, under title of General of Artillery and Ordnance, and in rank of Major-General in the Forces of the United Colonies, shall have the direction of whatever relates to the Artillery and Corps of Engineers, under the order and control only of the Congress of the United Colonies, their Committee of War, or the Commander-in-Chief for the time being.

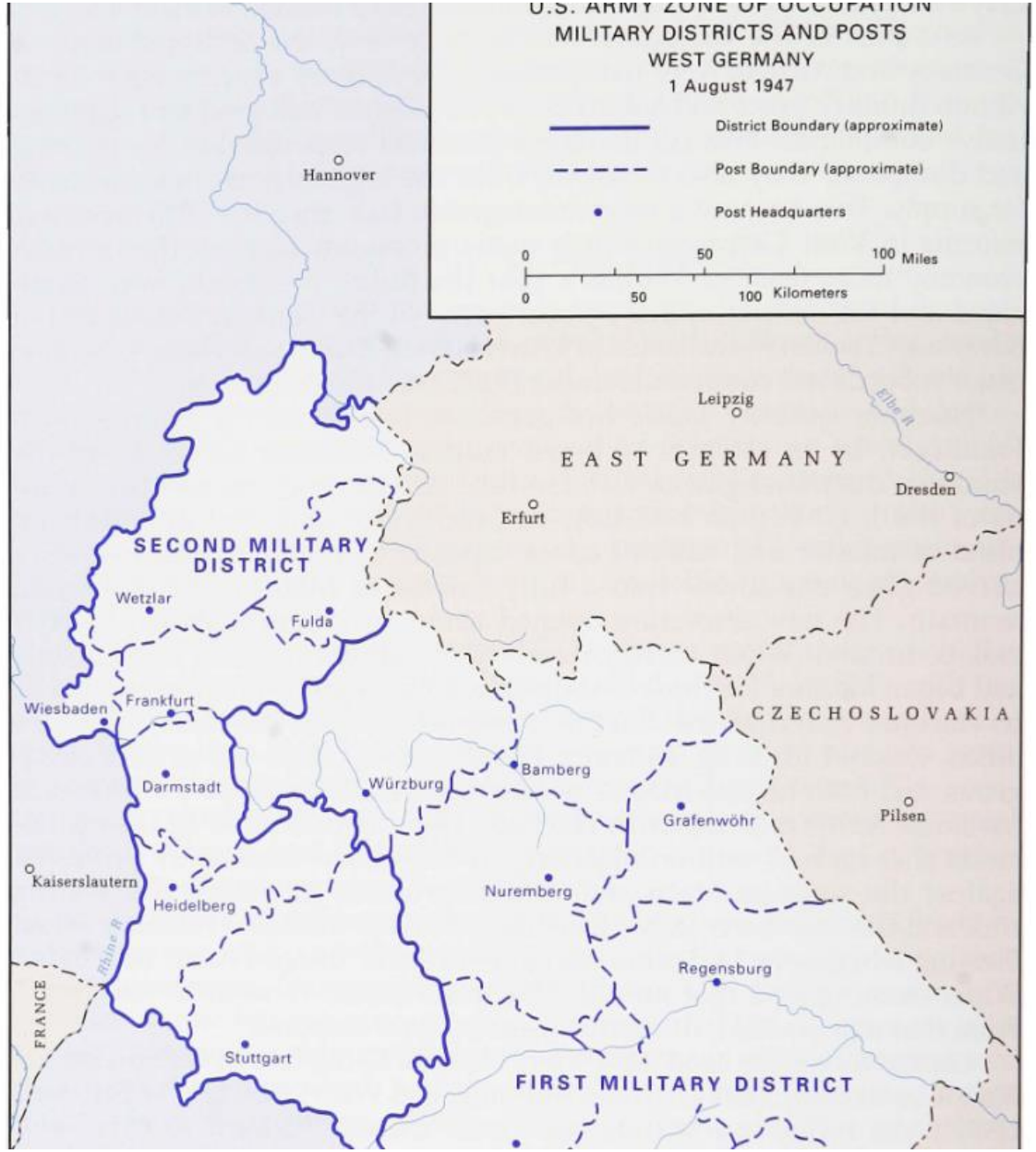
2. The Corps of Artillery and Engineers, as well officers as soldiers composing the same, shall be under his immediate command, with all the privileges and authority annexed to such command respecting either rewards or punishments, and in case of vacancy in said corps by death, removal, or new creations, it shall be for him to recommend to the Congress, or their Committee of War, the persons proper for filling the same.

3. Whatever relates to the supplying the said corps with provision, to the construction of artillery and fortification, to any plan or scheme relative to these objects, will be consulted on with him, and the execution of whatever may be agreed on committed to him, as within his department.

Published 2005; Digitized 2012



Postwar Reconstruction, 1945–1949


U.S. ARMY ZONE OF OCCUPATION
MILITARY DISTRICTS AND POSTS
WEST GERMANY
1 August 1947
District Boundary (approximate)
Post Boundary (approximate)
Post Headquarters
0 50 100 Miles
0 50 100 Kilometers
Hannover
Leipzig
Elbe R.
EAST GERMANY
Dresden
Erfurt
SECOND MILITARY DISTRICT
Wetzlar
Fulda
Wiesbaden
Frankfurt
CZECHOSLOVAKIA
Bamberg
Darmstadt
Würzburg
Grafenwöhr
Pilsen
Kaiserslautern
Heidelberg
Nuremberg
Rhine R.
Regensburg
FRANCE
Stuttgart
FIRST MILITARY DISTRICT

Section on 1948 Berlin Airlift

repairs on the runway went on around the clock and made continuous landings possible. The teams worked unceasingly until the first of the new runways was completed.[78]

In the first week of July 1948, Col. Reginald Whitaker, engineer officer at the Berlin Military Post, received orders to build a new runway in Tempelhof. On 8 July work began on an airstrip that was to be 5,500 feet long and 140 feet wide. Two months later, on 8 September, planes began landing on the new runway. A third runway in Tempelhof, started on 23 August, opened in November.[79]

Even with the additional runways, the facilities in Tempelhof were not adequate to sustain the airlift. The airfield's location among tall buildings made landings difficult and dangerous. The recommended approach angle for landing aircraft was one vertical unit for every forty horizontal units. The best angle that could be achieved in Tempelhof was one to sixteen! The glide angle was so sharp that as a safety measure engineers dug a trench at the end of the principal runway so that planes overshooting it would sheer off their landing gear and thus slow down enough to prevent them from crashing into the administrative buildings.[80]

In addition to the liability of the glide angle, the facilities could not accommodate the high volume of air traffic. Because Gatow Airfield in the British sector could not be expanded, the pressures of the blockade made a completely new airfield necessary. An engineer team identified an appropriate site in the Tegel area of the French sector, near rail facilities and unobstructed by tall structures. The French agreed to let the Americans build, staff, and maintain a field for the duration of the Berlin Blockade. General Clay approved the construction of the new airport on 31 July 1948. Lt. Gen. Curtis E. LeMay, commander of the U.S. Air Force

REPORTS OF THE CHIEF OF TOPOGRAPHICAL ENGINEERS

1848, 1849 & 1850

REPORT OF THE CHIEF, TOPOGRAPHICAL ENGINEERS.

BUREAU OF TOPOGRAPHICAL ENGINEERS.
Washington, November 17, 1848.

SIR: In conformity with established usage, I have the honor to submit the following annual report of the operations of the corps since the last report, and an estimate for the duties for the ensuing year.

The peace with Mexico returned to the United States the large proportion of the officers of the corps which had been employed with the army in that country. The greater part of these were maimed with wounds, or sick from the fatigues and exposures which their duties required. Of their services in Mexico it is not necessary that I should speak. The reports of commanding officers pay frequent and brilliant compliments to their services, and the brevets which have been bestowed attest an accordance of the judgment of the Executive with these compliments. But, in addition to their regular corps duties, several of the corps occupied and exercised important military commands. Captain J. E. Johnston, of the corps, now brevet colonel in the army, in the exercise of his corps

As before remarked, the commands of Oregon, California, New Mexico, and Texas, have to be supplied with officers of the corps, and surveys have to be made in those commands.

I therefore respectfully submit for consideration—

For military surveys in Oregon	$10,000
For military surveys in California	10,000
For military surveys in New Mexico	10,000
For military surveys in Texas, and from the navigable waters of the Red River to the Rio Grande	15,000

Use Measuring Worth - Relative Worth Comparators and Data Sets to convert historical U.S. dollars to present.

We present here specific "Definitions of Relative Worth" for the combinations of each of the seven indexes applied to each of the three types of items.

Item / Measure	Commodity	Income or Wealth	Project
Price Index	real price $354,000.00	real wage or real wealth $354,000.00	real cost $259,000.00

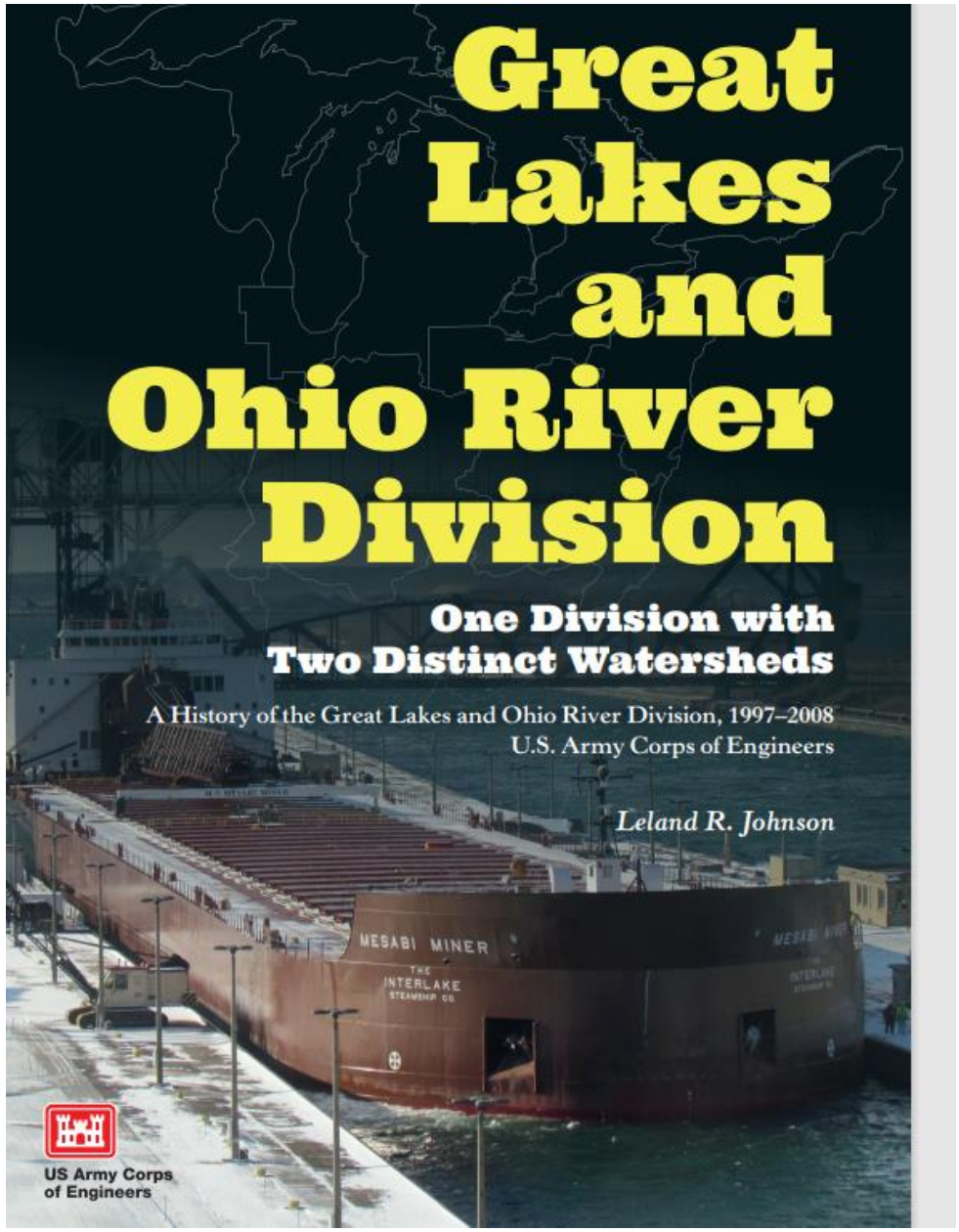
Results for $10,000 expenditure through 2021 via September 21, 2022 Measuringworth.com search.

Light-house on Minot's Rock, Boston harbor.

This has been a work of extreme difficulty, and of no little danger, and the results are a singular exhibition of the triumphs of perseverance and mechanical ingenuity. The rock is exposed to the whole burst of the Atlantic wave. A small portion of it, involving a circular area, rarely exceeding 25 feet in diameter, is bare at low water and during very calm weather. But no part of this area is more than three feet above extreme low water, and during slight winds the sea breaks over the whole with great violence. Upon this small and extremely exposed position, a footing had to be obtained, and holes had to be drilled in the rock, in which were to be inserted the iron piles to sustain the structure. This short description will sufficiently apprise all those who have any knowledge of a sea shore of the serious and continued difficulties of working on such a place. It gives me great pleasure to add that no lives have yet been lost in the work, although there have been several accidents, and additional pleasure to say that all the piles to sustain the work have been established, as well as the skeleton iron frame of the top, intended to connect the piles and to sustain the keeper's house and lantern. All serious difficulties are therefore overcome.

The work has been under the superintendence of Captain Swift of the corps, and the resident agent and contractor was Mr. Benjamin Pomeroy, a person of the most extraordinary perseverance and inexhaustible ingenuity, and well acquainted with working in such positions. The report of Captain Swift is hereto added as an appendix. A small appropriation of 4,500 dollars is now required to procure and complete the illuminating apparatus for this light-house, which I believe will be found to be one of the most useful on that coast.

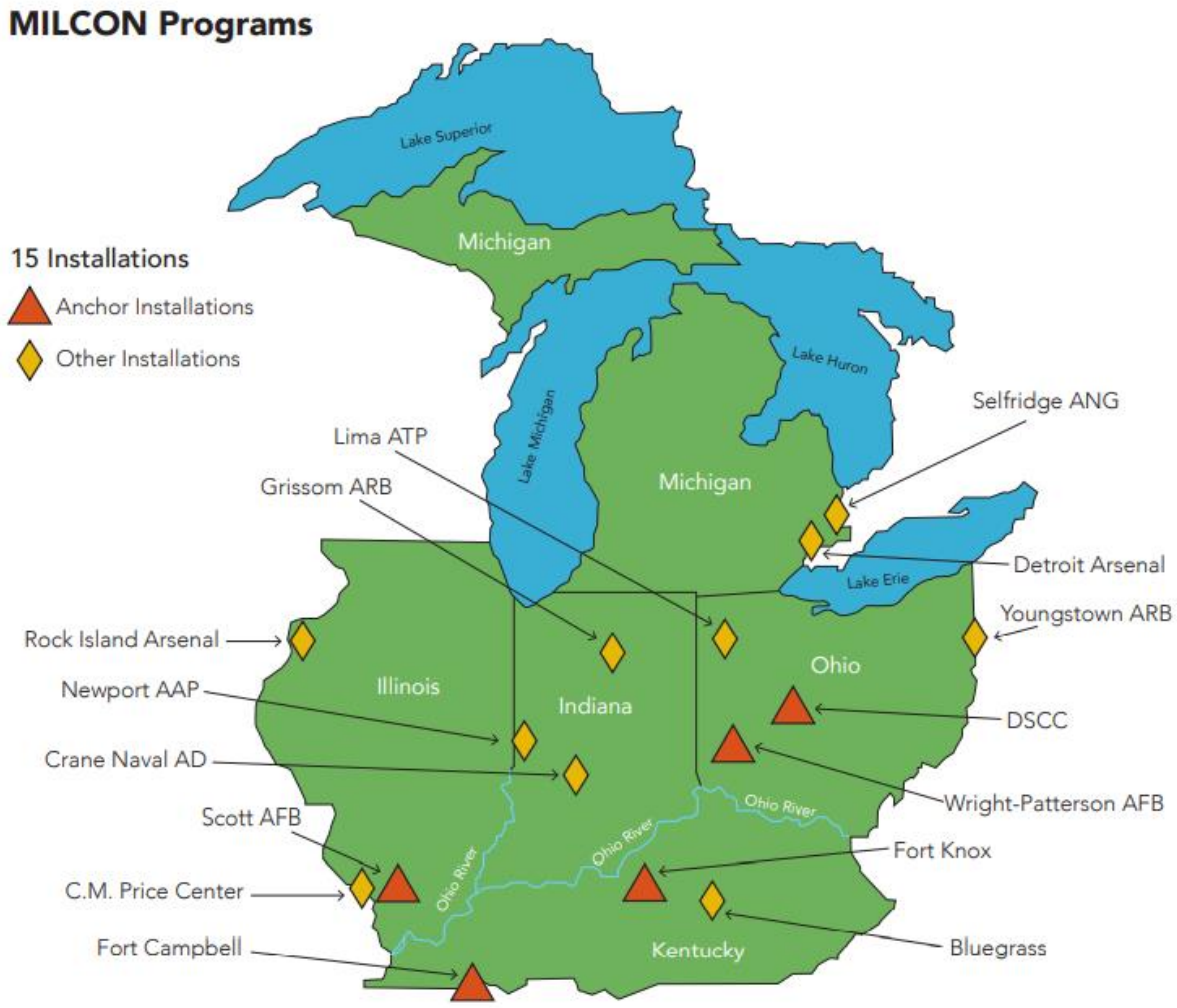
Published 2017; Digitized 2020-Regional Corps History



Contents

Restoring Chicago's shoreline protection (Chicago District)

control, and urban riverine restoration, plus one navigation lock on the city's spectacular lakefront. Although it was a small district, Chicago's engineering was among the most innovative in the Corps.

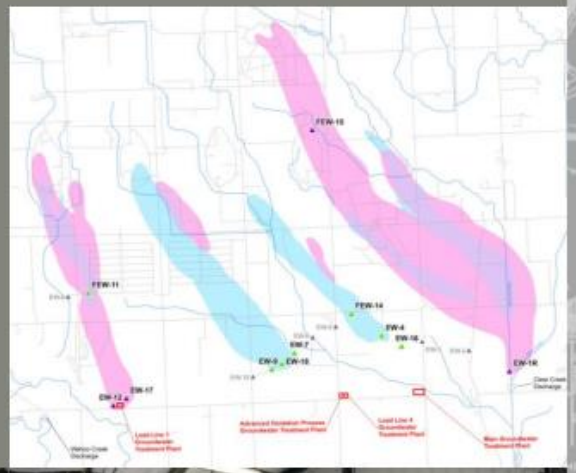


through an occupied city presented different sets of problems. In cities, tanks become moving targets and if their paths are blocked they become stationary targets. Most urban infantry ranges consisted of stripped and empty stone walls and roofs, but the Fort Knox mounted vehicle range comprised a 26-acre city equipped with dozens of buildings, parking lots, a power station, a junkyard, and even a soccer field and town fountain. All these sites were wired to computers, laser engagement sensors, and special effects to create warlike obstacles

Army Corps Policy Manuals

2018 CONTAINMENT EVALUATION

Brad Brink
US Army Corps of Engineers
20 Nov 2019



"The views, opinions and findings contained in this report are those of the authors(s) and should not be construed as an official Department of the Army position, policy or decision, unless so designated by other official documentation."

US Army Corps of Engineers.

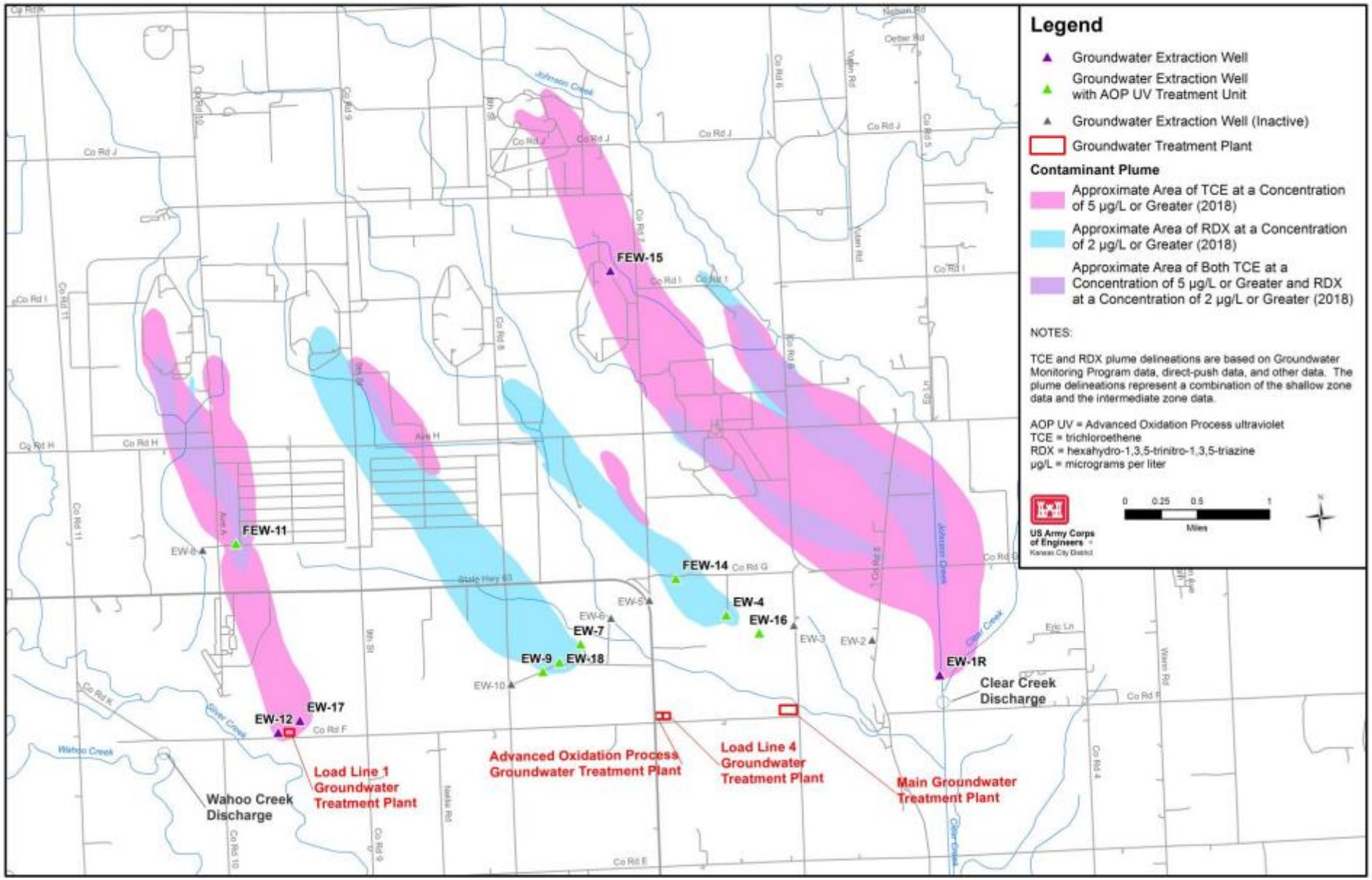
U.S.ARMY

THE CONTAINMENT EVALUATION

- U.S. Army Corps of Engineers evaluates containment annually at the former Nebraska Ordnance Plant site.

- Determines whether the hydraulic containment system is capturing the Operable Unit 2 Record of Decision contaminants of concern in groundwater that are above the Final Target Groundwater Cleanup Goals.

HYDRAULIC CONTAINMENT SYSTEM



CEMP-RT Engineer Manual 200-1-4	Department of the Army U.S. Army Corps of Engineers Washington, DC 20314-1000	EM 200-1-4 31 January 1999
	Environmental Quality RISK ASSESSMENT HANDBOOK VOLUME I: HUMAN HEALTH EVALUATION	
	Distribution Restriction Statement Approved for public release; distribution is unlimited.	

Environmental Quality
RISK ASSESSMENT HANDBOOK
VOLUME I: HUMAN HEALTH EVALUATION

1. Purpose. The overall objective of this manual is to provide risk assessors with the recommended basic/minimum requirements for developing scopes of work, evaluating Architect-Engineer (A-E) prepared human health risk assessments, and documenting risk management options associated with Hazardous, Toxic, and Radioactive Waste (HTRW) investigations, studies, and designs consistent with principles of good science in defining the quality of risk assessments. This EM is intended for use by U.S. Army Corps of Engineers (USACE) Project Managers, technical personnel, and contractor personnel.

2. Applicability. This EM applies to all HQUSACE elements and USACE commands responsible for HTRW projects.

3. References. References are listed in Appendix A.

4. Distribution. Approved for public release, distribution is unlimited.

5. Discussion. This manual is intended to provide USACE risk assessors and contractor personnel with supplemental guidance for performance and evaluation of risk assessments under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, and the Resource Conservation and Recovery Act (RCRA) as amended by the Hazardous and Solid Waste Amendments (HSWA) of 1984. It is not intended to replace the accepted guidance by the USEPA (e.g., *Risk Assessment Guidance for Superfund, Human Health Evaluation Manual*), but should be used in conjunction with that document. Additional information provided by this manual concerns presentation of the risk assessment results for use in risk management and decision-making, concerns focusing on the decisions, and criteria needed for decisions. Both risk and nonrisk factors are presented for consideration by the risk managers.

Environmental Quality

RISK ASSESSMENT HANDBOOK, VOLUME I: HUMAN HEALTH EVALUATION

Table of Contents

1.2.2 BRAC. BRAC is an environmental restoration program with the mission to restore or clean up DOD installations in preparation of real property disposal or transfer. The Base Closure Account (BCA) funds the BRAC program. The BCA is authorized under the Defense Authorization Amendments and Base Closure and Realignment Act of 1988 and the Defense Base Closure and Realignment Act of 1990. These funds are used to define the nature and scope of contamination, perform RA, and document the condition of real property by issuance of the Finding of Suitability to Lease (FOSL) (DOD, 1993) and the Finding of Suitability to Transfer (FOST) (DOD, 1994a). The Community Environmental Response Facilitation Act (CERFA) (Public Law 102-426) amends CERCLA Section 120(h) and requires Federal agencies to define "real property" on which no hazardous substances and no petroleum products or their derivatives were stored for 1 year or more, were known to have been released, or were disposed of before the property can be transferred. Transfer of contaminated property is allowed as long as the RA to clean up the site is demonstrated to be effective to EPA.

US Army Corps
of Engineers®

EM 385-1-80
30 September 2013

SAFETY

RADIATION PROTECTION

Table of Contents

3-2. Radioactive Decay.

a. Depending upon the ratio of neutrons to protons within its nucleus, an isotope of a particular element may be stable or unstable. Over time, the nuclei of unstable isotopes spontaneously disintegrate or transform in a process known as radioactive decay or radioactivity. As part of this process, various types of ionizing radiation may be emitted from the nucleus. Nuclides which undergo radioactive decay are called radionuclides. This is a general term as opposed to the term radioisotope which is used to describe an isotopic relationship. For example, ^{3}H, ^{14}C, and ^{125}I are radionuclides. Tritium (^{3}H), on the other hand, is a radioisotope of hydrogen.

b. Many radionuclides such as radium-226, potassium-40, thorium-232, and uranium-238 occur naturally in the environment while others such as phosphorus-32 or sodium-22 are primarily produced in nuclear reactors or particle accelerators. Any material which contains measurable amounts of one or more radionuclides is referred to as a radioactive material. As any handful of soil or plant material will contain some

EM 1110-1-1905	CECW-EG	Bearing Capacity of Soils	10/30/1992		
EM 1110-1-2009	CECW-EG	Architectural Concrete	10/31/1997		
EM 1110-1-2907	CECW-EG	Rock Reinforcement	2/15/1980		
EM 1110-1-2908	CECW-EG	Rock Foundations	11/30/1994		
EM 1110-1-2909	CECW-CE	Geospatial Data and Systems	9/1/2012		
EM 1110-1-2910	CECW-CE	Remote Sensing	3/10/2021		
EM 1110-1-3500	CECW-EG	Chemical Grouting	1/31/1995		
EM 1110-1-4006	CEMP-RT	Removal of Underground Storage Tanks (USTs)	9/30/1998		
EM 1110-1-4008	CEMP-RA	Liquid Process Piping	5/5/1999		

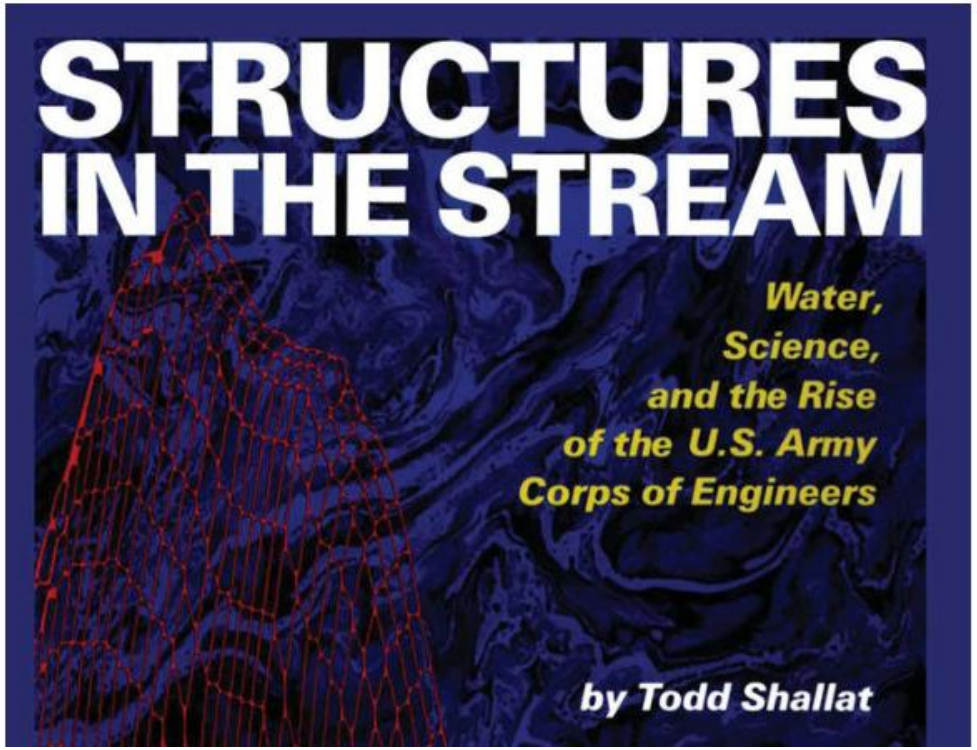
Army Corps Controversies

- Program cost overruns
- Adverse environmental impacts in areas such as dam construction, water quality, American Indian treaty rights etc.
- Being excessively responsive to congressional “pork barrel” projects.
- Corps has needed to increasingly account for environmental impact of its projects
- Having to consider non-structural impacts to solve water problems
- Criticism for New Orleans levee systems before and after Hurricane Katrina
- Ruled to have violated National Environmental Policy Act in constructing Dakota Access Pipeline by U.S. District Court for District of Columbia. Often subject of litigation for various reasons.

Critics have long denounced the "pork-barrel" ties that bind the Corps to the Senate and House. Courtesy of the *Arkansas Democratic Gazette* and George Fisher.

Sample Work on Army Corps History

- Todd Shallat. *Structures in the Stream: Water, Science, & the Rise of the U.S. Army Corps of Engineers*. Austin: University of Texas Press, 1994.-Previous slide cartoon featured in this work.



Army Corps Congressional Oversight & Funding

- House Appropriations Committee-Military Construction, Veterans Affairs, & Related Agencies Subcommittee
- …Subcommittee on Energy, Water Development, & Related Agencies.
- House Armed Services Committee
- House Transportation Infrastructure Committee
- Senate Appropriations Committee-Military Construction, Veterans Affairs, & Related Agencies Subcommittee.
- ….Subcommittee on Energy & Water Development.
- Senate Armed Services Committee
- Senate Environment & Public Works Committee

Some Army Corps Publications are in GovInfo's House Documents Series

These two documents have a cululative total of 2,135 pages

116th Congress, 1st Session – – – – – – – – – – – – – – – House Document 116–69

SOUTHWEST COASTAL LOUISIANA INTEGRATED FINAL FEASIBILITY REPORT AND ENVIRONMENTAL IMPACT STATEMENT

COMMUNICATION

FROM

THE ASSISTANT SECRETARY OF THE ARMY, CIVIL WORKS, THE DEPARTMENT OF DEFENSE

TRANSMITTING

THE CORPS' SOUTHWEST COASTAL LOUISIANA INTEGRATED FINAL FEASIBILITY REPORT AND ENVIRONMENTAL IMPACT STATEMENT FOR APRIL 2016

PART 2 OF 2

		alignments for storm surge			
8	114a	LA Highway 333/82 Hurricane Protection	N/A	Mermentau	Vermilion Parish
9	114b	LA Highway 330 Hurricane Protection	N/A	Mermentau	Vermilion Parish
10	141	Four Mile Canal Structure (V3)	N/A	Mermentau	Vermilion Parish Plan
11	142	Hebert Canal Watershed/storm protection (V5)	N/A	Mermentau	Vermilion Parish Plan
12	143	Flood Control Structure at Oaks Canal (V8)	N/A	Mermentau	Vermilion Parish Plan
13	144a	Extension of Protection Levee on the marsh/upland interface (V6) to GIWW West of Forked Island	Protection Levee on the marsh/ upland interface	Mermentau	Vermilion Parish Plan
14	144b	Protection Levee on the marsh/upland interface (V6)			
15	144c	Extension of Protection Levee on the marsh/upland interface (V6) to Delcambre Canal			
16	146	Gueydan 100 yr ring levee protection PU4_fl_1000_3	Gueydan ring levee	Mermentau	LACPR
17	149a	C-RL-1000-1 Lake Charles Ring Levee/CL-RL-100-1/CL-RL-400-1 (on same footprint)	Lake Charles ring levee	Calcasieu-Sabine	LACPR
18	150	Continuous levee along the GIWW from Vermilion Bay to west of Vinton		Calcasieu-Sabine, Mermentau	
19	155	100-year levee along the GIWW and 500-year ring levee around Vinton/Lake Charles.		Calcasieu-Sabine	

categories. The depth-damage relationships for vehicles were developed based on interviews with the owners of automobile dealerships that had experienced flood damages and were used to calculate flood damages to vehicles at the various levels of flooding.

The saltwater, long duration depth-damage relationships developed for the Morganza to the Gulf, Louisiana (MTOG) evaluation were used to estimate hurricane storm surge damages for the Southwest Coastal, Louisiana (SWCLA) study area evaluation. The eastern edge of the SWCLA study area is located approximately 100 miles west of the western edge of the MTOG study area. Both study areas are characterized by low, flat terrain and are highly susceptible to flooding from the tidal surges associated with hurricanes and tropical storms due to their proximity to the Gulf of Mexico. The apparent subsidence that is taking place along the coast of Louisiana and an increase in relative sea level rise are expected to increase the potential for coastal flooding in the future.

The two study areas also have similar land usage, socioeconomic characteristics, and structure types. Since less than 10 percent of the total acres in the each of the areas is currently developed, there is land available for future development. The land is primarily used for oil and gas activities, recreation, and agriculture. The larger population centers (Lake Charles in SWCLA and Houma in MTOG) are located in the northern portions of the study area. Both areas contain wood frame with pier foundation and masonry with slab foundation residential structures, and similar types of retail, eating and recreation, and warehouse non-residential structures. The average depreciated value of an inventoried residential structure using the Marshal and Swift Residential Cost Estimator Program in 2012 prices for the MTOG is slightly less than a $120,000, while the average value is approximately $116,000 for the SWCLA study area.

Since the source of flooding in both study areas is hurricane storm surges from the Gulf of Mexico, saltwater depth-damage relationships were used in the analysis. When the water is pushed into the area during a tropical event, it must flow over land features such as marshes, agricultural land, roads and highways, ridges along waterways, localized flood risk management systems, etc. After the storm system moves through the area, there are no mechanisms to push the water back over these land features, and the saltwater will remain inside of inundated structures for several days. Evacuated residents will not be able to return to their homes until the roads are safely passable and electrical power has been restored. According to a panel of experts, when water remains inside of structures located in a warm, humid climate for several days, mold will quickly develop and additional damage will occur. Thus, long duration depth-damage relationships were used in the analysis.

Table 5
Southwest Coastal, LA Feasibility Study
Per Capita Income ($)

Parish	1990	2000	2005	2010	2013
Calcasieu	15,478	23,025	28,304	34,346	38,668
Cameron	12,880	18,941	20,678	34,540	39,069
Vermilion	12,423	19,342	23,397	30,273	34,030

Source: Bureau of Economic Analysis

Table 6
Southwest Coastal, LA Feasibility Study
Total Employment
(1,000s)

Parish	1970	1980	1990	2000	2010	2020	2080
Calcasieu	54.2	80.8	82.2	102.8	106.9	126.3	210.4
Cameron	3.4	5.6	5.5	5.7	4.1	5.0	5.4
Vermilion	14.4	19.3	17.7	20.3	20.9	22.7	31.1
Total	72.0	105.7	105.4	128.8	131.9	154.0	246.9

Source: Bureau of Economic Analysis for years 1980-2010 and projections extrapolated from historical data.

Additional U.S. Govt. Resources on Army Corps

- Congressional Budget Office
- Congressional Research Service
- Defense Dept. Inspector General
- Government Accountability Office
- Library of Congress
- National Academies Science, Engineering, & Medicine
- National Archives Record Group (RG) 77
- Smithsonian Institution

- FY 2023 Biden Admin. budget request $6.6 billion for civil works-$8.3 billion for FY 2022 budget.
  Military construction FY 2023 request $7.666 billion-estimated $8.149 billion for FY 2022 budget.
- 35,000 employees-98% civilian as of Dec. 2021. Top five sectors:. Operation & Maintenance 10,297; Engineering 5,748; Administration 4,000; Construction 3,250; Programs & Project Management 2,703; Source: Dec. 2021 GAO Report *Army Corps of Engineers: Workforce Planning…* p. 6.

Benefits of Army Corps Resources

- Learning about history of this agency's activities.
- Gaining enhanced understanding of their continuing importance in civil works engineering and military engineering.
- Learning about reservoirs and recreational facilities the Corps built and maintains near our homes.
- Learning about historical, contemporary, and emerging controversies of Corps activities.
- Gaining enhanced awareness of multiple stakeholders trying to influence Corps activities.
- Becoming aware of Corps constructed and maintained facilities near our homes.
- Understanding multifaceted environmental impacts of Corps works.
- Learn how Corps has operated in civilian and military operational environments.
- Explore future military contingency operations Corps might participate in e.g. South China Sea, Taiwan, East China Sea, Yellow Sea, Russia/Ukraine, Iran, elsewhere?
- Learn how Corps is addressing climate related factors in its activities.
- Gaining enhanced understanding of how domestic waterborne transportation influences the U.S. economic supply chain.

Questions?