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United States Coast Guard

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16500
12 May 2021

MEMORANDUM

[redacted]

From: CG-NAV-3

Reply to CG-NAV-3
Attn o [redacted]

To: CG-NAV

Subj: WATERWAYS ANALYSIS AND MANAGEMENT SYSTEM (WAMS) STUDY FOR THE WESTERN RIVER SYSTEM

Ref: (a) Aids to Navigation Manual – Administration, COMDTINST M16500.7

1. PURPOSE. The purpose of this WAMS is to determine navigational requirements for the Western River System (WRS), which is contained within the 8th and 9th Coast Guard Districts. The outcome of this WAMS will not determine what aids to add, keep, or remove, but rather shape policy for the next generation WRS waterway system management and design. The finding and recommendations included in this study are not intended to be the sole source of information for future ATON policy changes. Due care should be exercised to ensure that the recommendations of this study are carefully considered in totality with other pertinent sources.

2. APPROACH. The WRS was evaluated based on vessel traffic analysis using data collected by the Nationwide Automatic Identification System (NAIS) and was augmented with a user survey designed to evaluate user requirements as expressed by the responses. Additional information was collected during a CCGD8 Fixed and Floating ATON assessment. (enclosure 1). For the purposes of this report, the WRS was split between the Mississippi River System and Apalachicola-Chattahoochee-Flint (ACF) River System in areas where significant differences between the two were observed.

3. INTERNATIONAL AND DOMESTIC STANDARD CONSIDERATIONS. Although the WRS is internal to the United States, many International Standards are used to define navigation and communications equipment capabilities, such as the Inland Electronic Navigational Chart (IENC). The U.S. Army Corps of Engineers (USACE) produces IENCs for the entire WRS which adhere to the standards developed by the Inland ENC Harmonization Group (IEHG).

4. WRS WATERWAY DESCRIPTIONS.

   A. Mississippi River System (Tributaries & Distributaries)
   The WRS is a network of rivers and connecting waterways. From the perspective of natural geography and hydrology, the system consists of the Mississippi River and its

numerous natural tributaries and distributaries. The major tributaries are the Arkansas, Illinois, Missouri, Ohio and Red rivers. Given their flow volumes, major Ohio River tributaries like the Allegheny, Tennessee, and Wabash rivers are considered important tributaries to the Mississippi system. Before the Mississippi River reaches the Gulf of Mexico, it runs into its distributary, the Atchafalaya River. From the perspective of modern commercial navigation, the system includes the above as well as navigable inland waterways which are connected by artificial means. Important connecting waterways include the Illinois Waterway, the Tennessee-Tombigbee Waterway, and the Gulf Intracoastal Waterway. This system of waterways is maintained by USACE with a project depth of between 9 and 12 feet to accommodate barge transportation. The WRS in subdivided into two categories; Pooled and Open Water (aka Fast Water). Pooled water is defined as those waters above a Lock and Dam and the water levels are managed through controlled water release mechanisms and spillways. Open water are those portions of the WRS below Lock and Dam management. Water level variations in open water can be extreme.

Figure 1: Illustration of the Western River System (courtesy of American Rivers Association)

B. Apalachicola-Chattahoochee-Flint River System

The Apalachicola-Chattahoochee-Flint River Basin originates in northeast Georgia, crosses the Georgia-Alabama border into central Alabama, and follows the state line south until it terminates in Apalachicola Bay, Florida. The basin covers 60 counties in Georgia, 10 counties in Alabama, and 8 counties in Florida. The ACF River System is linked to the inland navigation systems through the Gulf Intracoastal Waterway. The Apalachicola, Chattahoochee, and Flint River System consists of a channel 9-feet deep and 100-feet wide from the mouth of the Apalachicola River to the head of navigation at Columbus, GA, for the Chattahoochee River and at Bainbridge, GA, for the Flint River. The total waterway distance is 290 miles with a lift of 190 feet accomplished by 3 locks and dams. The system also provides hydro-electric power, water supply, water quality, flood control, and recreational opportunities.

Figure 2: Apalachicola-Chattahoochee-Flint River System

The USACE Water Management Section of the Mobile District operates five federal reservoir projects: Buford Dam (Lake Lanier), West Point Dam, Walter F. George Lock and Dam, George W. Andrews Lock and Dam, and Jim Woodruff Lock and Dam (Lake Seminole) as components of the ACF system. These are multi-purpose projects for which operations have been congressionally authorized either through the original project authorizations, or by subsequent congressional authorizations that apply generally to all USACE reservoir projects. The reservoir projects are operated in a balanced manner within the system to support all authorized project purposes and benefits within the ACF system to the extent practicable.

USACE does not prioritize the project purposes but does use action zones that have been defined for each of the major storage reservoirs in the ACF system—Lake Lanier, West Point Lake, and Walter F. George Lake. These action zones, which are outlined in the 1989 Draft Master Water Control Plan, are used to determine minimum hydropower generation and maximum navigation releases from conservation storage in the lakes while balancing the lake levels in a system-wide approach.

5. VESSEL DESCRIPTION'S.

Commercial vessels operating on the WRS are referred to as "Towboats." Towboat engine output ranges from less than 600 up to 11,100 horsepower. Most towboats are from 35 to 200 feet long, and 21 to 56 feet wide. Smaller towboats are used in harbors, fleeting areas and around locks while larger towboats operate in "line-haul" operations over long distances and between major ports. On the Mississippi River, below the Chain of Rocks Lock (St. Louis), the river is open with no impediments other than channel size and depth. Larger boats can run this segment of river with a typical tow size of 42 barges, each about 200 feet long and 35 feet wide, configured in a rectangular shape. The whole tow, excluding the towboat, can easily be over 1,200 feet long, 200 feet wide, and hold thousands of tons of cargo. On other parts of the WRS, such as those above St. Louis on the Upper Mississippi River and other rivers such as the Illinois, Ohio, Arkansas, Tennessee and Cumberland, tow size is typically limited to 16 barges due to the size of lock chambers. Towboats that operate in these pooled waters tend to be limited to 5,000 horsepower.

6. WRS DESIGN VESSEL AND CARRIAGE REQUIREMENTS.

Title 33 CFR specifically defines towing vessels operating within the WRS and their navigation equipment carriage requirements. For the purposes of this study the "Design Vessel" for the WRS-Mississippi is a towing vessel >26ft operating solely on the WRS. In accordance with 33 CFR 164, the navigation requirements for a vessel with these characteristics are:

Marine Radar	AIS	Magnetic Compass or Swing Meter
VHF-FM Radio	Charts	Searchlight

7. WESTERN RIVERS MARKING SYSTEM (33CFR §62.51).

A variation of the standard U.S. aids to navigation system is employed on the Mississippi River and tributaries above Baton Rouge, LA and on certain other rivers which flow toward the Gulf of Mexico. The Western Rivers System marking system has the following characteristics:

- Buoys are not numbered.
- Numbers on beacons do not have odd/even lateral significance but, rather, indicate mileage from a fixed point (normally the river mouth).
- Diamond-shaped non-lateral dayboards, checkered red-and-white or green-and-white, similar to those used in the U.S. Aids to Navigation System, are used as crossing dayboards where the river channel crosses from one bank to the other as appropriate.
- Lights on green buoys and on beacons with green daymarks show a single flash which may be green or white.
- Lights on red buoys and on beacons with red daymarks show a double flash [Group Flashing (2)] which may be red or white.
- Isolated danger marks are not used.
- AIS-ATON are used and follow the physical ATON characteristics.

8. WRS NAVIGATION (Mississippi River System).

A. Discussion: Navigation on the WRS-Mississippi System had evolved slowly for over 150 years until the 1993 The Big Bayou Canot rail accident. Early morning September 22, an Amtrak train derailed on the CSX Transportation Big Bayou Canot Bridge near Mobile, Alabama. The derailment was caused by the displacement of a span and deformation of the rails when a tow of loaded barges collided with the rail bridge eight minutes earlier. 47 people were killed and 103 more were injured.

Immediately prior to the rail accident, the towboat Mauvilla made a wrong turn on the Mobile River and entered the Big Bayou Canot, an un-navigable channel of water crossed by a CSX Transportation rail bridge. The towboat's pilot was not properly trained on how to read his radar and so, due to very poor visibility in heavy fog and his lack of experience, did not realize he was off course. The boat also lacked a compass and a chart of the waters. The Pilot believed that he was still on the Mobile River and had identified the bridge in the radar as another tug boat. After the investigation, the Pilot was not found to be criminally liable for the accident.

As a result of its accident investigation, on September 19, 1994 the National Transportation Safety Board (NTSB) made a comprehensive series of recommendations to the U.S. Department of Transportation, U.S. Army Corps of Engineers, U.S. Coast Guard, Federal Emergency Management Agency, Amtrak, and the American Waterways Operators (AWO). Included in the NTSB recommendations were several recommendations to USACE and USCG regarding navigation safety.

Specifically, M-94-30 stated: *"Recent advances in computer technology have made possible the development of digitized electronic charts that can be presented a video screen. The National Oceanographic and Atmospheric Administration (NOAA) is digitally scanning all of its charts, which number about 1000 and expects to complete the project by the end of 1995.*

Digital chart technology, coupled with GPS navigation technology, has made possible continuous electronic representation of navigational positions on computer. Mariners have long plotted their positions based on where they were rather than where they are. Electronic charting will give them continuous, real-time data, allowing them to monitor their positions by looking at the screen. The Safety Board welcomes these advances in technology, which should significantly improve navigation safety. If an electronic charting system and the GPS had been available and installed on inland towing vessels such as the Mauvilla, the accident at the Big Bayou Canot railroad bridge could have been avoided. The Safety Board believes that the Coast Guard and the USACE should promote the development and application of low-cost electronic charting navigation devices for inland rivers.

Therefore, the National Transportation Safety Board recommends the U. S. Army Corps of Engineers: Promote in cooperation with the U.S. Coast Guard, the development and application of low-cost electronic charting navigation devices for inland rivers."

USACE refers to this recommendation as the "birth of their Inland Electronic Navigational Chart (IENC) program." Today, USACE maintains a suite of over 700 (1:5000) IENCs covering 7,260 miles of the WRS.

In 2004, the U.S. Congress enacted section 410 of the Coast Guard and Maritime Transportation Act of 2004 (the Act),[1] which required certain vessels to use electronic charts. The Act also mandated that the Secretary of the department in which the Coast Guard is operating to issue regulations before January 1, 2007, including requirements for the operation and maintenance of electronic charts. In 2018, this requirement was recodified into 46 U.S.C. 3105, and revised in 2021.[2] The requirement that regulations must be promulgated by a certain date (previously the deadline date was January 1, 2007) was removed. The recodification also clarified that regulations issued by the Coast Guard should not apply to certain foreign vessels.

[1] Pub. L. 108-293 (2004).

[2] Pub. L. No. 108-293 (2004), codified at 33 U.S.C. § 1223a; revised and re-codified at 46 U.S.C. § 3105 (Pub. L. No. 115-282, Section 402(a)(1) (2018)). 46 U.S.C. § 3105 was recently amended by section 8301 of the "William M. (MAC) Thornberry National Defense Authorization Act for Fiscal Year 2021" (Pub. L. No. 116-283).

Section 3105 of Title 46 U.S.C. states: ELECTRONIC CHARTS; EQUIVALENCY

a) System requirements.

1) Electronic charts in lieu of marine charts, charts, and maps.--Subject to paragraph (2), the following vessels, while operating on the navigable waters of the United States, equipped with and operating electronic navigational charts that are produced by a government hydrographic office or conform to a standard acceptable to the Secretary, shall be deemed in compliance with any requirement under title 33 or title 46, Code of Federal Regulations, to have a chart, marine chart, or map on board such vessel:

A) A self-propelled commercial vessel of at least 65 feet overall length.

B) A vessel carrying more than a number of passengers for hire determined by the Secretary.

C) A towing vessel of more than 26 feet in overall length and 600 horsepower.

D) Any other vessel for which the Secretary decides that electronic charts are necessary for the safe navigation of the vessel.

2) Exemptions and Waivers. The Secretary may—

A) Exempt a vessel from paragraph (1), if the Secretary finds that electronic charts are not necessary for the safe navigation of the vessel on the waters on which the vessel operates;

B) Waive the application of paragraph (1) with respect to operation of vessels on navigable waters of the United States specified by the Secretary, if the Secretary finds that electronic charts are not needed for safe navigation on those waters; and

C) permit vessels described in subparagraphs (A) through (D) of paragraph (1) that operate solely landward of the baseline from which the territorial sea of the United States is measured to utilize software-based, platform-independent electronic chart systems that the Secretary determines are capable of displaying electronic navigational charts with necessary scale and detail to ensure safe navigation for the intended voyage.

b) Limitation on application.

Except pursuant to an international treaty, convention, or agreement, to which the United States is a party, this section shall not apply to any foreign vessel that is not destined for, or departing from, a port or place subject to the jurisdiction of the United States and that is in—

1) Innocent passage through the territorial sea of the United States; or

2) Transit through the navigable waters of the United States that form a part of an international strait.

B. Although the USCG has not implemented regulations requiring Electronic Charting System (ECS) carriage, it appears that over 95% of the Domestic fleet operating on the WRS carries an GPS/ECS aboard (see Part 7 – Information Collection). On February 3, 2016, the Coast Guard issued guidance in Navigation and Vessel Inspection Circular (NVIC) 01-16, "Use of Electronic Charts and Publications in Lieu of Paper Charts, Maps and Publications" to address the use of electronic charts domestically.[3] NVIC 01-16

[3] This document is available at: https://www.dco.uscg.mil/Portals/9/DCO%20Documents/5p/5ps/NVIC/2016/NVIC_01-16_electronic_charts_and_publications.pdf

established an equivalency to the chart and publication carriage requirements in titles 33 and 46 of the CFR by permitting the use of ENCs in lieu of paper charts under certain circumstances. This NVIC 01-16 was subsequently updated in 2017,[4] 2019,[5] and 2020[6] to reflect changes in available technology and use of electronic publications.

C. Advances in technology such as Global Navigation Satellite Systems (including the GPS), Electronic Chart Systems (ECS), and associated governmental support services such as routinely updated IENCs have improved navigation safety on the WRS as predicted by the NTSB. Today, WRS navigation is a combination of a visual based method utilizing buoys to understand the environmental conditions such as currents plus the location of shifting shoals and digital navigation through use of an ECS & Radar.

9. WRS NAVIGATION SERVICES (Mississippi River System)

A. The USACE Geospatial Center is responsible for U.S. Inland Electronic Navigational Chart (IENC) production and maintenance and program management is based in Louisville, KY. The Inland ENC Harmonization Group (IEHG) was formed in 2003 by the U.S. and several Europe Nations to facilitate the development of international standards for Inland ENC data. The USACE IENC Program Manager is currently Co-Chair of the IEHG and CG-NAV is a member of the U.S. Delegation. USACE maintains a suite of over 700 (1:5000) IENCs covering 7,260 miles of the WRS and these charts are considered the international "gold standard."

B. Vessel Traffic Service (VTS) Louisville was originally created in 1973, in response to an incident involving a chlorine barge which lodged in the hydro power plant gates of McAlpine dam, requiring the evacuation of the Portland area of Louisville. During a period of high water and strong current flow, a down bound tow unexpectedly found the L&I Railroad Bridge at the entrance to Portland Canal in the closed position. This forced the towing vessel to back down to avoid collision with the drawbridge resulting in the breakup of the tow, creating a critical situation. The VTS, in addition to the regional Waterways Action Plan (WAP), is designed to prevent these situations by providing communications assistance and guidance during periods of high water. VTS Louisville is activated whenever the McAlpine upper gauge reaches 13.0 feet or higher, and is announced by Broadcast Notice to Mariners. Only one tow or vessel at a time is permitted between Towhead Island and the L&I Railroad Bridge.

[4] "Equivalency Determination for "Marine Charts," "Charts," or "Maps," "Publications," and Navigation Functions-Notice of Availability of Navigation and Vessel Inspection Circular 01-16 Change 1," issued on July 18, 2017. This document is available at: *https://www.regulations.gov/document?D=USCG-2017-0692-0001*.
[5] "Notice of Availability of Navigation and Vessel Inspection Circular 01-16 Change 2-Use of Electronic Charts and Publications in Lieu of Paper Charts, Maps and Publications," issued on September 20, 2019. This document is available at: *https://www.regulations.gov/document?D=USCG-2019-0346-0003*.
[6] "Navigation and Vessel Inspection Circular 01–16 Change 2—Use of Electronic Charts and Publications in Lieu of Paper Charts, Maps and Publications" issued on May 27, 2020. This document is available at: *https://www.regulations.gov/document?D=USCG-2019-0346-0010*.

C. The Nationwide AIS system (NAIS) is a network of 134 AIS Base Stations established primarily along the Coastal U.S. and is supplemented by data received from Base Stations established to support VTS systems/operations. The NAIS is not truly nationwide, NAIS transceivers are limited in reception and transmission coverage to 58 critical ports and waterways - resulting in significant gaps throughout the country. One major coverage area gap is the WRS. and Alaska. This area is supplemented with AIS coverage provided by USACE. The current state of USCG NAIS transmit capability is confined to transmission through direct configuration of AIS Base Station(s) in order to transmit AIS-Aids to Navigation (AIS-ATON) messages. This is accomplished by sending transmitter configuration messages from USAIMS to the individual transmitter(s). All other transmissions of Marine Safety Information (MSI) type messages including Environmental and Geographic Notice are not supported through the USCG AIS Base Station configuration method. USAIMS does not currently have access to VTS Base Stations to configure AIS-ATONs. Therefore, the VTS Base Stations in Louisville, KY are not AIS-ATON capable.

D. The USACE Lock Operations Management Application (LOMA) uses AIS-ATON to support lock operations and facilitate efficient traffic flow through the pooled waters (river segments whose water level and currents are controlled through the use of locks). The LOMA AIS-ATON stations used by USACE have transmit capability and are currently broadcasting Virtual & Synthetic AIS-ATON message as well as other MSI messages including Environmental and Geographic Notices. In recent years there has been a significant increase to the numbers of Virtual AIS-ATONs being transmitted by USACE to mark areas with shoaling. USCG Sectors will often request USACE Districts to establish Virtual AIS-ATONs and broadcast Geographic Notices. Additionally, USACE is developing remotely operated Physical AIS-ATON units and deploying them in locations as needed throughout the WRS. The remote AIS-ATON are networked using cellular technology and have extremely small power requirements. CG-NAV is researching use cases for self-contained Physical AIS-ATONs, but to date, these units do not have the remotely operated capability.

E. Waterway Action Plans (WAP) have been established throughout the WRS. The WAPs are developed in partnership with USACE, State and local governments, and industry leaders through local River Industry Action Committees (RIAC). RIAC's are an association of companies and organizations who are stakeholders in the commercial industry on the inland rivers. As the name suggests, they act in an advisory capacity on a wide range of issues affecting the activities of the industry on the rivers and they provide an industry perspective to the Coast Guard and USACE on matters such as high and low water, ice conditions, shoaling, marine accidents, etc. WAPs are intended to facilitate the safe and orderly movement of traffic during extreme conditions. The WAPs are considered living documents and are frequently updated. The WAPs describe what ATON operations will occur as well as vessels traffic restrictions such as minimum horsepower and one way transits areas

10. WRS NAVIGATION SERVICES (ACF River System).

A. Discussion: Navigation on the WRS-ACF System relies primarily on local knowledge has become almost exclusively recreational. While the entire system has a 9ft project depth, the USACE has been unable to maintain that level on the Apalachicola River for many years. The USACE ACF Master Water Level Control Manual provides a strategy to maintain water levels within the entire system for navigation and other project purposes. Currently all three lock and dam systems in the ACF are closed to vessel traffic (Walter F. George Lock and Dam, George W. Andrews Lock and Dam, and Jim Woodruff Lock and Dam). The ACF now essentially consists of two lakes and 1 river accessible from sea (Apalachicola River).

B. Charts of the ACF System: There are no Official Paper or Electronic Charts which meet carriage requirements for commercial vessels operating on the ACF. There are commercially produced paper/electronic charts and the USACE has provided “Lake Maps” for recreational use. A review of commercially available Electronic Charts was made during this study and found that these charts while impressive in appearance, did not include any source information related to features such as depths and aids to navigation. Note: USACE provides on request, IENCs for ANT Eufaula based on surveys conducted by the Mobile District. These IENCs are special purpose and do not contain all of the information normally found in an official IENC.

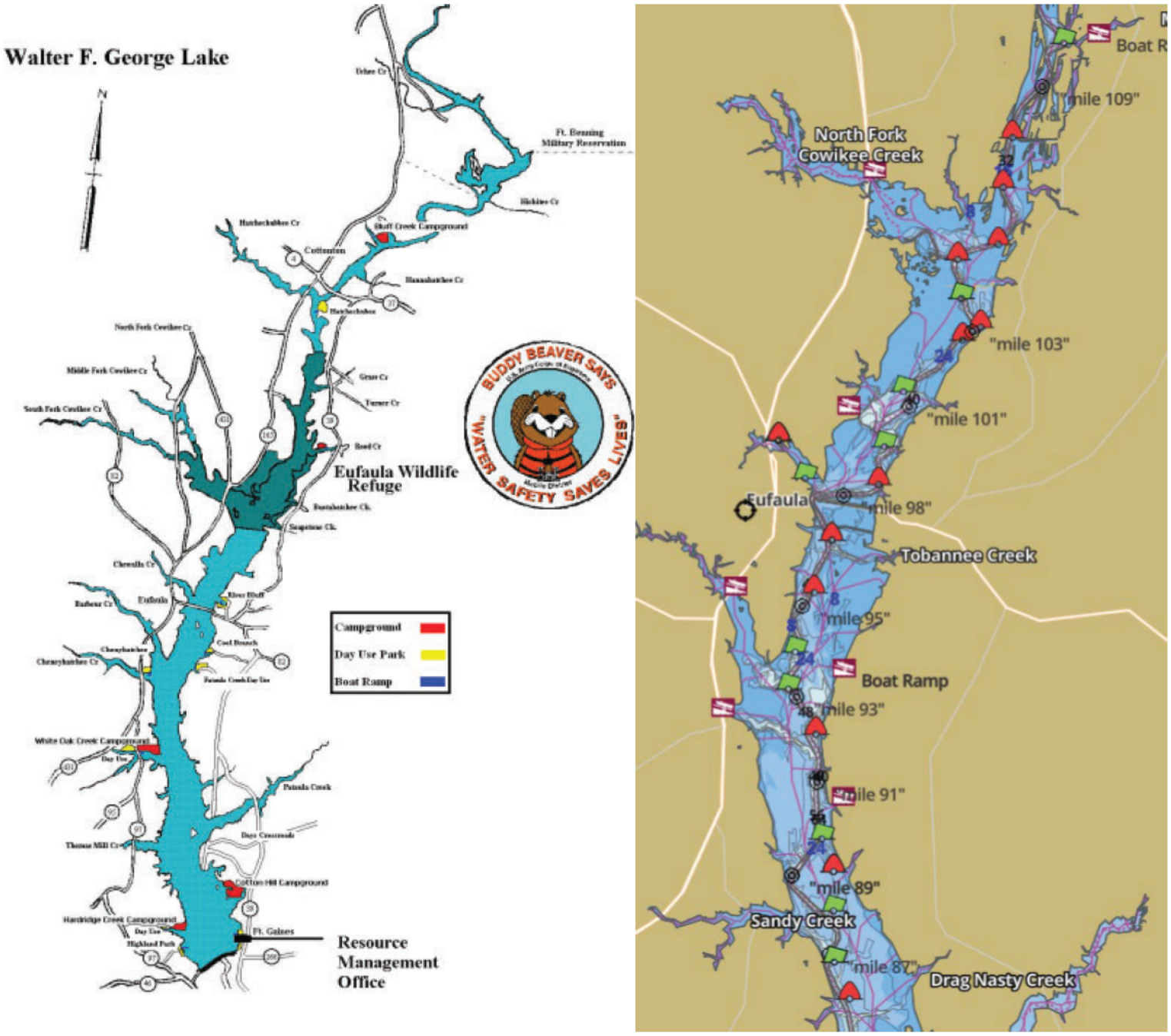

Figure 3: Sample of Sample of Walter F. George Lake Map and Unofficial Electronic Charts available online

(See: GPS Nautical Charts.com as an example of commericaly availble products)

11. WRS ATON OPERATIONS (Mississippi River System)

A. There are 20 ATON Servicing units (18 River Tenders and 2 Aids to Navigation Teams (ANT)) charged with ATON management responsibilities on the WRS. A table of ATON servicing units and their AOR can be found in Enclosure 3. Buoys are routinely repositioned based on current and predicted environmental conditions. The buoy constellation vacillates in numbers based on water level - measured by river gauges, ice, and amounts of debris such as trees. The location of the buoys prior to April 2014 was disseminated to industry partners and their mariners through various means, but in practice, the mariner did not have a complete understanding of the buoy laydown until they transited through an area. This situation led to mariners exchanging information as they encountered each other during transits. Similarly, shoaling information was also passed along through this verbal communication and was relayed to CG ATON unit Officer In Charge (OIC) for their use to establish or realign the "buoy line".

B. ATON servicing units use a number of tools and data sources to establish and operate ATON on the WRS, but ultimately the depth sounder and water level predictions remain the primary toolset. OIC's will develop a buoy line along a segment of a river through observation of depth and predicted water levels at gauges along the entire river system. In pooled waters, buoys will be set at the project depth (typically 9ft) for normal pool elevations. In open waters, buoys will be set so that the minimum project depth (typically 9-12ft) and will be available on the buoy line for the prevailing river stage(s) until the unit returns. Buoys may be set in deeper water when a drop in water level is predicted. Buoys are not normally set in water less than project depth if a rise is predicted. USACE provides routinely updated survey data in areas were river bottom conditions change frequently to assist with development of the buoy line.

C. In 2005, the CG began to field Electronic Charting Systems (ECS) to WRS ATON units and today, the USCG ECS-Inland system is on board all cutters with laptop versions provided to the two Aids to Navigation Teams (Colfax & Eufaula). The CG-ECS-I is a variant of the standard CG-ECS equipment provided to coastal units and is specifically designed to position and capture data for floating aids. In support of the CG-ECS-I deployment, CG-NAV issued an updated WRS ATON Positioning Guidance letter which included policy for positioning both fixed and floating ATON (enclosure 4). Traditionally, the "River Mile" was used to convey ATON and Marine Safety Information (MSI). While this is extremely useful aboard vessels, it does not work well within database structures, digital communications, and geospatial applications. In an effort to adhere to the international standards set by the International Hydrographic Office (IHO) followed by USACE IENCs, the CG began to transition WRS ATON and MSI data from river mile to a position standard.

D. CG-ECS-I is capable of ingesting specially formatted USACE survey data and has greatly enhanced the ability to develop a buoy line and has significantly reduced cutter underway hours previously devoted to "finding the depth curve". Buoy positioning data captured by CG-ECS-I is transferred into the ATONIS database using a synchronization feature within USAIMS. This data is in turn used to create a "weekly buoy file"

containing all necessary information to properly encoded an Inland Electronic Navigation Chart (IENC). The weekly buoy file is reviewed by CG-NAV and transferred to USACE who subsequently issues and official IENC (3UABUOYS) covering the entire WRS. Most ECS manufactures in use by towboats on the WRS have automated the chart update functionality within their systems and as a result, mariners are using buoy information which is at most 7 days old. This internationally "first of kind" ATON information product has been operating since Apr 2014 with over 350 editions published to date.

E. While there is currently no formal CG training for CG-ECS-I use, POIC/PXPO's are afforded an ad hoc opportunity to gain exposure to the system while attending pipeline training at NATON. This training is provided by C5IT ECDIS/ECS support staff. Additionally, C5IT staff must routinely support WRS ATON units through electronic correspondence and site visits.

Waterway design guidelines and procedures have been formally established for coastal waterway managers and are contained in the Aids to Navigation Manual – Administration (CM16500.7 (series)), but there is no specific policy or guideline for the WRS. CCGD8 has developed and promulgated guidance in their D8 Waterways & ATON Management Policy (D8INST M16500.1 (series)) and D8 Tactics, Techniques, and Procedures, D8TTP 20-04A documents (see enclosures 5 & 6). Additionally, information collected during D8's Fixed and Floating ATON assessment. (enclosure 1) is being used by OIC's as "style guide". Establishment, Relocation and Discontinuance of Floating ATON is at the discretion of the OIC. D8(dpw) retains authority to Establish, Relocate and Discontinue Fixed ATON. USCG Light List Volume 5 contains all Fixed ATON and unique among the 7 volume Light list, it also contains information regarding Locks & Dams, Bridges, and other unique features. Floating ATON are currently excluded from the Light List.

12. WRS ATON OPERATIONS (ACF River System)

ATON maintained by ANT Eufaula on the ACF River System are unique to this system due to the lack of an official suite of nautical charts (see paragraph 9.B). Therefore the ATON provided in this system cannot be correlated and/or referenced to a chart as they are in the rest of the U.S. While floating ATON types and positions are captured CG-ECS-I, they are not contained in the weekly buoy file because there is no underlying IENC. Similarly, fixed ATON data has not been historically maintained by D8 or the ANT in IATONIS/USAIMS system. As such, fixed ATON in the ACF is not contained in the Light List and does not have District or HQ programmatic visibility. Note: D8 has begun a project to enroll all ACF fixed ATON into IATONIS/USAIMS. Additionally, as noted in paragraph 9.A., the lock closures have basically divided the system into three segments. As a result, ANT Eufaula relocated their 64ANB below the locks and the boat can only operate in the Apalachicola portion of the system. ANT Eufaula uses their 26TANB for the upper to reaches of the system.

13. INFORMATION COLLECTION.

A. Heat maps and other analytical tools using AIS data were useful in revealing traffic volume and areas within a river that appear to be shoaling as indicated by vessel tracks. AIS data reviewed during the course of this study reaffirmed what we have observed about the system, there are significant volumes of vessel traffic throughout the majority of the WRS. Data analysis also illuminated an imbalance between vessel traffic and ATON level of service in several rivers and waterways.

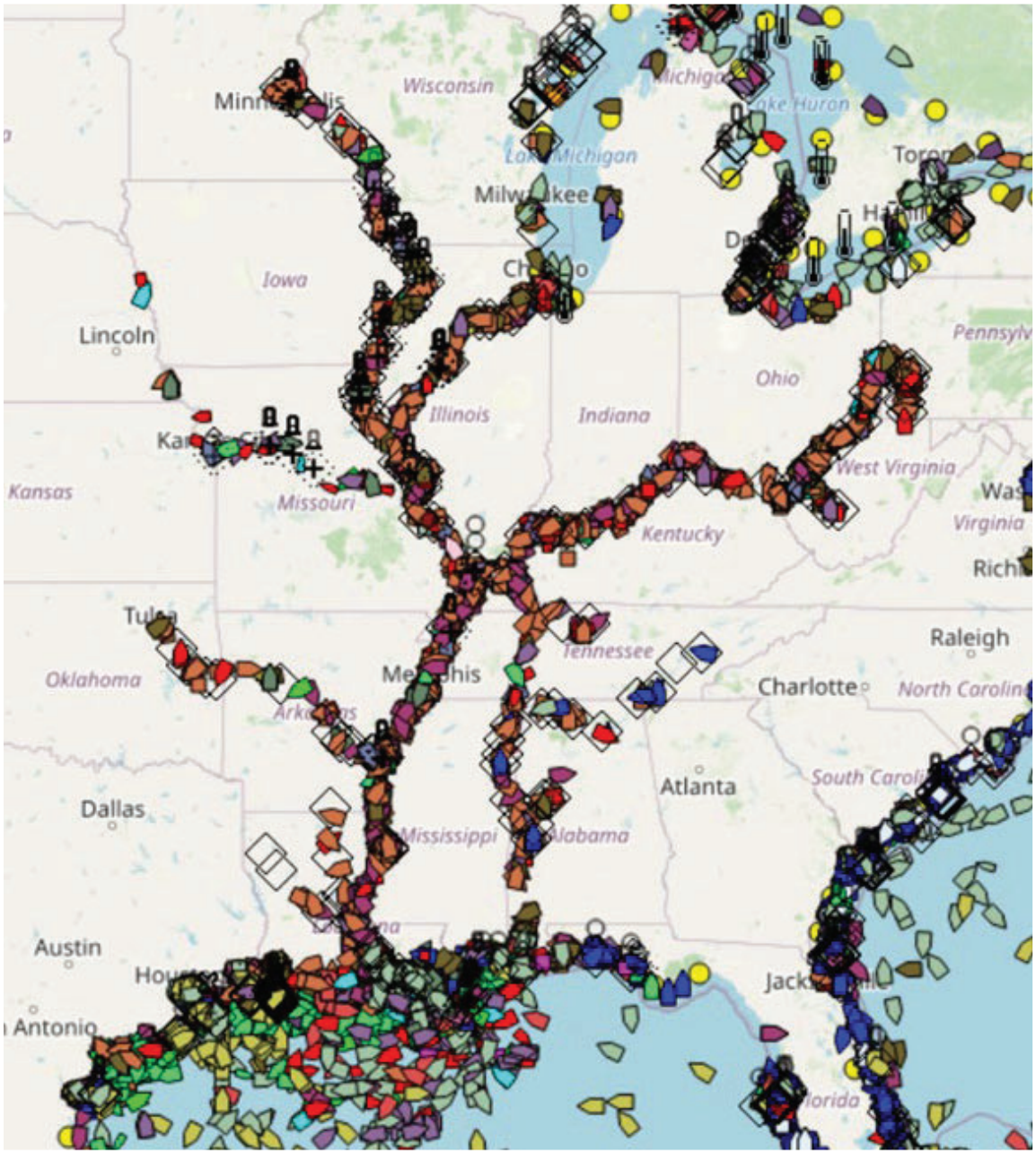

Figure 4: Example a traffic density within the WRS (11 Nov 2020)

The illustration below is an example of a heat map which can assist with waterway management. In this instance AIS data reveals that only 63 vessels transited the Missouri River in the vicinity Jefferson City, MI during the period of 28 Feb 2017 – 30 Mar 2018.

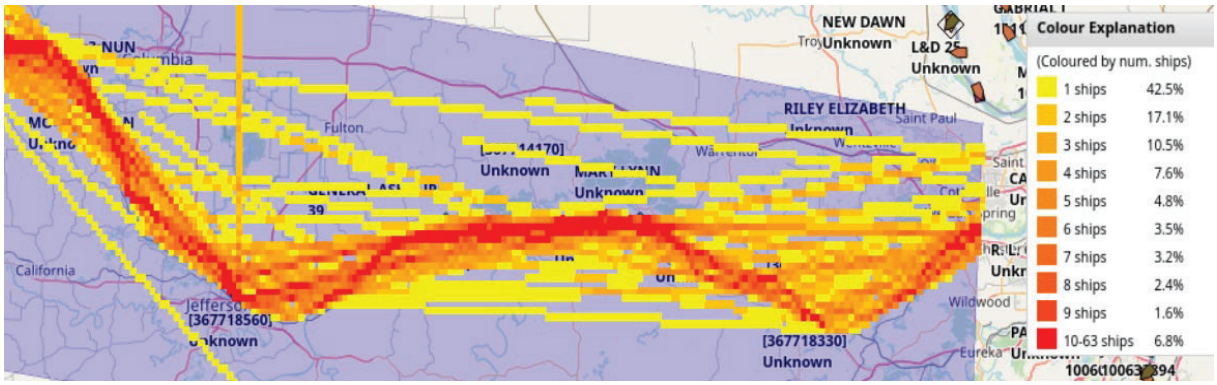

Figure 5: Historical Transit Heatmap: Start time 28 Feb 2017 End time 30 Mar 2018

B. During Feb-Oct, 2018 the U.S. Coast Guard published a User Feedback Form on surveymonkey.com. Links to the User Feedback form were posted on the NAVCEN website, and public comments were solicited through the Local Notice to Mariners. The Survey had 462 respondents. Additionally, CG-NAV, District 8, and WRS Sector Offices conducted public outreach. Survey questions are contained in enclosure (7).

C. The American Waterways Operators (AWO) is a national advocate for the U.S. tugboat, towboat and barge industry. CG-NAV requested the AWO leadership to provide their comments and assessment regarding USCG's ATON service in the WRS. The AWO response is enclosure (8). " The efficient movement of waterborne commerce on the Western Rivers would not be possible without the utilization of physical ATONs to support and enhance safe navigation. AWO has a long history of working with the Coast Guard to determine the appropriate balance between physical and electronic AtoNs on the inland waterways."

D. The CGD8 Fixed and Floating ATON Assessment (2017-2018) was a Mississippi River system wide, base-line assessment of all fixed and floating aids and was conducted in coordination with various regional industry operating committees (including AWO). Coast Guard personnel from District Eight, and the inland Sectors including all 18 inland buoy tender Officers-in-Charge (OICs) met with tow boat operators and industry representatives throughout the WRS in the following locations: Natchez, MS; Vicksburg, MS; Memphis, TN; St. Louis, MO; Louisville, KY; Paducah, KY, Little Rock, AR and Mobile, AL. Over 4,600 miles of river and over 8,000 buoys were assessed on the Mississippi (Baton Rouge to St. Paul), Ohio, Illinois, Cumberland, Tennessee, and Arkansas Rivers and the Tennessee- Tombigbee Waterway. The various waterways were broken down using the inland buoy tender operating areas as the geographic focus for each assessment. The OIC would display on a screen the most current buoy laydown using CG-ECS-I. The assessment team, including the OIC and licensed professional mariners with recent operational experience on that particular waterway, reviewed every five-mile stretch of river within the cutter operating area. The team discussed and

documented the optimal buoy laydown for that stretch of waterway (including high and low water sets for non-pooled areas) and determined whether AIS-ATON (i.e. virtual/synthetic AIS-ATON) could replace or augment physical buoys/floating AtoN. In addition, and most importantly, the assessment team "captured corporate knowledge". For example, if a particular bend in the river required a particular buoy set/laydown to support safe navigation, not only was the number of buoys, their location and spacing annotated in the spreadsheet but also the "why" this particular set was needed in this particular location. This captured corporate knowledge will inform and educate future Coast Guard personnel increasing their awareness of industry's needs and ultimately enhance service delivery to best drive down risk. The final report of the Fixed and Floating ATON Assessment is in enclosure (1). Note: This study did not include the ACF River System.

E. The Western Rivers Joint Capability Technical Demonstration (JCTD) was conducted by the USCG Research & Development Center from 2015-2017. The intended purpose of the technical demonstration was to provide an AIS transmit proof of concept and determine future infrastructure requirements to fully support NAIS transmit capabilities. The report outlines the framework (the way forward) and system architecture necessary to enhance USCG mission execution using AIS technology. Such a system would support all Prevention and Response missions by enabling the efficient distribution of a variety of Marine Safety Information (MSI) in electronic form (eMSI) to both the maritime public and USCG assets. The final report is contained in enclosure (9).

F. In 2017, CDR J. Kimura (CG-NAV-3) and Mr. R.D. Lewald conducted CGD8, WRS Sector/unit visits in New Orleans, Mobile, Memphis, Louisville and St. Louis to conduct interviews in support of the WRS WAMS.

14. ANALYSIS.

A. **User Surveys**: A voluntary user feedback form (OMB Control Number 1601-0014) was available on surveymonkey.com from February through October 2018 consisting of 28 questions. The questions were designed to determine the navigational requirements of waterway users navigating within the WRS. The summary report of responses is provided in enclosure (10). Of the 462 total responses, 362 (78%) respondents identified their vessel type as a towing vessel, while the remaining respondents identified their vessels as military, passenger vessel, recreational, or other. As indicated in paragraph 5.A, the design vessel for the WRS WAMS is a towboat operating solely on the WRS. While feedback from operators of the other vessel types was deemed valuable, this study is focusing on providing a level of service for the WRS Design Vessel.

B. **ATON Data**: CG-NAV maintains a library of the Weekly Buoy Report generated by the ATONIS database which is used to develop the USACE Buoy Layer IENC. An analysis of these data was conducted for the period of 1 Jan 2018 – 1 March 2020. The Chart below is a count of buoy records by river and illustrates the amount of buoys that we either relocated or left in the same position when serviced.

River Name – **Mississippi River System**	Buoys Records (1/18 – 3/20)	Buoys with identical positions over multiple visits	Percentage of Buoys with identical positions over multiple visits	Open or Pooled Water
Ohio	3019	2555	85%	Pooled Water
Upper Mississippi	17891	16674	93%	Pooled Water
Black Warrior Mulberry Fork	35	0	0%	Open Water
Atchafalaya	88	2	2%	Open Water
Black Warrior Locust Fork	26	2	8%	Open Water
Lower Mississippi	6497	3277	50%	Open Water
Missouri	660	536	81%	Open Water
Elk	10	0	0%	Pooled Water
Little Tennessee	23	0	0%	Pooled Water
Minnesota	2	0	0%	Pooled Water
San Bois Creek	38	0	0%	Pooled Water
Emory	43	1	2%	Pooled Water
Allegheny	71	18	25%	Pooled Water
Pine Bluff	6	2	33%	Pooled Water
Monongahela	259	184	71%	Pooled Water
Tennessee-Tombigbee	677	536	79%	Pooled Water
Red	559	444	79%	Pooled Water
Kaskaskia	42	34	81%	Pooled Water
Clinch	174	143	82%	Pooled Water
Black Warrior	754	638	85%	Pooled Water
Tombigbee	1323	1145	87%	Pooled Water
White	98	88	90%	Pooled Water
Green	144	130	90%	Pooled Water
Cumberland	2042	1851	91%	Pooled Water
Hiwassee	197	180	91%	Pooled Water
Kanawha	311	288	93%	Pooled Water
Tennessee	4016	3790	94%	Pooled Water
Keller Lake	40	38	95%	Pooled Water
Arkansas	4563	4475	98%	Pooled Water
Illinois	9801	9686	99%	Pooled Water

River Name – **ACF River System**	Buoys Records (1/18 – 3/20)	Buoys with identical positions over multiple visits	Percentage of Buoys with identical positions over multiple visits	Open or Pooled Water
Apalachicola	204	6	3%	Open Water
Chattahoochee	221	19	9%	Pooled Water
Flint	76	4	5%	Pooled Water

15. FINDINGS.

A. Below are the significant findings from the data analysis including responses from the survey questions. Additionally, information collected during the study is also considered within this section. Analysis of the survey responses indicates that the majority of operators of the WRS design vessel rely on electronics for navigation and information collection & display.

Q1: What type and size of vessel do you operate in these waters?

ANSWER CHOICES	RESPONSES	
Military	2.60%	12
Towing Vessel >26ft	62.47%	288
Towing Vessel <26ft	16.05%	74
Passenger Vessel	5.64%	26
Power Recreational Vessel	7.16%	33
Sailing Recreational Vessel	0.43%	2
Other (please specify)	5.64%	26
TOTAL		461

What is your Primary means to determine your position?

ANSWER CHOICES	RESPONSES	
Global Navigation Satellite System (GPS)	13.94%	64
Electronic Charting System (ECS) e.g. Rose Point, Nobeltec, CNS, etc	49.02%	225
Radar	13.51%	62
Visual Landmarks	21.79%	100
Other (please specify)	1.74%	8
TOTAL		459

What is your Secondary means to determine your position?

ANSWER CHOICES	RESPONSES	
Global Navigation Satellite System (GPS)	14.35%	66
Electronic Charting System (ECS) e.g. Rose Point, Nobeltec, CNS, etc	25.22%	116
Radar	30.87%	142
Visual Landmarks	26.52%	122
Other (please specify)	3.04%	14
TOTAL		460

What format do you prefer your navigation reference materials to be in?

ANSWER CHOICES	RESPONSES	
Electronic (Downloaded prior to getting u/w)	76.37%	349
Web-Based (Real-Time)	52.08%	238
CD	2.41%	11
Mobile Device (SMS/MMS Text)	21.01%	96
Mobile Device Application	30.85%	141
Paper	47.05%	215
Other (please specify)	4.38%	20
Total Respondents: 457		

While underway, how do you prefer to obtain weather information?

ANSWER CHOICES	RESPONSES	
HF SSB (High-Frequency Single Side Band)	0.22%	1
VHF Marine Band	24.29%	111
Mobile Device Application (i.e. smartphone, tablet)	35.89%	164
Mobile Device Web Browser	8.97%	41
Mobile Device SMS/MMS Text	4.16%	19
Internet (Satellite)	11.82%	54
Internet (Cellular)	11.60%	53
Other (please specify)	3.06%	14
TOTAL		457

How do you obtain river stage information and dam outflow information?

ANSWER CHOICES	RESPONSES	
HF SSB (High-Frequency Single Side Band)	0.66%	3
VHF Marine Band	34.65%	158
Mobile Device Application (i.e. smartphone, tablet)	39.91%	182
Mobile Device Web Browser	34.43%	157
Mobile Device SMS/MMS Text	5.92%	27
Internet (Satellite)	33.11%	151
Internet (Cellular)	46.71%	213
Other (please specify)	11.84%	54
Total Respondents: 456		

Have you observed any electronic Aids to Navigation such as AIS-ATON?

ANSWER CHOICES	RESPONSES	
Yes	58.52%	261
No	41.48%	185
TOTAL		446

What do you consider to be a narrow channel?

ANSWER CHOICES	RESPONSES	
Less than 100 ft	17.84%	81
100-200ft	25.11%	114
200-300ft	29.30%	133
Greater than 300ft	9.25%	42
Other (please specify)	18.50%	84
TOTAL		454

B. **WRS-Mississippi River System Fixed and Floating ATON**: During the D8 Fixed and Floating ATON assessment, it was determined that many fixed ATON no longer served a necessary function and could be discontinued. However, it was noted that in several instances the ATON is used as a reference point and often used to describe meeting points between vessels. Several Fixed ATONs recently discontinued have been converted to reference points and charted as such on USACE IENCs. Additionally, most industry representatives and vessel operators interviewed during this study indicated that Mile Boards are no longer required or used as a reference point. The IENCs display river miles and have rendered the Mile Board on Fixed ATON obsolete. Note: The findings of this study did not include the ACF River System.

Analysis of the 2+ years of weekly collected buoy data indicates that the positions and numbers of buoys in pooled water are stable and seldom changed. Furthermore, during unit interviews, it was discovered that OIC's were retaining buoys in the database even though they were not physically in the waterway. This practice is routine on the Upper Mississippi and Illinois Rivers and was solidified during the D8 ATON Assessment wherein the term "Virtual Buoy" was coined. The Illinois River has 951 buoys in the database and each winter a significant portion of the buoys are lost due to ice. The CGC SANGAMON is the only WLR servicing this waterway and their routine is to replace lost buoys beginning in the Spring and eventually completing the restoration by early Summer. During our interview, the OIC equated this practice with buoys charted in coastal waters "we don't take missing buoys off those charts, why should we take them off river charts". Note: The term "Virtual Buoy" while used in conversation, is not recognized internationally by ATON authorities.

C. **WRS-ACF River System Fixed and Floating ATON:** Analysis of the 2+ years of weekly collected buoy data from ANT Eufaula was inconclusive due to on board system failures (laptop casualties) and improper use of buoy positioning equipment due to lack of system training. Additionally, data accuracy verification is impossible due to the lack of an official chart of the system on which to perform a verification.

D. Interviews with OIC, XPO and Operation Petty Officers conducted during this study have revealed that tools contained within CG-ECS-I designed to assist with ATON positioning are inconsistently used between units and in cases between members assigned to the same unit.

16. CONCLUSIONS.

A. The requirements for a physical constellation of ATON in the WRS-Mississippi was validated by user feedback. While a high number of respondents indicated their reliance on electronic charting (ECS), reliance on ECS does not diminish the need for physical ATON to provide visual indications of currents, shoals, etc.

B. The requirements for a physical constellation of ATON in the WRS-ACF was not validated by user feedback as there were only 10 respondents. Furthermore, it cannot be assumed that the 10 respondents answers mirrored others because they questions were

predominantly associated with use of official charts (ex. What is your Primary and Secondary means to determine your position?).

C. Failure to adhere to policy has given rise to a now accepted practice in Sector Upper Mississippi. The use of the "Virtual Buoy" concept has become routine and expected by industry and mariners alike. D8 has promised industry representatives who participate in regional advisory groups that virtual buoys will be included in WRS waterway designs (see enclosure 1). A "virtual buoy" as defined and used by Sector Upper Mississippi does not meet the definition of an Aid to Navigation and is actually akin to a Navigation Aid. While the terms seem similar, their functions are not:

Aid to Navigation – a device, system or service, external to vessels, designed and operated to enhance safe and efficient navigation.

Navigation Aid – an instrument, device or nautical publication carried on board a vessel for the purpose of assisting navigation.

D. The ability to save and store waterway designs for floating ATON for a given water level is a capability within the CG-ECS-I system. "Templates" for high & low water buoy positions can be developed and reviewed with industry partners and be enacted during those occasions. The D8 ATON assessment report alluded to the template concept, but does not make the connection with the CG-ECS-I capability. Additionally, during OIC interviews, it was apparent that many OICs were unaware of this capability. The template capability was one of many user requirements identified by OICs during interviews for development of CG-ECS-I Functional Requirements.

E. Training deficiencies and lack of program oversite have contributed to inconsistencies with the delivery of ATON services in the entire WRS. Many mariners interviewed for this study remarked that there is a notable difference in ATON as they transit through various WLR AORs. Additionally, there are inconsistencies between USCG Sectors and USACE Districts regarding the dissemination of Marine Safety Information (MSI). Currently MSI is disseminated through various methods such as USCG Broadcast/Local Notice to Mariners, USACE issues Notice to Navigation Interest, and Homeport.

F. Seventy-two percent (72%) of mariners responded that they consider 300ft and less is a narrow channel for purposes of waterway design, but this dimension should in no way should be construed with rule 9.

17. RECOMMENDATIONS.

A. The Coast Guard should continue to provide traditional fixed and floating ATON and AIS-ATON in the WRS-Mississippi River System. The level of service provided for the WRS should be based on the volume of traffic and degree of risk for the WRS Design Vessel. The System shall be marked in a manner which is justifiable due to the volume of traffic, and the degree of risk in the specific area of the system.

B. The findings of the D8 Fixed and Floating ATON Assessments should be implemented and a Waterway Style Guide should be developed and incorporated into D8 Waterways and ATON Management Policy (D8INST M16500.1 (series)) and D8 Tactics, Techniques, and Procedures, D8TTP 20-04A

C. District 8 Waterway Managers and ATON units should consider channel < 300 ft wide as narrow channel for the purpose of Waterway Design in determining how best to structure and place aids to navigation.

D. The Coast Guard should develop 'Buoy Templates" for various scenarios (high/low water, ice, etc.) and incorporate them into regional WAPs. The templates should be closely adhered to by WLRs and changes should be documented/approved at the Sector level.

E. Based on their routine and expected use by industry and mariners the Coast Guard should adopt the use of Navigation Aids (described as "virtual buoys") and formally incorporate them into WRS ATON System. Functionality to add the following Nav Aids (colored circles vice colored buoy shapes) needs to be added to CG-ECS-I: Port Hand Mark (Green Circle), Starboard Hand Mark (Red Circle), Preferred Channel Starboard Hand (RGR Circle), Preferred Channel Port Hand (GRG Circle), & Special Mark (Yellow Circle). The Coast Guard should develop a corresponding recommendation to the IEHG with definitions and proposed symbology.

F. CG-NAV should annually review CG-ECS-Inland and USAIMS requirements to ensure WRS units are properly supported.

G. The WRS design vessel relies predominately on ECS for navigation. The Coast Guard should implement a carriage requirement and adopt a minimum ECS system standard. The equivalencies provided in USCG NVIC 16-01 CH-2 should be considered as a baseline for future regulations.

H. The Coast Guard should establish a joint USACE-USCG WRS ATON/MSI center of excellence (COE) in Louisville, KY. Louisville is the recommended location because the USACE IENC program already resides in Louisville. The COE would ensure consistency of ATON and MSI across the 4 Sectors operating ATON in the WRS. Additionally, this COE should have a live watch to collect disseminate MSI (BNM & NTNI, etc.) as well as establish emergency AIS-ATON to respond to shoaling and other marine incidents. The COE will assist Sector Commanders with routine & emergent ATON support.

I. The Coast Guard should expand the NAIS network to provide coverage of the WRS and enter into an agreement with USACE to gain access to their AIS-ATON to transmit ATONs and MSI.

J. The Coast Guard should implement recommendations contained in the RDC Western Rivers Joint Capability Technical Demonstration (JCTD) report. The report outlines the framework and system architecture necessary to enhance USCG mission execution using

AIS technology. Such a system would support all Prevention and Response missions by enabling the efficient distribution of a variety of Marine Safety Information (MSI) in electronic form (eMSI) to both the maritime public and USCG assets.

18. FOLLOW-ON ANALYSIS RECOMMENDED

A. The Coast Guard needs to determine if ATON should be provided in areas where Official Charts are not provided; further analysis should specifically include ACF River system.

B. An analysis of the capabilities and staffing of ANT Eufaula should be conducted to determine impacts to mission and crew safety and efficiency. As noted in paragraph 10.G. ANT Eufaula's assets (64ANB & 26TANB) have been spilt by the closure of the lower most lock in the ACF River System.

C. The Coast Guard should conduct a Front End Analysis (FEA) to determine the training needs for WLR/ANT Command Cadre. The analysis should review current "river" schools commercially available (e.g. Seamans Church & Western Kentucky College both in Paducah).

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Enclosures: (1) CCGD8 Fixed and Floating ATON assessment
(2) USCG NVIC 01-16 CH-2
(3) ATON servicing units and their AOR
(4) WRS ATON Positioning Guidance ltr dtd 20 Oct 2015
(5) D8 Waterways and ATON Management Policy (D8INST M16500.1 (series))
(6) D8 Tactics, Techniques, and Procedures, D8TTP 20-04A
(7) Questionnaire
(8) American Waterway Operators ltr dtd 5 Sep 2018
(9) Western Rivers Joint Capability Technical Demonstration (JCTD): Final Report dtd June 2017 (FOUO)
(10) Questionnaire Response Analysis

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16500
30 Jul 2021

MEMORANDUM

From: M. D. Emerson
COMDT (CG-5PW)

Reply to [redacted]
Attn of: [redacted]

To: Distribution

Subj: INTERIM GUIDANCE ON LEVEL OF SERVICE FOR THE UNITED STATES WESTERN RIVERS SYSTEM

Ref: (a) 5PW Memo 16500 of 9 June 2015
(b) W/R WAMS CG-NAV-3 Memo 16500 of 12 May 2021

1. Purpose: The purpose of this document is to provide policy guidance for Aids to Navigation (ATON) Level of Service on the Western River System (WRS).

2. Responsibility: Coast Guard Districts Eight and Nine shall incorporate this guidance into their waterway design, planning, and operations.

3. Background: The WRS is a key component of the overall U.S. Martine Transportation System (MTS) and has multiple unique complexities. While the number and size of the ships traveling through the U.S. Marine Transportation System (MTS) has increased, the number and size of U.S. navigation corridors has not. To address these changes, the USCG conducted a Waterways Analysis and Management System (WAMS) study of the Western Rivers Aids to Navigation (ATON) system (references a and b). As a result of this study, the Level of Service guidance below will provide District Eight and District Nine the ability to adjust the Western Rivers ATONs appropriately to ensure the Coast Guard is meeting modern navigational requirements with modern day navigational capabilities.

4. Waterway Description: The WRS is a network of rivers and connecting waterways. From the perspective of natural geography and hydrology, the system consists of the Mississippi River and its numerous natural tributaries and distributaries. The major tributaries are the Arkansas, Illinois, Missouri, Ohio, and Red Rivers. Given their flow volumes, major Ohio River tributaries like the Allegheny, Tennessee, and Wabash rivers are considered important tributaries to the Mississippi system. Before the Mississippi River reaches the Gulf of Mexico, it runs into its distributary, the Atchafalaya River. From the perspective of modern commercial navigation, the system includes the above as well as navigable inland waterways which are connected by artificial means. Important connecting waterways include the Illinois Waterway, the Tennessee-Tombigbee Waterway, and the Gulf Intracoastal Waterway. This system of waterways is maintained by the U.S. Army Corps of Engineers

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(USACE) with a project depth of between 9 and 12 feet to accommodate barge transportation. The WRS in subdivided into two categories; Pooled and Open Water (aka Fast Water). Pooled water is defined as those waters above a Lock and Dam where the water levels are managed through controlled water release mechanisms and spillways. Open water are those portions of the WRS below Lock and Dam management. Water level variations in open water can be extreme.

5. Waterway Design Vessel: For the purposes of defining the navigation requirements and levels of service, the Design Vessel for the WRS is a towing vessel greater than 26 feet in length operating solely on the WRS. Shoal water for the design vessel is 9ft. In accordance with 33 CFR 164, the navigation requirements for a vessel with these characteristics are:

Marine Radar	AIS	Magnetic Compass or Swing Meter
VHF-FM Radio	Charts	Searchlight

6. Level of Service:

   a. The Coast Guard will continue to provide fixed and floating ATON and Automatic Identification System based AIS-ATON in the WRS-Mississippi River System. The overall system should be marked in a manner which is justifiable due to the volume of traffic and the degree of risk in the specific area of the system. While many mariners rely on electronic charting systems (ECS) and global navigation satellite service (e.g. GPS) to establish their position, reliance on ECS does not diminish the need for physical ATON to provide visual indications of currents, shoals, etc.

   b. The Coast Guard will continue to provide AIS-ATON where practicable and useful. AIS-ATON should be used to optimize the overall waterway design, provide resilience, and reduce identified risk. The Coast Guard's use of AIS-ATON recognizes developments in navigation technology. They are meant to be used with radar and AIS transceivers, supplementing electronic chart navigation systems and what the mariner sees out the window visually. While traditional buoys and beacons will continue to be important and relied upon by mariners as visual navigation references on the water, AIS-ATON provide an electronic signal that enhances the use of other navigational equipment such as the radar.

   c. Use of "Mile Boards" on fixed ATON is discontinued. Mile boards should be removed during scheduled/routine maintenance visits.

   d. The findings of the District Eight Fixed and Floating ATON Assessments (enclosure 2) are to be implemented and a Waterway Style Guide will be developed and incorporated into the District Eight Waterways and ATON Management Policy (D8INST M16500.1 (series)) and Tactics, Techniques, and Procedures, D8TTP 20-04A.

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e. District Eight Waterway Managers and ATON units shall consider channels less than 300 feet wide as narrow channels for the purpose of Waterway Design in determining how best to structure and place aids to navigation in accordance with COMDTINST M16500.7 (series) ATON Manual - Administration. Note, this is for waterway design consideration, not a formal designation of sections of waterway as "narrow" in accordance with Rule 9 of the Inland Navigation Rules 33CFR§83.09.

f. Cognizant ATON units and Sectors shall develop "Buoy Templates" for various scenarios (high/low water, ice, etc.) and incorporate them into regional Waterway Action Plans (WAP). The templates shall be closely adhered to by servicing units and changes will be documented/approved at the Sector level. The CG-ECS-I system has the ability to save and store waterway designs for floating ATON for a given water level and should be used in support of this effort.

g. The use of a buoy chart symbol without a corresponding buoy on an Electronic Chart System to mark channels has become routine and expected. Locally, this symbol has become known as a "virtual buoy." This is functionally incorrect and should not be perpetuated. The correct term is "navigation aid" for an instrument, device or nautical publication carried on board a vessel for the purpose of assisting navigation. Based on their routine and expected use by industry and mariners, the Coast Guard will adopt the use of Navigation Aids and formally incorporate them into WRS ATON System. Functionality to add the following Nav Aids (colored circles vice colored buoy shapes) will be added to CG-ECS-I: Port Hand Mark (Green Circle), Starboard Hand Mark (Red Circle), Preferred Channel Starboard Hand (RGR Circle), Preferred Channel Port Hand (GRG Circle), & Special Mark (Yellow Circle). Commandant (CG-NAV) will develop a corresponding recommendation to the IEHG with definitions and proposed symbology.

h. CG-NAV will continue to collaborate with USACE to establish, maintain and discontinue physical and AIS-ATON wherever practical. To facilitate this, CG-NAV may coordinate the provision of USACE vessels with aid positioning resources including CG-ECS-I systems, buoys, sinkers, and other associated hardware when such vessels are establishing or verifying Federal ATON on the Coast Guard's behalf.

7. My POC is [redacted].

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Enclosures: (1) WRS WAMS CG-NAV-3 Memo 16500 of 12 May 2021
(2) Joint USCG D8 and AWO Fixed and Floating ATON Assessment (Feb 2019)

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