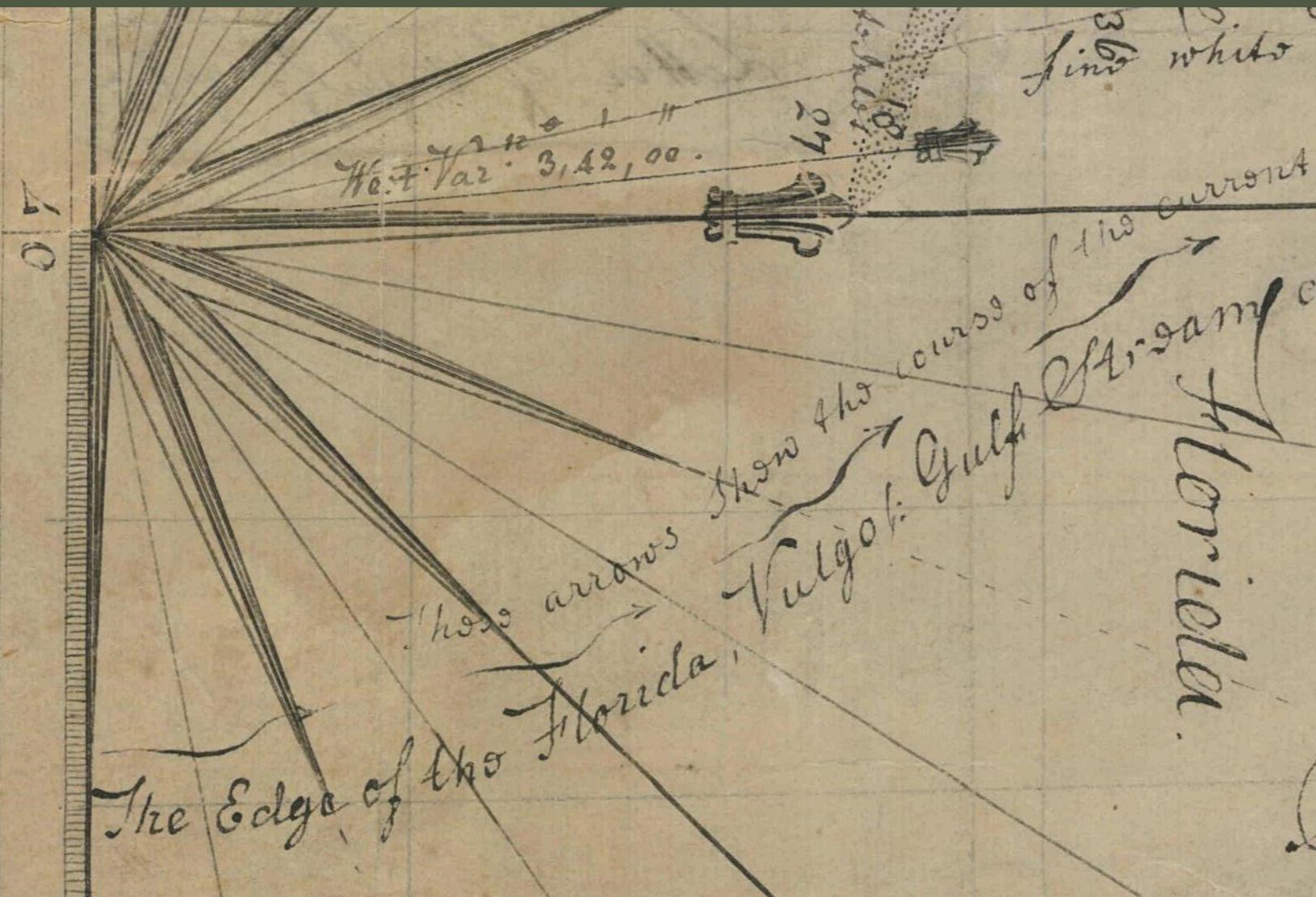


# The Occasional Papers

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## The History of the Gulf Stream's Missing Chapter: John William Gerard De Brahm



Louis De Vorsey

*The Occasional Papers*  
A Philip Lee Phillips Map Society Publication

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Missing Chapter:

John William Gerard De Brahm

Louis De Vorse



## Foreword

Louis De Vorsey (1929-2012) had a long and successful career as an academic. He taught at East Carolina University, the University of North Carolina (1965–1967), after which he joined the geography faculty at the University of Georgia in 1968. Over the next twenty years, he became one of the most distinguished geography and cartography scholars in the United States. He served as President of the Society for the History of Discoveries, and he had co-edited *In the Wake of Columbus: Islands and Controversy* in 1985, a series of essays about places in the Caribbean that may have included the site of the first landfall. A leading authority on historical documents and maps of that era, Professor De Vorsey was called upon by The Library of Congress to write about its holdings that concerned the Age of Discovery. In 1992, his book, *Keys to the Encounter: A Library of Congress Resource Guide for the Study of the Age of Discovery* received the American Librarians Association Award for government publications.

The study of geography, cartography, and history were always part of De Vorsey's life even prior to joining the professoriate. As a young man, he earned an undergraduate degree at Montclair State University in New Jersey, and then completed his master's degree in geography at Indiana University in 1954. Thereafter, he joined the U.S. Navy and entered Navy Officer Candidate School in Newport News, Rhode Island, where he was commissioned as an Ensign and rose to the rank of Commander. His role as a photo-radar navigator took him around the world. He served in Japan, Thailand, Guam, and Alaska. After transferring to the naval reserve, he was assigned to the Naval History Division in Washington, D.C., where he worked on a volume titled *The American Revolution, 1775–1783: An Atlas of 18<sup>th</sup> Century Maps and Charts*; the book was published in 1972.

On a personal note, I knew and worked with Lou for many years on a variety of projects

of mutual interest. Our paths probably first crossed while I was stationed at the U.S. Navy's Fleet Air Photo Lab in Atsugi, Japan. This was the same base from which Lou's Heavy Photographic Squadron Sixty-One often operated. It was not until our work together at the Society for the History of Discoveries, however, that we developed a strong professional and personal relationship. When I established the Philips Map Society in 1995, Lou was one of the first scholars that I asked to serve as an academic advisor. He was an active member and regularly attended its meetings and functions.

We publish Dr. De Vorsey's paper posthumously with great respect and appreciation for his contributions to the Phillips Map Society of which he was a founding member, and for his contributions to the fields of geography and cartography.

Ralph E. Ehrenberg  
Chief, Geography and Map Division

## Preface

As Chief Editor of *The Occasional Papers*, I received a copy of Professor De Vorsey's manuscript in 2014. After reviewing this impressive work that intersected the history of cartography and the history of science, it was clear that he thoroughly researched the collections held by the Geography and Map Division of the Library of Congress and utilized those resources to argue that John William De Brahm was the first to deeply comprehend the Gulf Stream and to label it on a chart, rather than Benjamin Franklin, which has been long accepted as fact. De Vorsey convincingly argues and presents sufficient evidence to support his claim that De Brahm's place in the history of cartography needs to be reconsidered. De Vorsey explains that De Brahm's unfortunate obscurity can be attributed to poor scholarship on the subject of the Gulf Stream that was undertaken in the mid to late 1800s, which has resulted in perpetuating an historical inaccuracy.

De Vorsey is not the first to make this claim about De Brahm. In 1938, Ralph H. Brown, an important historian of cartography and professor at the University of Minnesota, wrote an article for the American Geographical Society titled, "The de Brahm Charts of the Atlantic Ocean, 1772-1776." He championed De Brahm as the first to chart and scientifically describe the Gulf Stream. In 1947, American colonial historian Lawrence C. Wroth, famous for his work *The Colonial Printer*, also favored De Brahm over Franklin. De Vorsey was well aware of these sources and used them as a springboard for his own research. He hoped to succeed where Brown and Wroth had failed in correcting the error. The Georgia-based professor repeatedly explored the topic throughout the course of his thirty-plus-year career.

The information presented in this paper concerns the shortcomings in the scholarship of one Johann Georg Kohl, an eminent scholar, who attributed the discovery of the Gulf Stream to

Franklin, and misrepresented De Brahm's role in the process. In fact, Kohl, who was commissioned by the American government to author a history of North American mapping, yielded no real importance to the work of De Brahm. De Vorsey counters Kohl's assertions and provides a comprehensive account of De Brahm's work on the Gulf Stream that became increasingly sophisticated in its explanation of the phenomenon over time. De Vorsey clearly illustrates a man with a deep connection and dedication to scientific study.

Before I began to work on this paper, I familiarized myself with Professor De Vorsey's previous work related to this subject, in particular, his 1976 article for *Imago Mundi* titled, "Pioneer Charting of the Gulf Stream: The Contributions of Benjamin Franklin and William Gerard De Brahm." This background material was very helpful; however, working on this paper without the assistance of the author posed several challenges. Namely, it was not possible to suggest rewrites to strengthen the copy and to discuss images to supplement the text. As such, I handled any changes with respect and care that I would want as an author. The paper presented here, though shorter than the original manuscript, tightly focuses on the history and facts that support De Vorsey's claim about De Brahm. What has been omitted is a lengthier biographical section on Johann Georg Kohl, the historian responsible for spreading the word about Franklin's accomplishment, while dismissing the work of De Brahm. De Vorsey painstakingly analyzed the mistakes in Kohl's methodology. Rather than include those lengthy detailed accounts, the main points have been summarized. If I had had the opportunity to speak with Professor De Vorsey, I believe we would have arrived at a product that is similar to what is presented in this installment of *The Occasional Papers*.

Ryan Moore  
Chief Editor

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# The History of the Gulf Stream's Missing Chapter



## Introduction

John William Gerard De Brahm (1718-1799) was the first man to thoroughly explore, understand, and chart the Gulf Stream, a work he completed in 1765 and then went on to revise and improve upon throughout his life. This author challenges the popular belief that it was Benjamin Franklin to first make this scientific discovery in 1768. As a consequence of the erroneous attribution to Franklin, De Brahm's place in history has been overlooked. This paper addresses how and when De Brahm discovered and charted the Gulf Stream, and it explains why Franklin instead of De Brahm has received a disproportionate amount of the credit.

Prior to De Brahm, the first mention of the Gulf Stream is attributed to the 1513 expedition of Juan Ponce de León. The Spanish explorer noted in his voyage log: "A current such that, although they had great wind, they could not proceed forward, but backward and it seems that they were proceeding well; at the end it was known that the current was more powerful than the wind." Spaniards, although likely ignorant of the underlying science, utilized the Gulf Stream as a passage to and from the New World. Hernando Cortez was probably one of the earliest of the conquistadors to send large numbers of ships from Mexico northward through the Florida Straits, then eastward following the clockwise motion of the Gulf Stream to return to Spain. In 1685, Everard Werner Happel, known as Happelius, created a chart of ocean circulation and tides. It appears to depict the Gulf Stream but does not label it as such.<sup>1</sup> **Figure 1**

Scientific articulation of the Gulf Stream as a natural phenomenon occurred more than two-hundred years later. The popular version of events is that during a 1768 visit to England, Benjamin Franklin discovered that it took several weeks longer to reach England than it took to reach Rhode Island when returning from England. Franklin's cousin Timothy Folger, a whaling captain, explained that merchant ships routinely crossed the then-unnamed Gulf Stream while



Figure 2

the ships bound for England ran against it. Franklin worked with Folger and other experienced ship captains to chart the Gulf Stream and give it the name by which it is still known today.

Franklin's Gulf Stream chart was published in 1770 in England — where it was ignored — and subsequent versions were printed in France in 1778 and the United States in 1786.<sup>2</sup> **Figure 2**

As tidy a story this may seem on the surface, Franklin had a competitor who was ahead in describing the Gulf Stream. In 1772, De Brahm published, in London, *The Atlantic Pilot*; a project he had started in the 1760s and had spent much time researching independently of Franklin. De Brahm's substantial treatise on the Gulf Stream was followed by additional reports, which improved upon geographic and scientific information in the initial publication. Clearly a major achievement in cartography, it, however, was not given its proper place in history, because subsequent scholarship, specifically the historiographic work by the influential cartographer and historian Johann Georg Kohl.

Kohl was a renaissance man who was famous in his day for his travel writing, scientific work and cartography. From 1854 to 1858, he traveled in the United States, and at the request of the U.S. government, prepared two reports for the Coast Survey: *History of the Discovery of the U. S. Coast* and the *History and Investigation of the Gulf Stream* that were published in Bremen in 1868. His work had a profound impact on the history of mapping in North America. Oddly enough, the revered scholar Kohl relied on information about De Brahm that was not only second hand but derived from an enemy of De Brahm.

The questionable source was Bernard Romans, author of *A Concise Natural History of East and West Florida*, published in New York in 1775. Romans served in De Brahm's employ as an assistant surveyor in the General Survey of the Southern District of British North America.<sup>3</sup> De Brahm's recall to England for a hearing before the Board of Treasury resulted in an ad-

ministrative breakdown that apparently left Romans unpaid for his services. Romans sued De Brahm for financial losses and unfair treatment. *Natural History* gave the aggrieved Romans the opportunity to broadcast those criticisms, and he did exactly that in terms that were patently strident.<sup>4</sup>

After leveling some preliminary critical slaps at De Brahm, whom he derisively styled, “that profound and speculative philosopher,” Romans took off his rhetorical kid gloves and dipped pen in venom. He drew his readers’ attention to *The Atlantic Pilot*, a book he described as “bearing marks of insanity.” Romans continued:

[H]ere we see an account of an unnatural change in the face of the country, which for many reasons never could have happened but in the brain of this Bedlamite, from whence also seems to originate the name of *Tegesta*; he turns one peninsula into broken islands, another into sunken rocks; what a havock of jumbling this Hercules makes! When in this unmeaning *chaos* he joins and disjoins, turns water into land and land into water, calls the current from Baffin’s frozen bay, to join the velocious stream of Torrid Mexico and Florida; and again makes them form a *vortex* reverting back to their points of departure...<sup>5</sup>

Romans continued his diatribe against De Brahm for several pages calling him “this curious raver” whose advice to navigators “seems as if calculated on purpose to destroy ship goods and people.”

Strangely, Kohl accepted this nearly hysterical attack on De Brahm. In light of his acceptance, it is not altogether surprising to find that Kohl was moved to view *The Atlantic Pilot* in less than favorable terms. Kohl, however, should not have rested content with such volatile hearsay evidence. He clearly had an obligation to examine any published text, map or chart that was germane to his study. His research was, after all, being handsomely financed by the U.S. Coast Survey, which afforded him the ability to pursue most sources of information. During the course of his work for the U.S. government, he had assured Coast Survey Superintendent Bache that his second Gulf Stream memoir would include an examination of the exploration of

the current by “De Brahm, Dr. Charles Blagden, and other Englishmen” along with “Williams, Strickland, Pownall and other Americans in the latter half of the 18<sup>th</sup> century.”<sup>6</sup> When it came to De Brahm, this did not turn out to be the case.

While the precise reasons why Kohl failed to consult De Brahm’s work are not known today, it appears to have little to do with a lack of access to the book. *The Atlantic Pilot* was widely available and well received in Europe and America. George Wood, a Charleston bookseller, for example, advertised the arrival of a consignment of copies in his shop on August 6, 1772. Andrew Ellicott, the well-known U.S. boundary commissioner and surveyor of the District of Columbia, in writing of his own experiences with the Gulf Stream verified De Brahm’s findings. Ellicott felt that De Brahm’s ideas and description of the current were, in many respects, more accurate than those of Benjamin Franklin.<sup>7</sup> Even if Kohl had difficulty in finding an original 1772 edition of De Brahm’s *The Atlantic Pilot*, he might have consulted the French version of the work. It appeared in Paris under the title *Recherches Faites Par Ordre De Sa Majesté Britannique, Depuis 1765 Jusqu’ en 1771, Pour rectifier les Cortes & perfectionner la Navigation Du Canal De Bahama*, [1788]. Nevertheless, Kohl failed to review *The Atlantic Pilot*, which led him to make to an erroneous conclusion:

Not much more may be said of the extensive coast surveys executed on the order of the British Government by many distinguished surveyors; for instance Capt. Holland, De Brahm, and many others, - a little before and partly during the Revolutionary War. They all take no notice of the Gulf Stream. De Brahm it is true, as well on his chart (1772) as in his work sometimes mentions the Gulf Stream and has some remarks and speculations on it, . . . But ... he did not find it worth his while to make a regular survey of this interesting section of the Atlantic which according to sound views no doubt ought to have been considered as forming part of the domain of an American Coast survey.<sup>8</sup>

With the stroke of the pen, one man’s important contributions to cartography were thrust into the shadows. Even worse was how Kohl arrived at his conclusion. He committed the car-

dinal sin of research by failing to consult the original source that was without doubt available to a man with access to the world's best libraries. Had Kohl done so, he would have seen a substantive and authoritative description of the Gulf Stream written by De Brahm.

Later scholarship, specifically that of Ralph H. Brown, a leading historical geographer, commented that "even in the exhaustive published and manuscript works of Johann G. Kohl one finds only passing mention of De Brahm . . . ." <sup>9</sup> Brown explained that De Brahm initiated research on the Gulf Stream earlier than Franklin and explored the phenomenon throughout his career. Franklin's contribution was the study of "ocean current temperatures." <sup>10</sup>

Nor would Lawrence C. Wroth have been moved to bemoan the unjustly singular position Benjamin Franklin has enjoyed in the standard histories of Gulf Stream research and charting, in the following statement: "It is upon De Brahm's printed work [*The Atlantic Pilot*, 1772] and its charts and upon [his] manuscript continuation that one may rest his belief in the royal surveyor's right to be mentioned with Franklin in any discussion of the history of scientific interest in the Gulf Stream. It seems certain that De Brahm did a great deal more work on the problem than Franklin thought of giving to it." By ignoring the chart of the Gulf Stream published by De Brahm in *The Atlantic Pilot* in 1772, Kohl helped assure to Benjamin Franklin the undeserved historical honor of *publishing the first* Gulf Stream chart, an honor that rightfully belongs on De Brahm's escutcheon. . <sup>11</sup>

## De Brahm and the Gulf Stream

In 1764, De Brahm was appointed as Surveyor General of the New British Colony of East Florida, as well as of the Southern District of North America. He was given responsibility for the surveying and mapping of “all His Majesty’s territories on the continent of North America, which lye to the south of Potomac River, and of a line drawn due west from the Head of the main branch of that River as far as His Majesty’s Dominions extend.” Within this huge area priority was placed on “that part of the Province of East Florida, which lyes to the south of St. Augustine, as far as the Cape of Florida, particularly the lands lying near Establishments which have been proposed to be made in that part of the country.”<sup>12</sup>

In 1763, Spain surrendered Florida to England. The territory, however, was *terra incognita* to the royal advisors charged with formulating policies to accelerate its profitable incorporation in King George’s newly expanded empire. De Brahm’s surveys and maps would be, he was told, “in great measure the guide, by which His Majesty and his servants are to form their judgements upon the different proposals that shall be offered for making settlements upon these Coasts.”

During the autumn of 1764, De Brahm prepared to undertake his first expedition along the Florida coast that would put him on a path to encounter the Gulf Stream. In his first lengthy report to the Board of Trade, dated April 4, 1765, De Brahm stated that his survey operations began “on January 30, 1764, with the taking of the Latitude of St. Augustine.” In his discussion of the recommended navigational approach to St. Augustine from seaward, De Brahm mentioned the Gulf Stream for the first time:

The best Entries are made with an Easterly Wind, which raises the Sea to stand with 8 feet perpendicular in the Channel of the Bar, at Dead low water [.] All South Easterly Winds favouring in a Measure more or less the Entries and make the Breakers very Smooth by virtue of the Gulf Stream being pressed &

bent nearer to the Coast on which the Sea is then very considerably raised, but any North or N:ely especially the N.E. Wind makes a low & rough Sea, and the Breakers by Default, of the Gulf Stream and the Seas on shore in consequence; being bent off which makes the water shallow on this Coast.<sup>13</sup>

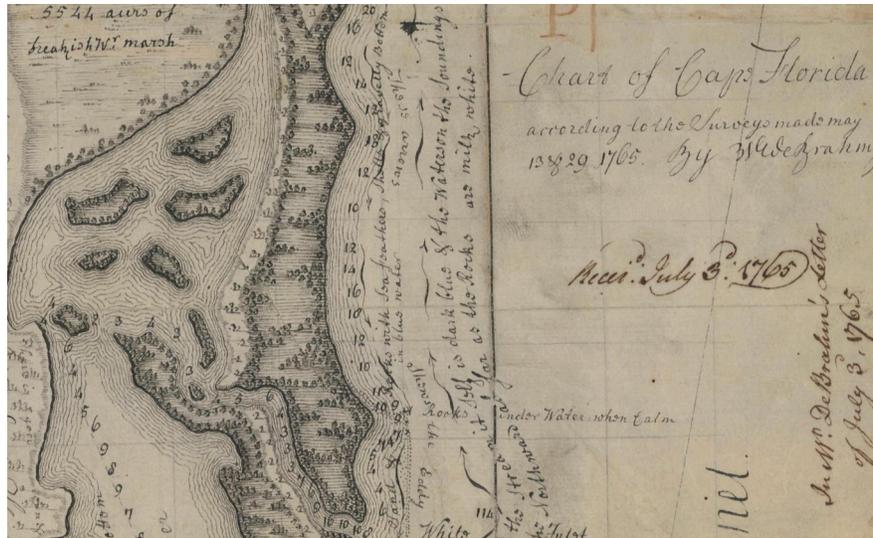
Many navigators sailing to the Florida and Georgia coast in the first half of the eighteenth century employed the term Gulph or Gulf Stream in a familiar way. A typical example is found in a letter written by Georgia's founder, James Edward Oglethorpe, in 1735. Oglethorpe, advising on the best passage from England to Georgia, warned, "... if he falls to the northward, he cannot beat up from Charles Town to Tybee against the Gulph Stream without great difficulty..."<sup>14</sup>

De Brahm's Report of April 4, 1765 included a no longer extant "map beginning from this Bay (St. Augustine)," which he said, "Will fully display Matters hereto stated." The chart was likely lost in storm that nearly cost De Brahm his life. He wrote, on March 13, 1765, "separated from the Barge & cast off the coast though the Gulf Stream about the ocean till the 20<sup>th</sup> March when with the Divine hand [I] was brought into St. Augustine Bay."<sup>15</sup> From the remarks and comments quoted here, there can be little doubt that De Brahm, by early 1765, was familiar with the Gulf Stream as a constant north-flowing lateral current along the coast where it is closest to the shoreline of North America.

After recuperating and refitting his battered vessels, De Brahm resumed surveying the coast south to Cape Florida. Fortunately, the detailed manuscript charts prepared on his second expedition are extant and available for study. Rather than being found in the British Public Record Office, British Library or some other English repository, this collection of De Brahm's charts was discovered in the Library of Congress Geography and Map Division files. They were coincidentally stored in close physical proximity to the Kohl Collection. There can be little doubt that these charts were acquired by the collector, Peter Force, during the early nine-

teenth century. Force’s enormous collection of Americana came to the Library of Congress upon its purchase by Congress in 1867.<sup>16</sup>

The chart included here bears the title “Chart



**Figure 3**

of Cape Florida according to the Surveys made May 13 & 29 1765 By W G De Brahm. On the chart in a different ink and hand, is the note “Recev’d July 3d 1765.” **Figure 3** De Brahm’s skillful pen accomplished a *trompe l’oeil* in appearing to scroll the verbal geographic description away from the cartographic depiction of the area now occupied by modern day Miami and Miami Beach.<sup>17</sup> The significance, however, is that he included the Gulf Stream in both elements of this carto-document. After giving the latitude, longitude, and compass variation for Cape Florida in his descriptive text, De Brahm pointed out that the Cape, “has its name common with the Florida, Vulgarly called Gulf Stream.” He continued by explaining that the Gulf Stream was “wheeled by the Trade winds round & out of the Gulf of Mexico along the Southern, Western and Eastern Coast of Florida.” On his chart, De Brahm included a series of wavy arrows he explained in the following text, “These arrows show the course of the current of the Florida Stream setting North.” Along the seaward side of the arrow train he noted: “The edge of the Florida, Vulgo: Gulf Stream distinguished here by a celadon green whilst the stream itself is dark blue & the waters on the soundings to the Northward as far as the Rocks are milk white.” **Figure 4**



Thus, it can be concluded that, by the early months of 1765, De Brahm formulated theoretical and practical knowledge of the Gulf Stream far beyond anything that Kohl later attributed to him. Surveyor General De Brahm had indeed found the Gulf Stream to be an important phenomenon “forming a part of the domain of an American coast survey” some few years before Benjamin Franklin and Timothy Folger compiled their famous map of the ocean current.<sup>18</sup>

The considerable, and at times conflicting, demands of his two offices, East Florida and the Southern District, began to cause serious problems in the years following 1765. De Brahm’s divided allegiance and sometimes imperious behavior soon became the cause for bitter criticism on the part of the new colony’s governor, Col. James Grant. De Brahm’s feud with the governor continued to escalate in bitterness until they almost came to blows in the presence of the commander of the Royal Army brigade stationed in St. Augustine. With the support of his council, Grant suspended De Brahm from his provincial post on October 4, 1770. The affair had reached such a serious turn that, in 1771, the Secretary of State for the colonies summoned De Brahm to London for a hearing.

With characteristic resilience, De Brahm seized on the enforced voyage to London as an opportunity to test his developing theories concerning the Gulf Stream and other Atlantic phenomena. After all, he reasoned, his suspension involved only his provincial office and in no way should he cease functioning as Surveyor General of the Southern District. Departing Charleston on July 24, 1771, aboard the *Polly*, De Brahm spent the next six weeks making observations and compiling data for a map of the Atlantic and “Table of Loxodromy and Observations, from which the Map of the Atlantic Ocean is laid down.”<sup>19</sup> Once in London, De Brahm lost no time in broadcasting his recent findings in a letter addressed to “Mr. Urban” the editor of *Gentleman’s Magazine*, one of the capital’s leading journals. The letter appeared on page 436

of volume 41 (1771) under the heading “Mr. Brahm’s Observations on the American Coast.”

Had Kohl read it, he would have learned a great deal concerning De Brahm’s attempts to make the Gulf Stream known to the fraternity of practical navigators:

Mr. Urban,

When I, during last winter and spring, was finishing my surveys of the Martiers on the Promontory of East Florida, I settled its longitude by that of Charles Town in South Carolina, which, by a tedious survey, I had carried from Charles Town Lighthouse to Cape Florida and the dry Tortugas, but could not reconcile it with the longitude of the Havannah; [I] was therefore constrained to undertake July last, a more tedious expedition across the Atlantic ocean to the Start Point in the English channel, which I accomplished the 7<sup>th</sup> of this month (September); by which I have not only obtained the true West longitude from London to Cape Florida differing 1°56’43” from the commonly known longitude between London and Charles Town Light-house, which I bring in West longitude 80° .42’, 43” from the London Meridian, and answers completely to the bearings from Cape Florida to the Havannah, but have also traced the Florida, commonly called Gulf Stream, with all its windings from the dry Tortugas, the westernmost of the Martiers along the Atlantic coast to the Newfoundland bank; likewise all the different deviations of the magnetical from the solar amplitudes, as also the precise latitude and longitude near America of [the line of] no variation: vessels bound from any part of America through the new Bahama channel to Europe, may take the benefit of that stream, which will not only guide them clear of all shoals projecting from the Capes on the coast of North America, but also accelerate their voyage in a near incredible measure from twice to six times the distance to what I found by my hexodromie, when corrected by my daily observations. As I am convinced of the utility my discovery affords to the public, I would not lose a day to communicate it to your publication.

I am, Sir, your most humble servant,  
Wm. Gerard de Brahm,  
his Majesty’s Surveyor General for the Southern  
district of N. America.<sup>20</sup>

## The Atlantic Pilot

In 1772, De Brahm published his “discovery” in his book titled, *The Atlantic Pilot*. With the text were three highly original maps based on his Florida surveys and Atlantic observations. His “Hydrographical Map of the Atlantic Ocean, Extending from the Southernmost part of North America to Europe,” was the first published chart to show the Gulf Stream as a continuous major oceanic feature in the Atlantic. **Figure 5**

The “Hydrographical Map of the Atlantic Ocean” was entirely the product of De Brahm’s genius. He symbolized the Gulf Stream by a ribbon of closely spaced wavy lines issuing forth from the Gulf of Mexico that turn sharply north and parallel to the coastline of Florida and Georgia before heading to the northeast to join a similar but slightly broader ribbon flowing past Cape Farewell and the Azores Islands and arcing to the southern edge of the chart. In light of his statements concerning effects of strong winds and storms in causing lateral shifts in the Gulf Stream, it would appear that, unlike Franklin, Jonathan Williams, John Pownall and other early Gulf Stream chart makers, De Brahm was avoiding the implication of what might be termed a “river in the ocean” model. Rather than representing the Gulf Stream with distinct confining edges or “banks” formed by the cooler water through which it flowed, De Brahm’s cartographic pattern of a ribbon of wavy lines becoming less distinct as they grow more distant from the core seems to presage cartographic techniques used a century and more later. On more modern navigation charts cartographers often have opted to show the “main axis” or swiftest flowing core of the Gulf Stream by a heavy dashed or some other line pattern and omit the often ephemeral “edges” or outer limits of the flow as favored by Franklin's chart and those following it.

When the text of *The Atlantic Pilot* is read, it becomes clear that De Brahm’s theory

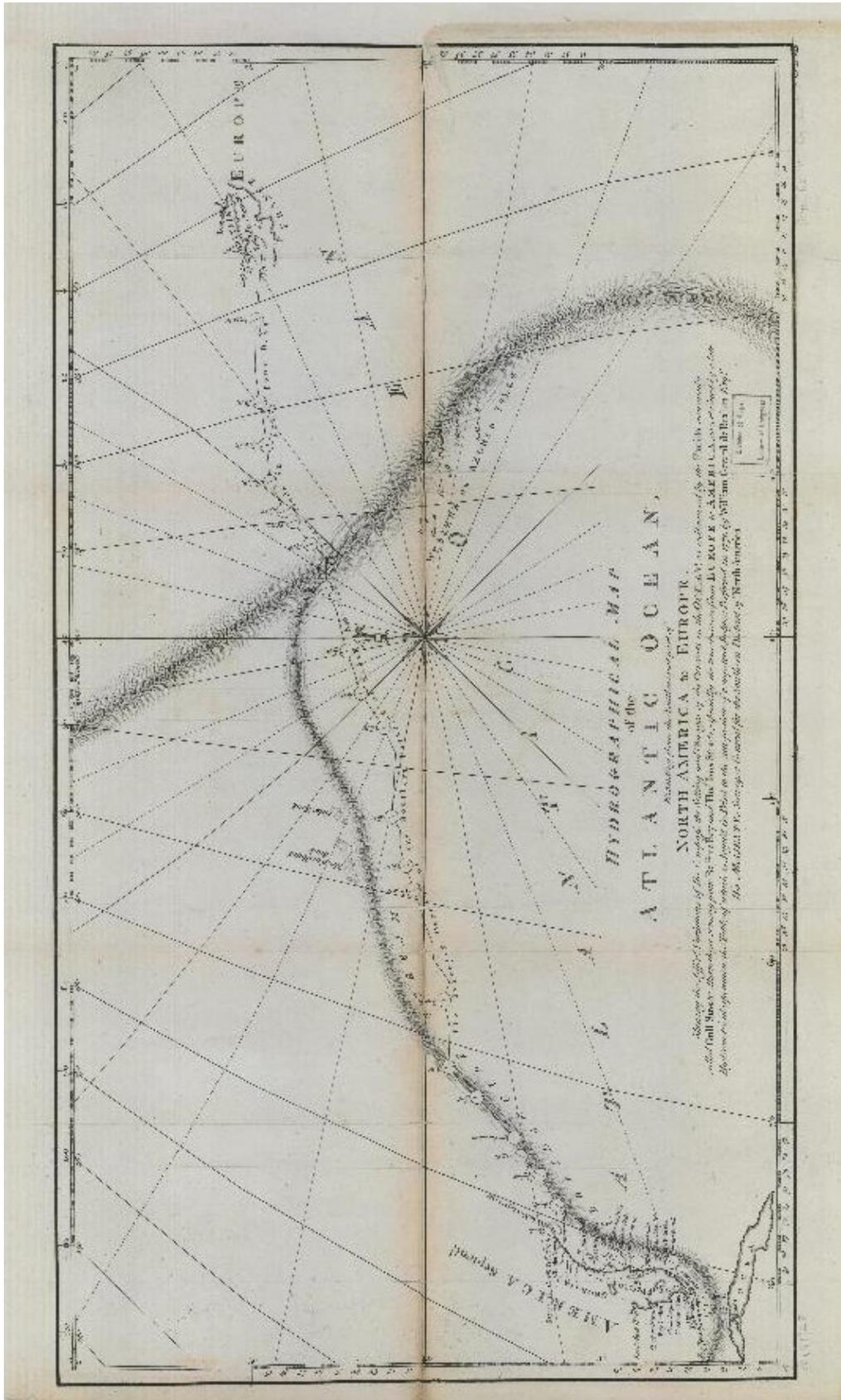


Figure 5

concerning the Gulf Stream, along with his cartographic depiction, had become somewhat more sophisticated in the years since 1765. In the *Atlantic Pilot* he wrote:

The great weight of the sea inclosed within the vast extent of the Mexican gulf is set in agitation by the trade-winds, as is generally agreed; whereby the famous Florida stream is supposed to be effected, and thence called Gulf stream; . . . but this stream is in reality carried into the gulf of Mexico by these trade-winds, and therein circulates at large; but at the place of its issue, anxiously compressed by the islands Cuba and Bahamas on one side, and the promontory on the other, is constrained to curb its current suddenly and often, in order to take its vent on the east side of the said promontory at Cape Florida, through New Bahama channel into the Atlantic, with a N. b. E. direction; which direction at Cape Canaveral, in latitude 28°20'50", it exchanges with a N. N. E. course, in which it continues as far as Charles-Town, from whence it runs with a N. E. turn to latitude 42° and 68° west longitude from London, then E. b. N. to the bank of Newfoundland, and unites, about 40° west longitude from London, with the currents issuing out of St. Lawrence's Gulf, Baffin's Bay and Hudson's Straits, with which it takes a S. E. departure towards the western islands, probably joins the current setting out of the strait of Gibraltar, and proceeds as far as the coast of Africa, until it falls in with the trade-winds again, and returns, after its rotation in the ocean, to the Gulf of Mexico. North and N.E. (winds) as also east winds press the Florida stream home to the Atlantic coast, and confine it in a very narrow channel; at which times it runs like a torrent. S.E. and south winds give less motion to the natural current of the stream, because it then runs in its natural channel, is wider, as also distant from the shore, on which distance part of the stream returns by an eddy southwardly. S.W. west, and N.W. winds extend the stream still farther into the ocean, consequently beyond its natural eastern boundary; by which its current is but moderate, having that motion diminished, which is caused by the pressure it receives in its confinement between the islands Cuba, Bahamas, and the promontory.<sup>21</sup>

Rather than simply a swift current "wheeled by the Trade winds round & out of the Gulf of Mexico . . ." that he wrote of in 1765, De Brahm, in 1772, was describing an Atlantic surface circulation gyre of truly oceanic proportions. Perhaps even more important, in view of Kohl's misguided criticisms of his contributions, was the fact that De Brahm went beyond theoretical considerations and provided navigators bound from the Americas to Europe with a chart showing the current, "which will not only guide them clear of all shoals projecting from the Capes on the coast of North America [but also] accelerate their voyage in a near incredible measure."<sup>22</sup>



## Improving the Description

After a delay of more than two years, De Brahm received his administrative hearing and was exonerated of Governor Grant's charges and fully reinstated in his provincial office. In addition to publishing *The Atlantic Pilot*, De Brahm filled his months in London by completing several other projects, some of which grew directly from his interest in the Gulf Stream. One of these was a chapter in the elegantly illustrated manuscript he titled "Report of the General Survey in the Southern District of North America." De Brahm had the honor of personally presenting to King George the most noteworthy achievements of his surveying activities in the colonies of South Carolina, Georgia and East Florida. Chapter seven of the East Florida section of his report was headed, "Necessary Direction for Navigation in the Florida Stream, from the Gulf of Mexico, upon the Eastern Coast of East Florida, Georgia and South Carolina, etc., or the Atlantic Pilot."

As its heading suggests, most of the contents of this chapter echo the text he published under the title *The Atlantic Pilot*. A reading of the manuscript makes it clear, however, that it was written after and includes corrections to the published version. For example the latitude of Cape Canaveral is given as simply 28°20'50" in the published version but as 28°22',09" by "Survey" and 28°20'50" by "Observation" in the report. The 28°22'09" position De Brahm obtained by "Survey" is somewhat closer to the 28°28' position given in many present day gazetteers of maritime positions.

Perhaps the most revealing aspect of De Brahm's manuscript report, insofar as the Gulf Stream is concerned, is the chart it included. Although its title is identical to the one in *The Atlantic Pilot*, the manuscript version contains important features not found in the published chart. As a close examination of the manuscript, "Hydrographic Map of the Atlantic Ocean"

will confirm, De Brahm included arrows to indicate the direction of the current flows represented by his ribbon of wavy line symbols. Also, the Atlantic current gyre is drawn to indicate its entry into, and circulation out of, the Gulf of Mexico. The inclusion of these elements produced a chart that is more revealing of his true understanding of Atlantic currents than the earlier engraved version published in *The Atlantic Pilot*.

## *The Levelling Balance and Counterbalance*

Although De Brahm's manuscript "Report" was not readily available to Kohl while he was compiling his Gulf Stream study, a thoroughgoing bibliographic search might have enabled him to find another book that the Surveyor General had published in London in 1774. This publication was *The Levelling Balance and Counterbalance*. During his London stay De Brahm was in touch with the scientific avant-garde of the day and aware of cutting edge research taking place involving the use of the mercurial barometer in the determination of terrestrial elevation. Eager to employ this new discovery in his surveying efforts, he compiled a set of tables described as his "Physical System of the Variation in the Mercury in the Barometer." As De Brahm explained, "considering the precariousness which I have too often experienced by setting out on extensive surveys with a single set of mathematical apparatus, I concluded it equally as dangerous to depend on a manuscript of Tables, which I have calculated with unwearied and uninterrupted application, I have therefore thought it prudent to have of so tedious elaborations [a] few copys made in print of my Atmospherical Tables."<sup>23</sup>

While not directly concerned with the Gulf Stream, *The Levelling Balance and Counterbalance* contained a map centered on the Atlantic Ocean that included a depiction of the current system. As the map included on the book's title page reveals, De Brahm used his usual ribbon of wavy lines to show a complete North Atlantic circulation gyre. The most noticeable change in De Brahm's 1774 Gulf Stream cartography, however, is to be seen in the Arctic current's location. Whereas his earlier charts showed a current flowing south from "St. Lawrence's Gulf, Baffin's Bay and Hudson's Straits" to join the Gulf Stream, the 1774 chart shows the boreal current flowing from the "Icy Sea" north of Siberia past "Iceland" and "The British Isles." Unfortunately, the nature and purpose of *The Levelling Balance and Counterbalance*

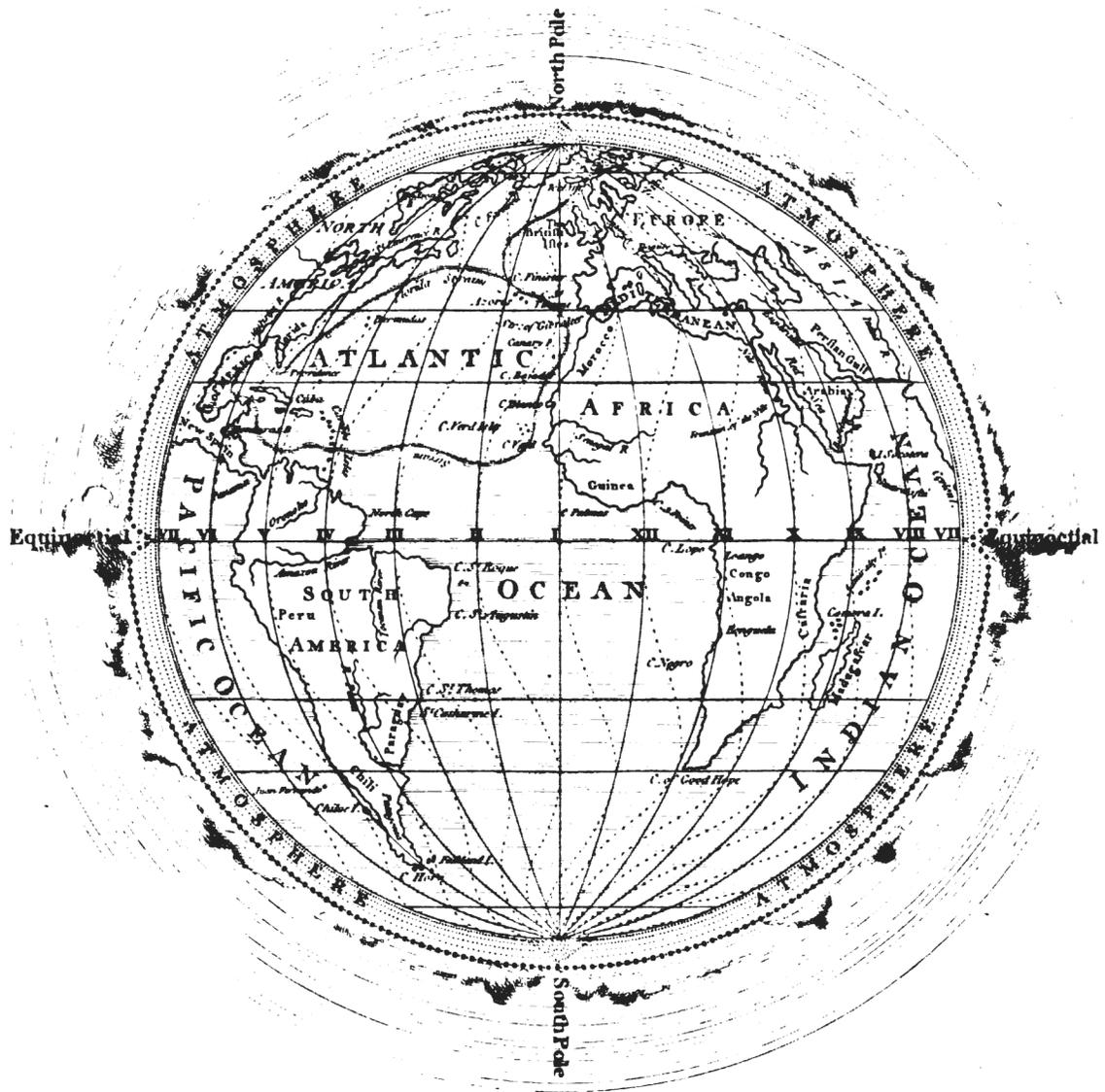


Figure 6

did not provide De Brahm with a need or opportunity to give his reasons for this change in his Atlantic surface circulation model. **Figure 6**

In addition to reappointment to office, De Brahm was provided with an armed ship, newly named *Cherokee*, for his return and continuation of the general survey in North America. The doubtlessly elated, De Brahm reported on December 1, 1774 that only the need of a commander and crew to man the *Cherokee* was delaying his return to his American surveys. Securing captain and crew, De Brahm reached the waters of the Atlantic on July 3, 1775.

The ensuing voyage to Charleston was in no way a simple Atlantic passage for the *Cherokee* and her party. On the contrary, De Brahm employed the several weeks of the voyage to conduct an incredibly ambitious oceanographic survey. Upon arrival in Charleston, he reported to a superior in London the completion of a lengthy manuscript report of his findings titled “The Continuation of the Atlantic Pilot.” De Brahm wrote:

I have during my unhappy confinement in this place made out my Report on 160 pages in folio containing all my astronomical and physical observations made between Greenwich and America laid down in 88 tables to be submitted to the best Judges.<sup>24</sup>

De Brahm’s allusion to “unhappy confinement” came from the fact that the American Revolution was beginning as the *Cherokee* arrived in Charleston. South Carolina’s Royal Governor and his party took over the ship as a refuge. They put De Brahm and his party ashore where he became a prisoner-at-large for two years.

De Brahm’s letter went on to describe his chief accomplishments on the voyage:

The results from the observations are *first* the Different changes of Magnetic Azimuths from Europe to America on both sides [of] the No Variation Line, which I have crossed three times and once touched. *Secondly*, the System of the Great Stream with its mean circulation along the European and African Coast, across the Atlantic Ocean between the Tropic and Equator to America, and after washing these shores, its returning across the Atlantic ocean from the northern parts of America to the Northern parts of Europe[.] The *third* is the change of weight in

the Atmosphere upon the weather to come.<sup>25</sup>

De Brahm's research agenda originally called for only two of these major headings – magnetic declination at sea and surface current circulation. Added to his daily observations were the temperature and barometric pressure of the oceanic atmosphere. De Brahm was among the pioneers in the use of the mercurial barometer in meteorology.

The opening paragraph of De Brahm's manuscript, "The Continuation of the Atlantic Pilot," summarized his newfound understanding of the Gulf Stream. He wrote:

In my Directions under the name of the Atlantic Pilot, I have partly accounted for the current known by the appellation of Florida, or commonly called, the Gulf Stream, I now endeavour to treat that subject more fully, and to trace the whole Stream which, when performing the General Surveys in the Southern Latitudes, I have traced from the Dry Tortugas, the westernmost extent of the Florida Keys, that is to say, from the Gulf of Mexico, as far north as Latitude 38° by Observation, and as far East as 69° West Longitude from London by Account; in this Latitude and Longitude, this current proceeded farther to the Northward, then the ship *Polly* . . . in which I went to England (in 1771), departed East.<sup>26</sup>

Following the 1775 voyage, De Brahm became convinced that his theories concerning the Gulf Stream's position as a component in the grand system of Atlantic surface currents were correct. Never one to miss an opportunity to gain favor with the politically powerful, he named the North Atlantic surface circulation system "George, in Honor of His Majesty King George the 3<sup>rd</sup>, my most gracious Sovereign." Perhaps feeling a need to give his chosen name some scientific basis he added, "because it became more precisely known to me when I met its issue out of St. Georges Channel." To clarify the circulation system he had discovered and named, De Brahm prepared a "Chart of the Atlantic Ocean with its Currents and Eddies, also part of the No Variation Line laid down Astronomical and Physical Observations of Longitude, Latitude and Magnetic Azimuths made on board his Majesty's armed Ship the Cherokee." This chart is included with his manuscript, "Continuation of the Atlantic Pilot."

De Brahm's last chart of the Atlantic surface current gyre he named "George" should be studied as the following extract from "The Continuation of the Atlantic Pilot" is read:

This George Stream, circulates along Europe, Africa and America to the South of Latitude 23° and to the North of Latitude 45° and has its Center in the Ocean in Latitude 34° and Longitude 40° West from London. The strength of this Stream depends on places of Reinforcement via at the outlet of the Gulf of Mexico, at the meetings of the branches of the North America Gulfs, and out of the European Seas. It depends also on Seasons of prevailing South, North, East and West Winds as for instance, South Winds keep this Stream within its mean Channel, in a moderate Current with Eddies on both Sides. North Winds confine it near the European, African and American Shores, and increase the strength of its currents, but leaves no room for Eddies between the Stream and the Coasts. N.E. and East Winds (from my experience) bring the stream in the narrowest Channel home to the American Shores, this Current has at that time its greatest velocity; whence I conclude, that N.W. and West Winds have the same effect upon the Current of George Stream on the banks of Europe and Africa, but the near central or inside Eddy of this Stream, I apprehend, is not subject to any Vicissitude, but keeps its rotation in an opposite direction from the Streams Current, and in equality of Velocity (being one set in action) the smallest supply will be sufficient to conserve a motion within itself; whence it may happen, that the Eddy in some places is of greater Activity, than the Streams Current at the same place, especially on distances of the Stream's trajects from Africa to America, and from the latter to Europe, where the Current of the Stream must prove itself to be of the least Velocity.<sup>27</sup>

On his chart De Brahm marked the axis of "George Stream" (the North Atlantic surface circulation system) with a compass rose at the intersection of the 34<sup>th</sup> parallel and 40<sup>th</sup> meridian. Although he had never sailed in the southern hemisphere, he showed no hesitation in predicting the presence of a circulation gyre similar to his George Stream formed by the waters of the South Atlantic:

This stream ranging the Eastern Coast of the Atlantic Ocean (North), would infallibly traject the Torrid Zone, and enter the Southern Seas, were it not for the Trade Winds on both sides the Equator, and a contré acting power of an undoubted similar Stream, in the Southern Hemisphere. These winds by favoring and promoting their own Stream, resist the opposite Winds and Stream, so that both Streams & Winds are confined to their respective Hemispheres.<sup>28</sup>

Any earlier uncertainty De Brahm may have had concerning flows of northern waters contrib-

uting to the George Stream gyre was now resolved in his mind. This can be confirmed from the following passage in “The Continuation”:

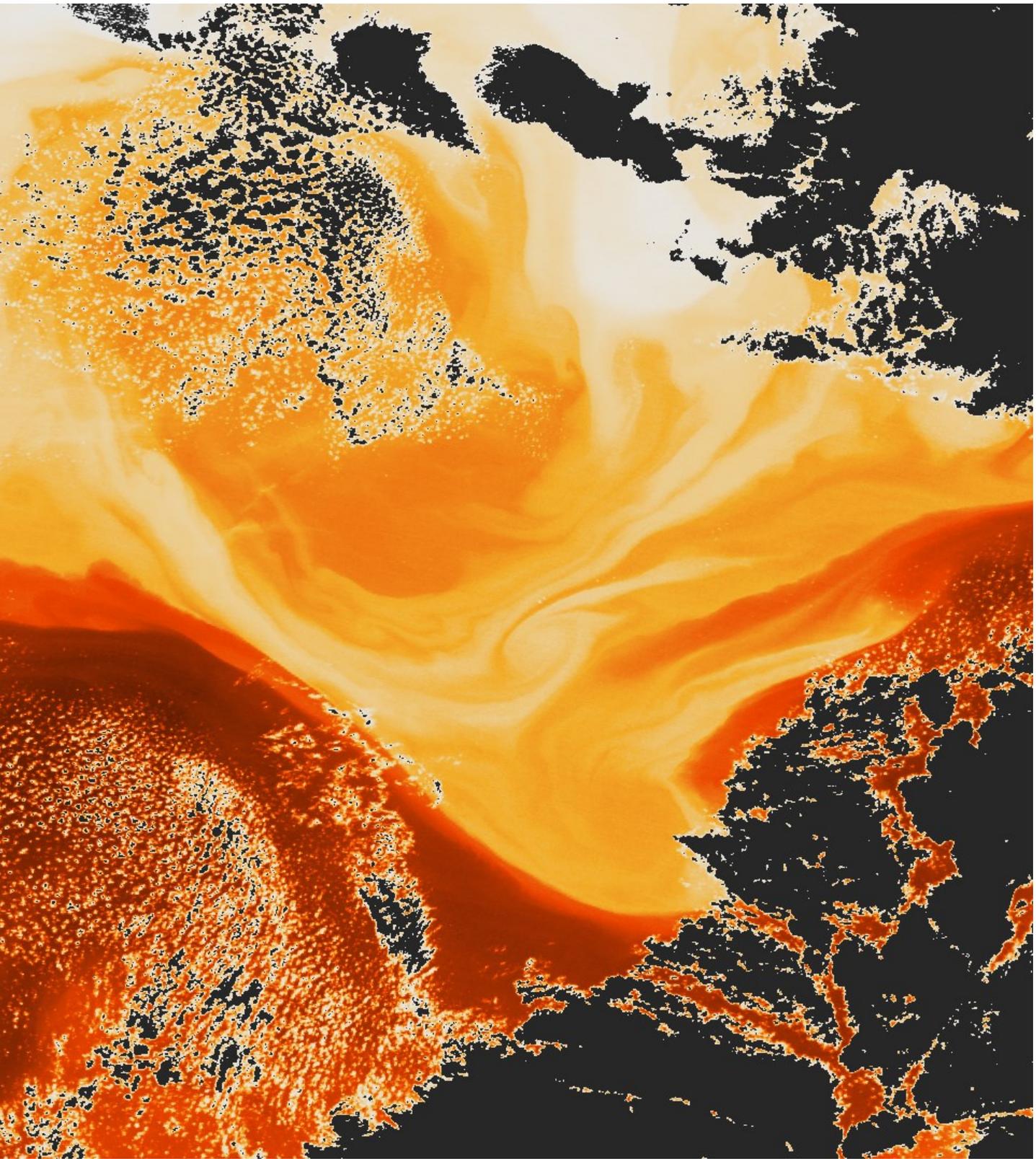
When I first experienced that the Current on the Western Atlantic Coast, with great Velocity did set to the Northward, I inclined to the extinction of this Phenomenon, in the most Northern Latitudes, but meeting at this place a strong Current which set Southwardly, I began to consult the information of the many Waters, issuing out of immense Sources, as well, as those dissolved in the great Northern Reservoirs, from Snow and Ice, forming immense Waters in their Season out of the Gulfs of St. Lawrence, Hudson and Baffin . . . Bays also out of the Icy, North, Baltic and Mediterranean Seas, into the Atlantic Ocean.<sup>29</sup>

## Conclusion

In a holograph letter dated in 1798 and attached to his manuscript, “Continuation of the Atlantic Pilot,” De Brahm wrote, “this . . . contains my last expedition establishing the system of the Atlantic currents in the Ocean of the Northern Hemisphere.” De Brahm died at his estate “Bellair” near Philadelphia in the summer of the following year, 1799. Before his death, he lamented that his papers “have long remained unrequested in my possession.”<sup>30</sup> In his lifetime, De Brahm brought the study of the Gulf Stream and Atlantic surface circulation to a level that was not improved upon until the work of James Rennell, the English geographer, historian, and pioneer of oceanography, almost a half century later. Certainly De Brahm deserves a place in the annals of the scientific exploration of the Atlantic Ocean and Gulf Stream, denied him by Johann Georg Kohl.

Much more could be written concerning De Brahm’s scientific investigation of the Gulf Stream and its position in the North Atlantic surface circulation system, which was sophisticated for its day. That being said, however, I believe I have presented sufficient evidence to support my claim that he scientifically described and cartographically depicted the Gulf Stream. Had Johann Georg Kohl pursued more responsibly the bibliographic clues provided by Bernard Romans, there can be little doubt that De Brahm’s detailed Gulf Stream analyses and cartography would have merited major coverage in Kohl’s “History of the Gulf Stream.” And had Kohl, by diligence or good fortune, discovered De Brahm’s manuscript, “The Continuation of the Atlantic Pilot,” there can be little doubt that it would have warranted at least a full chapter or more in his influential “A History of the Gulf Stream.”





**Figure 7** *Highly detailed satellite image of the Gulf Stream.* Infrared image from the Suomi NPP satellite on April 16, 2013, centered around 180 miles due east of Atlantic City, NJ. Courtesy of NASA/NOAA



## Endnotes

1. National Oceanic and Atmospheric Administration, "Who First Charted the Gulf Stream." See: <http://oceanservice.noaa.gov/facts/bfranklin.html>
2. *Ibid.*
3. Louis De Vorsey, *De Brahm's Report Report Of The General Survey In The Southern District of North America*, (Columbia, S.C.: 1971), 48.
4. Kathryn E. Holland Braund (ed.), *Bernard Romans, A Concise Natural History of East and West Florida*, (Tuscaloosa and London: 1999). See Braund's discussion of Romans' excessive criticism, 46-49. Among the writers who commented on Romans' penchant for hyperbole in his criticism was Philip Lee Phillips, first Superintendent of the Library of Congress Hall of Maps. Phillips editorialized, "we wonder at the outspoken denunciation for seemingly trivial subjects." See, P. Lee Phillips, *Notes on the Life and Works Of Bernard Romans*. A Facsimile Reproduction of the 1924 Edition with an Introduction and Index by John D. Ware, Bicentennial Floridiana Facsimile Series (Gainesville: 1975), 73.
5. Bernard Romans, *A Concise Natural History Of East and West Florida*, A Facsimile Reproduction of the 1775 Edition with Introduction by Rembert W. Patrick, (Gainesville: 1962), 297.
6. U.S. Coast and Geodetic Survey, *Report of The Superintendent ... The Year 1855* (Washington: 1856), 10.
7. Andrew Ellicott, *The Journal of Andrew Ellicott: Late Commissioner of behalf of the United States*.(Florida: Budd & Bartram for Thomas Dobson, 1803), 258.
8. J.G. Kohl, "The History of the Gulf Stream from Columbus to Franklin," MS in Geography and Map Division, Library of Congress, Vol 1., 111.
9. Ralph H. Brown, "The De Brahm Charts Of The Atlantic Ocean, 1772 – 1776," *The Geographical Review*, vol. XXVIII (January, 1938), 124.
10. *Ibid.*, 132.
11. Lawrence C. Wroth, *Some American Contributions to the Art of Navigation, 1510 – 1802* (Providence: 1947), 29-30
12. De Vorsey, *De Brahm's Report* ,33.
13. *Ibid.*, 104.
14. Oglethorpe to James Verelst, 3 December, 1735, *Colonial Records of Georgia* vol. 21, 49. Note, Tybee is an island at the mouth of the Savannah River and "beat up" meant to sail

against the Gulf Stream.

15. Louis De Vorsey, *De Brahm's Report*, 38.
16. Louis De Vorsey, "La Florida Revealed: The De Brahm Surveys of British East Florida, 1765 – 1771," in Ralph E. Ehrenberg (ed.), *Pattern and Process: Research in Historical Geography*. (Washington: 1975), 87-102.
17. French for "deceive the eye," it is an art technique that uses realistic imagery to create the optical illusion that the depicted objects exist in three dimensions.
18. In his role as Assistant Postmaster to the colonies, Franklin had his cousin Timothy Folger sketch the Gulf Stream on an old chart of the Atlantic in 1768.
19. Louis De Vorsey, *The Atlantic Pilot [Bicentennial Floridiana Facsimile Series]*, (Gainesville, FL: 1974), 26.
20. *Gentleman's Magazine XLI* (1771), 436.
21. De Vorsey, *The Atlantic Pilot*, 6-8.
22. *Ibid.*
23. De Vorsey, *De Brahm's Report*, 49.
24. *Ibid.*
25. *Ibid.*
26. Louis De Vorsey, "William De Brahm's Continuation of the Atlantic Pilot," in Sears and Merriman, *Oceanography the Past*, 726.
27. W.G. De Brahm, "Continuation of the Atlantic Pilot," unpublished ms., Houghton Library, Harvard University.
28. *Ibid.*
29. *Ibid.*
30. Brown, *De Brahm Charts*, 132.

## Map Figures and Illustrations

**Cover** Portion of De Brahm's "Chart of Cape Florida according to the Surveys May 13 & 29 , 1765," [*Charts of the coast of Florida*]. Library of Congress. G3932.C6 svar .D4

**Figure 1** Eberhard Werner Happel, "Die Ebbe und Fluth auff einer Flachen Landt-Karten fůrgestellt." From, *Everhardi Gverneri Happelii Mundus mirabilis tripartitus* (Ulm: M. Wagner, 1687-89). Library of Congress. G114.H25

**Figure 2** Benjamin Franklin, Timothy Folger, et al, [*Franklin-Folger chart of the Gulf Stream*] (London: ca. 1768). Library of Congress. G9112.G8 1768 .F7

**Figure 3** "Received 1765..." From "Chart of Cape Florida according to the Surveys May 13 & 29 , 1765," [*Charts of the coast of Florida*]. Date is evidence that De Brahm preceded Franklin.

**Figure 4** Portion of De Brahm's "Chart of Cape Florida according to the Surveys May 13 & 29 , 1765," [*Charts of the coast of Florida*]. "Gulf Stream" appears in the lower left corner of the chart.

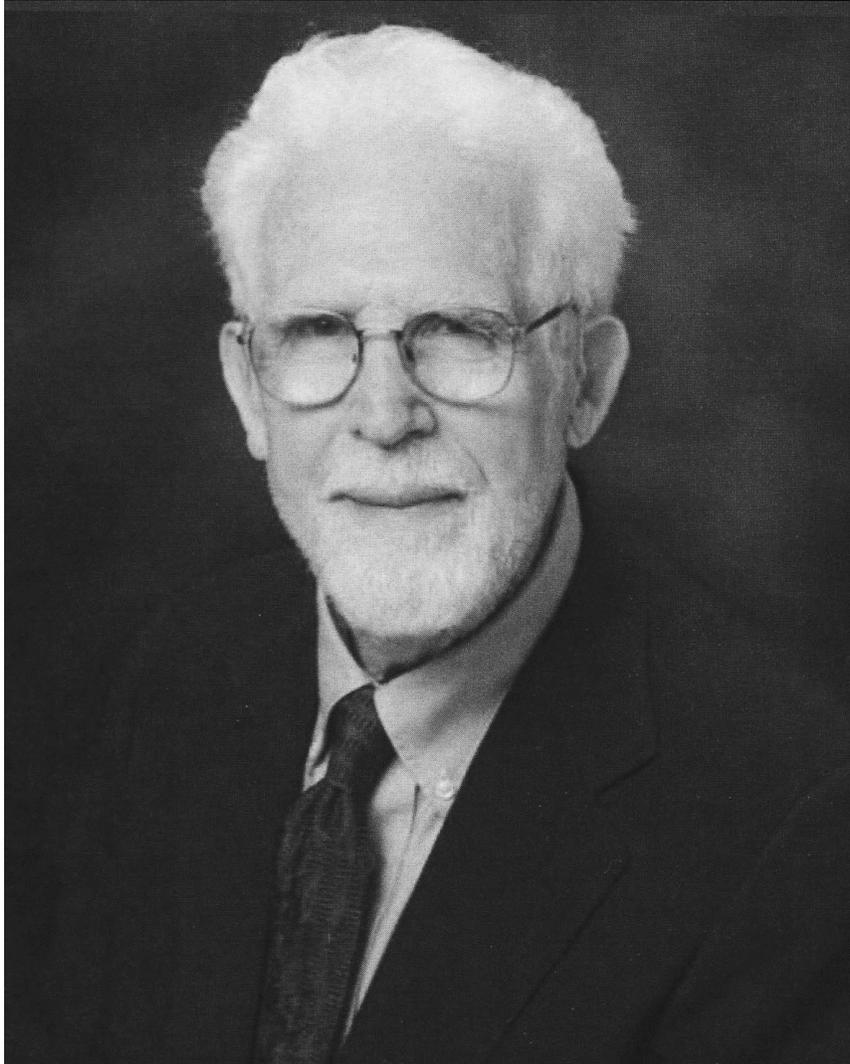
**Figure 5** John Gerard William De Brahm, *Hydrographical map of the Atlantic Ocean, extending from the southermost part of North America to Europe. Shewing the differt. variations of the compass, the setting and changes of the currents in the ocean, as well caused by the Florida commonly called Gulf Stream, than those coming from Baffins Bay and Hudsons Straits, especially the true distance from Europe to America, ascertained by a late hydrometrical operation, the table of which is joyn'd in print to the satisfaction of competent judges. Perform'd by William Gerard de Brahm. P. Andrews sculp* (London, 1771). Library of Congress. G9112.G8 1771 .D4 Vault

**Figure 6** John Gerard William De Brahm, *The levelling balance and counter-balance, or, The method of observing, by the weight and height of mercury on any place of terra-firma on the terrestrial globe, the exact weight and altitude of the atmosphere below and above the place of observation : thereby to ascertain how much the horizon of the sea is lower than the place whereon the observation is made* (London: T. Spilsbury, 1774). Illustration from title page. Library of Congress. QC895 .D28 Jefferson Exhibit Coll fol

**Figure 7** National Oceanic and Atmospheric Administration, *Highly detailed satellite image of the Gulf Stream*. Infrared image from the Suomi NPP satellite on April 16, 2013, centered around 180 miles due east of Atlantic City, NJ. Courtesy of NASA/NOAA. <http://www.nnvl.noaa.gov/MediaDetail2.php?MediaID=1328&MediaTypeID=1>

**Figure 8** The author, Louis De Vorsey.

**Back cover** De Brahm's "Chart of Cape Florida according to the Surveys May 13 & 29 , 1765."



**Louis De Vorsey (1929-2012)**

### Other Works on De Brahm by the Author

- “William Gerard De Brahm, eccentric genius of southeastern geography,” *The Southeastern Geographer* (University of North Carolina Press, 1970). Vol. 10., No. 1, 21–29.
- “Pioneer charting of the Gulf Stream: The contributions of Benjamin Franklin and William Gerard De Brahm,” *Imago Mundi* (London: Routledge, 1986). Vol. 27, 105–120.
- “William Gerard De Brahm,” *Geographers Biobibliographical Studies*, (Continuum Ltd., 1986). Vol. 28. No. 10, 41–47.
- “William De Brahm, the South’s first geographer,” *The role of the South in the making of American geography: Centennial of the Association of American Geographers*, (Columbia, MD: Bellwether Publishing, Ltd., 2004), 307–317.

As editor:

- William Gerard De Brahm, *De Brahm’s report of the general survey in the southern district of North America* (Columbia: University of South Carolina Press, 1971).
- William Gerard De Brahm, *The Atlantic Pilot: A Facsimile Reproduction of the 1172 Edition* (Gainesville, University Presses of Florida, 1974).





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MAPS



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The 12<sup>m</sup> Section from Latitudes 25, 00. 00. to 26, 00. 00. & 80 in Longitude, drawn from the Surveys made May 12 & 26, 1765, represents the Course of Charco Largo & Medio, both fresh Waters, & also the head of Cape River & all those Rivers are supplied with water from the Situation in fresh water marshes, containing 37061 acres good Live Land, & are interspersed with some Live oak knolls of good plantable corn & indigo land, holding together with what Land is plantable on the Sea coast; 5400 acres; the Sandy & im plantable Land on the Sea Coast contains 6000 acres, so that the whole, what can be ascertained between main & Sea is presented in this Section amounts to 43061 acres; the plantable Land on the main commonly covered with Live oak, Hickory & mulberry, lies in spots; the remainder in pine land of the best kind producing Smooth bark yellow pine; the very choice for Timber.

P. Middle Inlet is hard up; has only 8 foot water in common, & at Spring Tides high water four foot; affords a good harbour for small crafts in middle River up to the Island. The Florida Stream runs at two miles distance of the Coast due North & its Eddy in this due South upon Sandy Point. Rings interspersed with rocks & spearf, (called yellow loom) Shoals, which Soundings in Latitude 25, 00, 00 are only on sandy & rocky; & more northerly on Gravelly Sandstones. as the Climate is mild the marsh land may do either for rice, Indigo or Sugar cane; the High land for Cotton, hemp, corn, & also Indigo.

P. the best method of disposing of these parts will be to Survey them in large Trade Sows from the Sea coast West into the main & others behind them from the main to the large Rivers which lies to the Westward.

Chart of Middle Inlet  
By W. Bledsoe



Chart of Cape Florida  
according to the Surveys made May 12 & 29, 1765. By W. Bledsoe

The 15<sup>m</sup> Section containing Cape Florida, with part of Bahama Channel & Cape River with its Environs: this Cape lies precisely in North Latitude 25, 25, 00. with 8, 12, 12 West Variation of the magnetic fluid from the true meridian, & in 7, 00, 00 East Longitude from the true Meridian, has its name common with the Florida, vulgarly called Gulf, a Stream, is bounded by the Trade Winds round & out of the Gulf of Mexico a long the Southern, Western & Eastern Coast of Florida formerly extending to Virginia & had been the Southern Cape of the East Indies Province according to Charles Boyle & many other Navigators, and is now of whole Eastern Shore of the South Division of North America the very Cape from whence the main alters its course from South to West & forms the North Cape of the promontory, opposite to which lies a number of Shoals or keys between ten & fifteen miles off the main. All the Boats coming from Cuba or other may make this Cape in order to take from thence their departure through the Bahama Channel to the Northward, as two Islands did, which appear at the time of the Survey vizt may 10 & 23 may 29 approaching within four & five miles to this Cape, which by many appearances, especially that of the Shoals, in my Survey, between it & the Sea Coast seems to have been detached by force of the winds, but is left with out a Channel or probably for ever, on account of the weakness of the rocks, the one from the East through the Cape Key & Middle Key from the Westward through the Entrance of Cape River, which being a short Cut to the River, having become three two, & three one called Middle Inlet, which accords, that the Flood Tides are generally longer & stronger, than the Ebb Tides.

Two having by which is how before shown & its right of water divided by these different outlets, can gather no might sufficient to pierce through the Channel by the Florida Stream, by which the Sea branches from the River to the Cape, from thence it is a few miles off the Coast of Florida, this no round of Cape to the main, however it is not impetuous, at Chazy times, a Channel may be forced out through Middle Inlet by the right of water gathering in the marshes at the head of Cape River. Any Craft, that does not abate three foot, may not without sufficient depth of water, both at the River Entrance of the Cape Key & Middle Inlet, for four foot draught. The Cape of Sea Coast to the Entrance of the River consists of Swamp of the Land, the latter not exceeding 2000 acres to a course which sand containing much moisture, the principal plants are the pear granado, the arbutus grapes & the Iron-plantain, the opposite, opposite here, is a variety of unground Shrubs, & as in this region a plantation distinguished from the Swamp plantain, grows on a bottom shaded with small parallel Strips of which the Oil is so rich, as being it self producing mangrove but seen 20 & 30 foot high, of whose inner crimson bark is said the Spaniards make their red cedarwood; I this main on the West of Cape River, shows quantity of acres (for want of firmness in ground) not as yet ascertained appears to be all high land, represented the same, as that on the Sea coast, is chiefly covered with cedar, oak, mulberry & gum in all. 25, 00. at the main upon a due West line is a mile a Crop of three appears a River four miles over, which comes either from James Bay, or is the continuation of the Middle Inlet River which in Latitude 25, 00, 00, the Sea is a small open departure, no fish in the middle waters toward the Cape, at least there was none May 12 & 29, nor is any other animal or vegetable, except two Bears, a kind of only one Bear was observed. no signs of any ordinary winter effect is to be seen, nor any Shrub or Tree species of those in Northern Climate, nor is any indurification in the Vegetation, of which I had full proof pear granado, whose Trees are full of blossom, but the leaves are full ripe shrubs, the heat would be intolerable, if the Trade Winds did not afford an agreeable temperature of air. A thick amber Oil on this Shore in great quantity.



A by trees on a white bottom, whilst the latter, which amounts to 11782 acres is represented by trees. B the Cape lies in Longitude from 27 Augustines 1, 26, 50. 63752. CG SVAR. D4 Vault (214)