No. 142, Original

In The

Supreme Court of the United States

STATE OF FLORIDA,

Plaintiff,

v.

STATE OF GEORGIA,

Defendant.

OFFICE OF THE SPECIAL MASTER

REPORT OF THE SPECIAL MASTER
February 14, 2017

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I. INTRODUCTION

This original jurisdiction proceeding arises from a dispute between the States of Florida and Georgia regarding Georgia's use of water in the Apalachicola-Chattahoochee-Flint River Basin (the "Basin"), which encompasses parts of Georgia, Alabama, and Florida. In its Complaint, Florida alleges that it has suffered serious harm to its ecology and economy – particularly in Apalachicola Bay (the "Bay") – because of reduced flows in the Apalachicola River (the "River") resulting from Georgia's increasing consumption of water from the Basin. Florida therefore seeks an equitable apportionment of the waters of the Basin.

This action is the latest battle in a long-running war between the State of Florida and the State of Georgia over the use of the waters of the Basin. Florida has long maintained that it is entitled to streamflow in the River adequate to sustain the riverine and estuarine ecosystems in the River and the Bay (collectively, the "Apalachicola Region") as well as the livelihood of those, like the oystermen of the Bay, who make their living from these ecosystems. Georgia, for its part, has insisted that it be permitted to consume sufficient water from the Basin to meet the municipal and industrial water demands of the Atlanta metropolitan area as well as the agricultural irrigation demands of farmers in southeastern Georgia. Decades of on-again-off-again negotiations and litigation over the use of the waters of the Basin have, unfortunately, led to this original jurisdiction proceeding rather than to a

mutually-acceptable solution negotiated by the States on behalf of all of the affected stakeholders in the Basin – oystermen, farmers, and businesses alike.

In this proceeding, Florida seeks a remedy for what it asserts is Georgia's excessive consumptive use of water[1] from the Basin. According to Florida, Georgia's consumption of water has reduced the flows in the River to an extent that is destroying the ecology of both the River and the Bay, as well as the economy of the Apalachicola Region. Georgia, in turn, argues that Florida's asserted harms are imaginary, self-inflicted, or inflicted by the operations of the United States Army Corps of Engineers (the "Corps") or changes in precipitation patterns (or some combination thereof) but in any event cannot be traced to Georgia's water use. Georgia also maintains that, without an order binding the Corps, Florida will not be assured any relief – assuming it has suffered any injury at all – by a decree entered in this proceeding because the Corps has the ability to impound water in various reservoirs that it maintains in the Basin. Both States warn of dire consequences if the Court does not resolve this

[1] Throughout this Report, I employ the term "consumptive use" to refer to water withdrawn from surface water or underground aquifers that is evaporated, transpired, incorporated into products or crops, consumed by humans or livestock, or otherwise removed from the environment. Not all water withdrawals count as "consumptive use," given that some water withdrawn for use will return to streamflow or aquifers.

proceeding in their favor – Florida of an ecological and economic disaster in the Apalachicola Region; Georgia of a crippled city and arid farmland in Georgia.

The Court appointed me Special Master with direction to, among other things, direct the course of proceedings and submit reports as appropriate to resolve the dispute between the two States. After overseeing motions practice and discovery, holding a lengthy evidentiary hearing, and receiving detailed pre- and post-trial briefing, I hereby submit this Report to the Court. The Report identifies the issues before the Court, discusses the States' contentions, describes the evidence and law pertinent to the resolution of those issues, and sets forth a recommendation.

In sum, the Report recommends that the Court deny Florida's request for relief because the Corps is not a party to this original jurisdiction proceeding. Because the Corps is not a party, no decree entered by this Court can mandate any change in the Corps' operations in the Basin. Without the ability to bind the Corps, I am not persuaded that the Court can assure Florida the relief it seeks. I conclude that Florida has not proven by clear and convincing evidence that its injury can be redressed by an order equitably apportioning the waters of the Basin.

II. BACKGROUND[2]

A. The Basin and Bay

Three rivers comprise the Basin.[3] The Chattahoochee River arises in northeastern Georgia and flows over 430 miles south, forming part of the border between Georgia and Alabama, to its confluence with the Flint River at Lake Seminole and the Georgia-Florida state line. (JX124, at 2-15; Hornberger Direct,[4] at ¶ 30).

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[2] Citations to "JX__," "FX__," and "GX__" throughout this Report are, respectively, citations to exhibits admitted into evidence upon proffer by Florida and Georgia jointly, Florida, or Georgia. Page references in exhibit citations refer to the internal pagination of the cited documents, except when it is more helpful to use the Bates numbers assigned by the parties. (In such cases, I exclude the series of zeroes at the beginning of most page numbers to preserve space.) The exhibits themselves are maintained in the Special Master's file. Citations to "[Witness] Direct, at __" are citations to direct testimony submitted in writing. The written direct testimony is included on the Special Master's docket at entries 533-74. Citations to "Tr." are citations to the transcript of the evidentiary hearing in this matter, held from October 31, 2016 through December 1, 2016. The transcript, in 17 volumes, is included on the docket at entries 612-28. The Special Master's docket and electronic copies of all public filings included therein are accessible on the internet at http://www.pierceatwood.com/floridavgeorgia142original. A hard copy of the docket sheet itself, as of January 27, 2017, is attached to this report as Appendix A. Citations to "Dkt. No. __" are citations to filings included in the docket.

[3] A map of the Basin is included with this Report as Appendix B.

[4] Dr. Hornberger, an expert hydrologist testifying on behalf of Florida, is a Professor of Civil and Environmental Engineering and Earth and Environmental Sciences at Vanderbilt University. He has a Ph.D. in hydrology from Stanford University, and is

Georgia withdraws substantial amounts of water from the Chattahoochee River for municipal and industrial water supply in the Atlanta metropolitan area. (Mayer Direct,[5] at ¶¶ 21, 24-25, 35; Zeng Direct,[6] at ¶¶ 18, 30-32). The Flint River, a significant source of irrigation water in southern Georgia, arises in the metropolitan Atlanta area and flows about 350 miles southward to join the Chattahoochee River at Lake Seminole. (JX124, at 2-17; Hornberger Direct, at ¶¶ 31, 77; Zeng Direct, at ¶¶ 18, 63). Downstream of Lake Seminole, the Apalachicola River flows south across Florida's panhandle and feeds into the Apalachicola Bay at the Gulf of Mexico. (JX124, at 2-22). The Basin drains over 19,500 square miles in parts of Georgia, Alabama, and Florida. (*Id.* at ES-1).

Both the Chattahoochee River and the Flint River are affected, though to differing degrees, by dams operated by the Corps, as well as eleven non-federal

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the lead author of a hydrology textbook. (Hornberger Direct, at ¶¶ 4-9).

[5] Mr. Mayer, Georgia's expert in civil engineering and municipal and industrial water use, is a civil engineer and licensed Professional Engineer who provides expert analysis and consulting services to municipalities and public water systems regarding water conservation, drought response, and municipal and industrial water use, among other things. Mr. Mayer has over twenty years of experience analyzing urban water systems and demand management. (Mayer Direct, at ¶¶ 12-19).

[6] Dr. Zeng is Georgia's chief hydrologist, having served as the program manager of the Hydrological Analysis Unit of Georgia's Environmental Protection Division for the past ten years. He holds a Ph.D. in hydrology and water resources. (Zeng Direct, at ¶¶ 2-4, 9-14).

dams.[7] For most of its length, the Chattahoochee River is controlled by the Corps' dams. (JX124, at 2-15). The Corps operates five dams and four reservoirs on the Chattahoochee River (in downstream order): Lake Sidney Lanier and Buford Dam; West Point Lake and Dam; Walter F. George Lake and Dam; George W. Andrews Dam; and Lake Seminole and Jim Woodruff Dam. (*Id.* at 2-23, 2-26 – 2-46; GX544, at 4-9). The Flint River flows unimpeded by any dams operated by the Corps above Lake Seminole, flowing only through Jim Woodruff Dam before joining the Apalachicola River. (JX124, at 2-17). Three of the Corps' dams include significant reservoir storage, while the two dams furthest downstream, the George W. Andrews Dam and the Jim Woodruff Dam, are "run-of-river" projects (*i.e.*, they do not have appreciable storage to support project purposes). (*Id.* at 2-26 – 2-46; GX544, at 4-9). The Corps is supposed to operate these dams as a unified whole to achieve multiple objectives, including navigation, hydroelectric power generation, national defense, recreation, and industrial and municipal water supply. (JX124, at ES-1, 2-58 – 2-61; GX544, at 4-5, 17-18).[8] The Corps is also supposed to operate its system of dams and reservoirs in a manner that complies with various other federal statutory objectives, such as

[7] A map of the dams in the Basin is included with this Report as Appendix C.

[8] *See* H.R. Doc. No. 342, 76th Cong., 1st Sess. 77 (1939); River and Harbor Act of 1945, Pub. L. No. 79-14, § 2, 59 Stat. 10, 17 (1945); River and Harbor Act of 1946, Pub. L. No. 79-525, § 1, 60 Stat. 634, 635 (1946); Flood Control Act of 1962, Pub. L. No. 87-874, § 203, 76 Stat. 1173, 1182 (1962).

conservation of fish and wildlife, water quality, and protection of threatened or endangered fish and wildlife. (JX124, at ES-1, 2-58 – 2-61; GX544, at 4-5).[9] Like George W. Andrews Dam and Jim Woodruff Dam, the non-federal dams along the Chattahoochee River and Flint River are "run-of-river" projects and do not permit significant storage. (GX544, at 9-12).

The Apalachicola River, which is unimpeded by any dams, flows southward from the Jim Woodruff Dam for approximately 106 miles before emptying into Apalachicola Bay.[10] (JX124, at 2-22; Steverson Direct,[11] at ¶ 12; Hoehn Direct,[12] at ¶ 15). The River is typically divided into four "reaches" from north to south – the Upper Reach, the Middle Reach, the Lower Reach, and the Tidal Reach – and is characterized by not only a traditional river channel but also a floodplain of up to five miles in width. Generally speaking, the River and its floodplain are narrower in the upper reaches and

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[9] *See, e.g.*, Endangered Species Act, 16 U.S.C. § 1531 *et seq.*; Flood Control Act of 1944, 16 U.S.C. § 560d; Water Supply Act of 1958, 43 U.S.C. § 390b.

[10] A map of the Apalachicola River is included with this Report as Appendix D.

[11] Mr. Steverson served as the Secretary of the Florida Department of Environmental Protection beginning in December 2014. Mr. Steverson was previously the Executive Director of the Northwest Florida Water Management District, which includes the Basin. (Steverson Direct, at ¶¶ 1, 5-6).

[12] Mr. Hoehn is a senior biologist for the Florida Fish and Wildlife Conservation Commission. He is responsible for assisting in the development of plans to maintain and restore wildlife habitats in the Basin. (Hoehn Direct, at ¶¶ 7, 9).

wider in the lower reaches, and the floodplain is criss-crossed by tributaries, sloughs, and swamps. Sloughs are natural channels cut through the river levee that are fed by the River (when connected by adequate streamflow). These sloughs often meander through the floodplain forests and swamps only to return to the River in a loop pattern. (Hoehn Direct, at ¶¶ 11, 17-26). The River, along with its associated floodplain and network of sloughs, sustains a unique ecosystem. (*Id.* at ¶¶ 29-36; Steverson Direct, at ¶¶ 9-10). This ecosystem is home to the highest species density of amphibians and reptiles in all of North America, and supports hundreds of endangered or threatened animal and plant species. (Steverson Direct, at ¶¶ 9-10). The River and its floodplain host numerous freshwater mussel species, including three federally-listed mussels (the endangered fat threeridge, threatened purple bankclimber, and threatened Chipola slabshell) that live in or along the side channels and sloughs of the River. (Hoehn Direct, at ¶ 31). Threatened Gulf sturgeon make their home in the River, and the upper Tidal Reach is home to Tupelo swamps. (*Id.* at ¶¶ 22, 32).

Discharge from the Basin into the Apalachicola River supports another unique ecosystem – Apalachicola Bay.[13] The Bay, a wide, shallow estuary along the Gulf Coast, is one of the largest estuaries in the southeastern United States and is one of the most productive estuaries in the northern hemisphere. It is a major fishery resource for oysters, shrimp, and finfish.

[13] A map of Apalachicola Bay is included with this Report as Appendix E.

(JX124, at 2-22, 2-56 – 2-57, 2-204 – 2-205). The Bay is an "ideal" place for oysters to thrive, given its characteristics. (Ward Direct,[14] at ¶ 11). Flow from the River into the Bay helps maintain lower salinity in the Bay, a necessary condition for the Bay's oyster population, and provides essential nutrients to the Bay as well. (Berrigan Direct,[15] at ¶¶ 38-39). River flow is the primary determinant of salinity in the Bay. (JX124, at 2-56, 2-206). The Bay has historically been an extraordinarily productive oyster habitat, producing ninety percent of Florida's oyster harvest and ten percent of the nation's oyster harvest. (Steverson Direct, at ¶¶ 10, 26). Apalachicola oysters are widely recognized for their quality and have significant commercial harvest value. (Kimbro Direct,[16] at ¶¶ 16-17; Ward Direct, at ¶¶ 10-11). Given the historic productivity of the Bay and the prohibition on mechanical harvesting of oysters, the Bay supports a distinctive culture and fishery built around the harvesting of oysters by hand from

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[14] Mr. Ward, a fact witness for Florida, is a third-generation oyster dealer in Apalachicola, Florida. He holds the largest private oyster leases in the Bay, and is the former President of the Apalachicola Bay Oyster Dealers Association. (Ward Direct, at ¶¶ 1-3, 13-19).

[15] Mr. Berrigan is a former senior biologist at the Florida Department of Natural Resources, and was the primary oyster biologist for the State of Florida for thirty years. (Berrigan Direct, at ¶¶ 8-11).

[16] Dr. Kimbro, Florida's expert in ecology, is an Assistant Professor in the Department of Marine and Environmental Sciences at Northeastern University. Dr. Kimbro holds a Ph.D. in Ecology from the University of California at Davis. (Kimbro Direct, at ¶¶ 9-10).

small boats. (Steverson Direct, at ¶¶ 27-28; Ward Direct, at ¶¶ 12-18). The harvesting and sale of shrimp, crab, fish, and oysters is the primary economy in the Apalachicola Region. (JX124, at 2-205). Reflecting the importance and unique characteristics of the Bay, nearly 235,000 acres of public lands and water encompassing the Bay and the lower portion of the River have been set aside as the Apalachicola National Estuarine Research Reserve. (Steverson Direct, at ¶¶ 24-25; JX124, at 2-57).

B. Prior Proceedings

Florida and Georgia, as well as Alabama and the Corps, have been engaged in a decades-long dispute over the use and management of the waters of the Basin. From 1990 through 2012, Georgia, Florida, Alabama, and the Corps were involved in extensive multi-state and multi-district litigation relating to the Basin that ultimately culminated in two decisions by United States courts of appeals. A much simplified summary follows.

Litigation began in 1990, when Alabama filed a lawsuit against the Corps to prevent the Corps from reallocating storage in the Basin for municipal and industrial water supply in Georgia. (JX124, at 3-6 – 3-7). Alabama and the Corps jointly agreed to stay that proceeding and to seek to resolve the dispute through negotiations among Alabama, Georgia, Florida, and the

Corps. (Struhs Direct,[17] at ¶ 9). In 1992, these parties entered a Memorandum of Agreement ("MOA") specifying that a comprehensive study of the water resources in the Basin would be conducted in partnership among the States and the Corps. (JX124, at 3-6; GX544, at 13). The MOA also contained a "live and let live" provision permitting existing water users to reasonably increase water withdrawals for the period necessary to negotiate a solution to the water issues, but did not grant any vested right to such water use. (JX4).

In 1997, after five years of the parties' comprehensive study, the States and the federal government entered into the Apalachicola-Chattahoochee-Flint River Basin Compact, Pub. L. No. 105-104, 111 Stat. 2219 (1997) (the "Compact"). (JX124, at 3-6). Unlike most interstate compacts, the Compact did not lay out a formula for allocating the waters of the Basin; instead it set out a process for negotiations over such a formula to be completed by a set deadline. (FX209). Article I provided:

> This Compact among the States of Alabama, Florida and Georgia and the United States of America has been entered into for the purposes of promoting interstate comity, removing causes of present and future controversies, equitably apportioning the surface

[17] Mr. Struhs was the Secretary of the Florida Department of Environmental Protection from 1999 to 2004, and acted as Florida's representative during interstate negotiations over the water of the Basin. (Struhs Direct, at ¶ 2).

> waters of the ACF, engaging in water planning, and developing and sharing common data bases.

(*Id.*) The Compact also included a "live and let live" provision like the one included in the MOA. (*Id.*) Lengthy negotiations followed, and the deadline was extended by agreement on numerous occasions. Ultimately, however, the negotiations collapsed and the Compact expired in August 2003. (JX124, at 3-6 – 3-7; GX544, at 14; Struhs Direct, at ¶ 16).[18] The war continued.

In 2000, while Compact negotiations were still ongoing, Southeastern Federal Power Customers, Inc. ("SeFPC") sued the Corps, alleging that the use of water from Lake Lanier for water supply purposes was not authorized. (JX124, at 3-8; GX544, at 14-15). After mediation in which Georgia joined, the Corps entered a Settlement Agreement that required the Corps to enter into long-term contracts for water supply. (JX124, at 3-8; GX544, at 15; Reheis Direct,[19] at ¶ 69; Struhs

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[18] The circumstances surrounding the collapse of the States' negotiations were the subject of extensive testimony and controversy at trial. Rehashing this evidence is unnecessary; it suffices to say that Florida and Georgia trade mutual accusations and recriminations over the cessation of negotiations. Regardless of which State is responsible for the Compact's expiration, it is apparent that both States have allowed acrimony and accusations of bad faith to permanently poison their approach to management of the waters of the Basin.

[19] Mr. Reheis served as Director of the Environmental Protection Division of Georgia's Department of Natural Resources from 1991 until July 2003. (Reheis Direct, ¶¶ 1, 6).

Direct, at ¶ 39). In 2008, the United States Court of Appeals for the D.C. Circuit ultimately held that the Settlement Agreement was invalid as exceeding the Corps' authority. *Se. Fed. Power Customers, Inc. v. Geren*, 514 F.3d 1316, 1325 (D.C. Cir. 2008).

In the meantime, several suits relating to the operations of the Corps in the Basin – including the original lawsuit filed by Alabama against the Corps as well as other lawsuits filed by Florida and Georgia – were transferred to the United States District Court for the Middle District of Florida in 2007 as MDL 1824. (JX124, at 3-9 – 3-10). In 2008, the case involving the SeFPC and the Corps was also transferred to MDL 1824 after remand from the D.C. Circuit. (GX544, at 15-16). After several years of litigation, the United States Court of Appeals for the Eleventh Circuit held that the Corps had the authority to allocate substantial quantities of storage in Lake Lanier for purposes of water supply for the Atlanta metropolitan area. *In re MDL-1924 Tri-State Water Rights Litig.*, 644 F.3d 1160, 1205 (11th Cir. 2011).

With the resolution of the cases involving the Corps' authority and operations in the Basin, the Corps subsequently undertook efforts to issue a new manual governing its operations in the Basin. (GX544, at 1, 17). Florida then brought this suit, invoking the Court's original jurisdiction to equitably apportion the waters of the Basin.

III. PLEADINGS

Florida filed its Motion for Leave to File a Complaint, Complaint, and Brief in Support of Motion on October 1, 2013. In the Complaint for Equitable Apportionment and Injunctive Relief accompanying its motion and subsequently entered on the Special Master's docket on November 3, 2014, Florida alleges that it has suffered serious harm to its ecology and economy because of reduced flows in the River resulting from Georgia's increasing consumption of water from the Basin for municipal, industrial, and agricultural uses. (Complaint at ¶¶ 5-7, 21, 42-43, 57-58, *Florida v. Georgia*, No. 142 Orig. (Nov. 3, 2014) (Dkt. No. 1) (hereinafter "Complaint" or "Compl.")).

Specifically, Florida alleges that "[m]aintaining an ample flow of water from the Chattahoochee and Flint River Basins is critical to preserving the ecology of the Apalachicola Region." (Compl. at ¶ 24). According to Florida, the Apalachicola River supports a significant floodplain forest as well as a large number of freshwater fish, mussel, and plant species. (*Id.* ¶¶ 25-26). Florida further alleges that the Apalachicola Bay "has been historically one of the most productive estuarine systems on the Gulf Coast" (*id.* ¶ 27), and that the "environmental health of the Apalachicola Region directly affects the local economy and sociology," which is "highly dependent on the region's natural resources" (*id.* ¶ 30).

Florida alleges the following regarding changes in the Basin caused by Georgia's consumptive water use.

First, "Georgia's water storage and consumption upstream of the Apalachicola River in the Chattahoochee and Flint River Basins has reduced Apalachicola River flows entering Florida." (Compl. at ¶ 42). According to Florida, Georgia's municipal and industrial water use in the Chattahoochee River Basin, agricultural water use in the Flint River Basin, and evaporative losses from non-federal water impoundments are the cause of the reduced flows in the River. (*Id.* ¶¶ 44-49). Second, Georgia's water consumption has "diminished the amount of water entering Florida in spring and summer of drought years by as much as 3,000-4,000 cubic feet per second" ("cfs"), and that, in recent drought conditions, the average flow in the Apalachicola River has been less than 5,500 cfs from May through December, conditions "unprecedented before 2000." (*Id.* ¶ 50). Third, the effect of Georgia's water use is particularly evident during low-flow periods. (*Id.* ¶ 21).

Florida alleges that these "exceptionally low" flows have been "extremely harmful" to the Apalachicola Region. (Compl. at ¶ 55). Specifically, Florida claims that low flows are "damag[ing] numerous species and habitats in the Apalachicola Region's ecosystem, and the overall economic, environmental, and social health and viability of the region" (*id.* ¶ 42; *see id.* ¶¶ 6-7, 43, 54); that the reduced flows have increased salinity levels in the Bay, resulting in a collapse in Florida's oyster industry (*id.* ¶ 56); that low flows have harmed threatened mussel species and Gulf sturgeon in the River (*id.* ¶ 58); and that "[a]s Georgia's water uses grow, the

amount of water entering Florida will continue to decrease, essential fish and wildlife habitats will constrict, and Florida will suffer additional irreparable harm" (*id.* ¶ 59).

As a remedy, Florida requests that the Court "enter a decree equitably apportioning the waters of the ACF Basin." (Compl., Prayer for Relief). In its Complaint, Florida asks the Court to "cap[ ] Georgia's overall depletive water uses at the level then existing on January 3, 1992," as well as "any other relief that the Court may deem just and appropriate." (*Id.*).

Georgia opposed Florida's motion for leave to file its Complaint, contending that Florida's claims were of insufficient significance to warrant further proceedings before the Court. Georgia also contended that, to the extent Florida has suffered harm, any harm resulted from the activities of the Corps and cannot be remedied except by alterations in the operations of the Corps' dams and reservoirs on the Chattahoochee River. (*See* State of Georgia's Opposition to Florida's Motion for Leave to File a Complaint, *Florida v. Georgia*, No. 142 Orig. (Jan. 31, 2014)).

By order dated November 3, 2014, the Court granted Florida's motion for leave to file. *Florida v. Georgia*, 135 S. Ct. 471 (2014). The Court subsequently appointed me "to fix the time and conditions for the filing of additional pleadings, to direct subsequent proceedings, to summon witnesses, to issue subpoenas, and to take such evidence as may be introduced and

such as he may deem it necessary to call for." *Florida v. Georgia*, 135 S. Ct. 701 (2014).

IV. COURSE OF PROCEEDINGS BEFORE THE SPECIAL MASTER

The proceedings before me commenced with an initial telephone conference with counsel for the parties and the United States[20] on December 1, 2014 and concluded with an evidentiary hearing held from October 31, 2016 through December 1, 2016, followed by post-trial briefing that was completed by December 29, 2016. The conduct of discovery, the filing and resolution of motions, and the conduct of evidentiary hearings proceeded in accordance with a series of Case Management Orders ("CMOs") and a Case Management Plan ("CMP"), as reflected on the docket.

Florida submitted its Complaint on November 3, 2014, and Georgia filed its Answer on January 8, 2015. (*See* Compl. (Nov. 3, 2014) (Dkt. No. 1); Answer (Jan. 8, 2015) (Dkt. No. 15)). I permitted Georgia to file a motion to dismiss Florida's Complaint based on Fed. R. Civ. P. 12(b)(7) by February 16, 2015. (*See* CMO No. 3 (Jan. 30, 2015) (Dkt. No. 23)). Georgia timely filed its motion to dismiss Florida's Complaint for failure to join the United States as a required party under Fed. R. Civ. P. 19. Thereafter, I also directed the parties to brief the issue of whether Alabama was a required party under Rule 19 and permitted both the United

[20] The United States has participated only as *amicus curiae* and did not actively participate during discovery or trial.

States and Alabama to submit *amicus* briefs. (*See* CMO No. 5 (Feb. 23, 2015) (Dkt. No. 52); CMO No. 7, ¶ 2 (Apr. 8, 2015) (Dkt. No. 99)). The parties fully briefed these issues, and both the United States and Alabama submitted *amicus* briefs. I held a hearing on the motion on June 2, 2015. Subsequently, on June 19, 2015, I issued an order denying Georgia's motion and concluding that, on the record as it then stood, Georgia had not carried its burden of proof under Rule 19. I also concluded that Alabama need not be joined under Rule 19. (*See* Order on State of Georgia's Motion to Dismiss for Failure to Join a Required Party (June 19, 2015) (Dkt. No. 128)).

Specifically, in that Order I found as follows. I concluded that Georgia, as the moving party, bore the burden to show: (1) that the nature of the interest possessed by the United States, as the absent party, meant that the United States should be joined if feasible; and (2) if the United States should but could not be joined, that the United States or the parties would be so prejudiced by continuance of the action as to justify dismissal. (*See* Order on Motion to Dismiss, at 7). I further concluded that the factual allegations of the Complaint must be presumed true and that all reasonable inferences had to be drawn in favor of the non-moving party. (*Id.*). Applying this standard of review, I found that the United States should (but could not) be joined because there was a "real possibility that a judgment might impede the United States' ability to protect its interest in managing the flow of water in the Chattahoochee River," given that the Corps operates dams

and reservoirs along that river and, in so doing, must comply with various statutory objectives and mandates. (*Id.* at 9 (quotation marks and alterations omitted); *see id.* at 11). However, I also found that Georgia failed to prove that the action could not proceed in equity and good conscience. (*Id.* at 11). Accepting the facts as pled in the Complaint and drawing all reasonable inferences in favor of Florida, I concluded that it might be possible to shape a remedy that would afford Florida adequate relief absent the United States as a party by entering an order capping Georgia's consumption of water. (*Id.* at 12). I found it "plausible" that increased streamflow in the Chattahoochee River resulting from a cap would increase the amount of water in the Apalachicola River without a change in the Corps' operations because: (1) under its general operational protocols, the Corps could match increased inflows into Lake Seminole with increased releases from the Jim Woodruff Dam into the Apalachicola River; and (2) a reduction in Georgia's consumption would render periods of reduced flow under the Corps' drought operations fewer and further between. (*Id.* at 14-16). I observed that Georgia had failed to provide any evidence rebutting these reasonable inferences, and I therefore had to "assume" that these inferences were true. (*Id.* at 13, 15-16). I also observed, however, that at trial Florida would have to carry the burden of proof on this point. (*Id.* at 16 & n.6). I then went on to conclude that entry of a decree capping Georgia's consumption would not prejudice the rights of the United States or the parties, and that Florida would have no other adequate remedy if this original jurisdiction

proceeding were dismissed at the pleading stage. (*Id.* at 16-21). In short, I observed that, "at least as far as the record has so far been developed, the [United States is] not proven to be indispensable whereby the cause has to be dismissed." (*Id.* at 22 (quoting *Francis Oil & Gas, Inc. v. Exxon Corp.*, 661 F.2d 873, 879 (10th Cir. 1981))). I also concluded that the case should not be dismissed for failure to join Alabama as a party because Alabama was not a required party and was not at risk of prejudice. (*Id.* at 22-24).

Beginning before and continuing during and after the pendency of Georgia's motion, the parties conducted written discovery and depositions. Discovery proceeded in accord with a version of the Federal Rules of Civil Procedure modified to best fit this particular action. (*See* CMP, ¶ 5 (Dec. 3, 2014) (Dkt. No. 6)). The parties engaged in extensive discovery over the course of approximately eighteen months, including fact and expert discovery. Throughout this period, I heard and resolved various discovery disputes and held regular status conferences to keep abreast of the parties' progress in discovery. Discovery closed on August 5, 2016.

Throughout the discovery process, I repeatedly urged the parties to settle. The parties did agree to mediation, and I entered a confidentiality order to "facilitate an open exchange of information between the parties" and "promote the public interest in reaching a negotiated settlement of this complex and expensive proceeding." (CMO No. 8 (Apr. 13, 2015) (Dkt. No. 101)).

The parties dutifully reported conferences with a mediator, whose identity was not disclosed, but ultimately the mediation efforts were unsuccessful.

Commencing on October 31, 2016, and concluding on December 1, 2016, I conducted an evidentiary hearing. I set out the procedure for the evidentiary hearing in a CMO issued in advance of the hearing. (*See* CMO No. 20 (July 13, 2016) (Dkt. No. 454)). The evidentiary hearing was held in the United States Bankruptcy Court located in Portland, Maine. (*See* CMO No. 21 (July 27, 2016) (Dkt. No. 458)). The presentation of testimonial evidence and exhibits was conducted as follows.

First, the parties filed the direct testimony of all witnesses, except hostile witnesses, in writing in advance of the hearing. Forty-one different witnesses, twenty-five of whom were experts, submitted over 1,800 pages of pre-filed testimony.

Second, the parties filed their exhibits, including the written reports of their testifying experts, in advance of trial. The parties submitted over 2,400 exhibits in support of their written direct testimony, consisting of tens of thousands of pages of documentary evidence and expert reports, as well as extensive datasets. The printed exhibits fill more than sixty volumes.

Third, the parties submitted in writing their objections to pre-filed testimony and exhibits. Because there was no jury, I discouraged the filing of *Daubert* motions. Simply put, it made the most sense to hear the expert testimony and determine its relevance and

persuasiveness at trial, thereby mooting any need to resolve whether it was so inadequate as to be inadmissible. The parties accordingly filed only three motions *in limine* on *Daubert* grounds. I have denied all objections, including objections raised via *Daubert* motions, on the merits to the extent I rely on any testimony in this Report. I have denied all other objections as moot.

Fourth, at the hearing, each witness was called to the stand to affirm and offer his or her pre-filed testimony. Each witness would then be tendered for cross-examination, followed by re-direct and re-cross, if desired. At the conclusion of counsel's questioning, I then asked any questions that seemed necessary and appropriate. Thirty-two witnesses presented live testimony in this manner over the course of seventeen days. By agreement, the parties also presented six witnesses via videotaped deposition testimony. Both parties had the opportunity to identify relevant deposition excerpts from each of these witnesses to be played at trial. Further, the parties agreed to allow the written testimony of two witnesses to be submitted without cross-examination. (*See* Trial Witness List (Dec. 6, 2016) (Dkt. No. 576)).[21] I informed the parties at trial that I would not consider for purposes of my Report the testimony of the remaining witnesses who presented pre-filed direct testimony but who did not appear at the hearing to adopt their testimony and be subjected to cross-examination, and I have not done so.

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[21] A copy of the Trial Witness List is attached to this report as Appendix F.

The evidentiary presentation was supplemented by briefing both before and after hearing. In advance of the hearing, the parties submitted pretrial briefs laying out the legal and factual issues that would be addressed. I also permitted various third persons seeking to participate as *amicus curiae* to submit briefs in advance of the evidentiary hearing. (*See* Order on Motions for Leave to File *Amicus* Briefs (Sept. 21, 2016) (Dkt. No. 488)). A total of eleven *amicus* briefs were submitted, including one from the State of Colorado and one from the State of Alabama. After the hearing, the parties filed extensive post-trial briefs and reply briefs. At my request, the United States also submitted a post-trial *amicus* brief "addressing specifically the issue of the Army Corps of Engineers' operations in the ACF River Basin." (*See* Correspondence to M. Gray (Dec. 9, 2016) (Dkt. No. 577)). The post-trial briefs alone totaled over 230 pages.

Cognizant that the Supreme Court has "often expressed" its "preference that, where possible, States settle their controversies by 'mutual accommodation and agreement,'" *Arizona v. California*, 373 U.S. 546, 564 (1963) (quoting *Colorado v. Kansas*, 320 U.S. 383, 392 (1943)), I issued an order after close of briefing requiring the parties "to meet and confer . . . with the services of a mediator if at all possible," in a "good faith effort to reach a framework for settlement" of this equitable apportionment proceeding. (*See* CMO No. 22 (Jan. 3, 2017) (Dkt. No. 634)). I also instructed the parties to submit, by January 26, 2017, a confidential memorandum advising me regarding their efforts. At

the appointed date, the parties submitted a memorandum with separate statements summarizing their efforts. While a review of the parties' statements would lead any independent, objective person to conclude that the parties were describing entirely different mediations, what is unfortunately clear from the parties' memorandum is that this last effort to reach an amicable resolution of this complex equitable apportionment proceeding was unsuccessful.

V. APPLICABLE EQUITABLE APPORTIONMENT STANDARD

A. Relevant Considerations

"Equitable apportionment is the doctrine of federal common law that governs disputes between states concerning their rights to use the water of an interstate stream." *Colorado v. New Mexico*, 459 U.S. 176, 183 (1982) ("*Colorado I*"). As a threshold matter, equitable apportionment is only available to a state that has suffered "real and substantial injury" as a result of proposed or actual upstream water use. *Idaho v. Oregon*, 462 U.S. 1017, 1027 (1983) ("*Idaho II*"); *see Connecticut v. Massachusetts*, 282 U.S. 660, 672 (1931). Additionally, the injury must be redressable by the Court. *Idaho v. Oregon*, 444 U.S. 380, 392 (1980) ("*Idaho I*"); *see Washington v. Oregon*, 297 U.S. 517, 523 (1936). Beyond the requirement that the downstream state suffer an injury that can be redressed by a Court decree, however, the equitable apportionment inquiry is not "formulaic." *South Carolina v. North Carolina*,

558 U.S. 256, 271 (2010); *see New Jersey v. New York*, 283 U.S. 336, 343 (1931).

Instead, "[i]t is a flexible doctrine which calls for 'the exercise of an informed judgment on a consideration of many factors' to secure a 'just and equitable' allocation." *Colorado I*, 459 U.S. at 183 (quoting *Nebraska v. Wyoming*, 325 U.S. 589, 618 (1945)); *see South Carolina*, 558 U.S. at 271; *Idaho II*, 462 U.S. at 1025. As the Court has explained, the factors relevant to equitable apportionment include

> physical and climatic conditions, the consumptive use of water in the several sections of the river, the character and rate of return flows, the extent of established uses, the availability of storage water, the practical effect of wasteful uses on downstream areas, [and] the damage to upstream areas as compared to the benefits to downstream areas if a limitation is imposed on the former.

Colorado I, 459 U.S. at 183 (quoting *Nebraska*, 325 U.S. at 618). Notably, the Court has also considered water quality and harm to wildlife and wildlife habitat – including the effect of increased salinity on oyster fisheries – in determining an equitable apportionment of water. *See New Jersey*, 283 U.S. at 345; *Nebraska v. Wyoming*, 515 U.S. 1, 12 (1995). These factors are not exhaustive; equitable apportionment requires consideration of "all . . . relevant facts." *Connecticut*, 282 U.S. at 670-71.

"The laws of the contending states concerning intrastate water disputes" are also an "important consideration governing equitable apportionment." *Colorado I*, 459 U.S. at 183. When both states share similar water law, that law "becomes the 'guiding principle' " – but not the controlling principle – "in an allocation between competing states." *Id.* at 183-84; *see Idaho II*, 462 U.S. at 1025 ("[A]pportionment is based on broad and flexible equitable concerns rather than on precise legal entitlements."); *Connecticut*, 282 U.S. at 670-71. Both Georgia and Florida are riparian states. *See, e.g.*, *Stewart v. Bridges*, 292 S.E.2d 702, 704 (Ga. 1982); *5F, LLC v. Dressing*, 142 So.3d 936, 939-40 (Fla. Dist. Ct. App. 2014). The fundamental characteristic of the riparian system is that "each riparian proprietor has an equal right to make a reasonable use of the waters of the stream, subject to the equal right of the other riparian proprietors likewise to make a reasonable use." *United States v. Willow River Power Co.*, 324 U.S. 499, 505 (1945). *See Colorado I*, 459 U.S. at 179 n.4 ("Under the riparian doctrine, recognized primarily in the eastern, midwestern and southern states, the owner of land contiguous to a watercourse is entitled to have the stream flow by or through his land undiminished in quantity and unpolluted in quality, except that any riparian proprietor may make whatever use of the water that is reasonable with respect to the needs of other appropriators."); Tarlock, *Law of Water Rights & Resources*, §§ 3:54, 3:60.[22] Accordingly, the relevant

[22] This stands in contrast to the prior appropriation doctrine, where the "relative rights of water users are ranked in order of

guiding principle in this case is that Florida, as the downstream water user, is entitled to use of the River's flow subject to reasonable upstream consumptive uses. *See New Jersey*, 283 U.S. at 342-45 (equitable apportionment case involving riparian states). *Cf. Nebraska*, 325 U.S. at 618 (resolving equitable apportionment proceeding in light of prior appropriation law).

Given the framework established in the Court's equitable apportionment jurisprudence, there are two overarching questions that are relevant to Florida's entitlement to an equitable apportionment in this case. First, has Florida, as the State seeking an equitable apportionment, sustained "real and substantial injury" as a result of unreasonable upstream water use by Georgia? *Idaho II*, 462 U.S. at 1027; *New Jersey*, 283 U.S. at 342-43, 345. Second, will a consumption cap – the proposed remedy in this case – provide equitable redress for Florida's injury? *New Jersey*, 283 U.S. at 345; *Colorado I*, 459 U.S. at 187.

B. Burden of Proof

"The function of any standard of proof is to 'instruct the factfinder concerning the degree of confidence our society thinks he should have in the correctness of factual conclusions for a particular type

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their seniority." *Colorado I*, 459 U.S. at 179 n.4. That is, right to water in a prior appropriation state is "acquired and maintained by actual use." *Id.* Right to water in a riparian state, on the other hand, "originate[s] from land ownership and remain[s] vested even if unexercised." *Id.*

of adjudication.'" *Colorado v. New Mexico*, 467 U.S. 310, 315 (1984) ("*Colorado II*") (quoting *In re Winship*, 397 U.S. 358, 370 (1970) (Harlan, J., concurring)). "By informing the factfinder in this manner, the standard of proof . . . indicates the relative importance society attaches to the ultimate decision." *Id.* at 315-16. In equitable apportionment cases between two sovereign states, the Court requires proof by "clear and convincing" evidence. *Id.* at 316. Accordingly, equitable apportionment should be allowed only if the factfinder has an "abiding conviction" that the party bearing the burden of proof has shown "that the truth of its factual contentions are [sic] 'highly probable.'" *Id.* That is, the evidence presented by the party bearing the burden of proof must "instantly tilt[] the evidentiary scales" in that party's favor. *Id.* This heightened standard "is necessary to appropriately balance the unique interests involved in water rights disputes between sovereigns." *Id. See Colorado*, 320 U.S. at 393-94 (noting the "great and serious caution with which it is necessary to approach the inquiry whether a case is proved" in a dispute between sovereigns); *Connecticut*, 282 U.S. at 669.

While the parties vigorously contest whether Florida does or does not bear the burden of proof as to every element of the equitable apportionment inquiry, my findings in this case make it unnecessary to resolve this thorny dispute.[23] Instead, I need only address the

[23] Florida argues that, once it has proven injury, the burden of proof shifts to Georgia (as the upstream State) to prove the reasonableness of its water use, while Georgia contends that the burden of proof remains on Florida (as the State seeking additional

narrow question of which party bears the burden of proving injury and redressability.

I conclude that Florida, as the aggrieved State, must prove "real and substantial" injury from Georgia's conduct by "clear and convincing evidence." *Idaho II*, 462 U.S. at 1027. This proposition is firmly established in the Court's jurisprudence. *See Colorado I*, 459 U.S. at 187 n.13; *Connecticut*, 282 U.S. at 669. In *Idaho II*, for instance, the Court observed that the burden of proof rested on Idaho, as the party claiming injury and seeking an equitable apportionment of fishery resources, to prove that Oregon had injured Idaho by overfishing the Columbia River and mismanaging the resource. *Idaho II*, 462 U.S. at 1028-29. Likewise, in *Washington*, the Court held that Washington, as the complainant, had the burden to prove that the water diverted by Oregon was "misapplied or wasted with ensuing loss to" Washington. *Washington*, 297 U.S. at 523-24. The same rule applies here.

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water by court decree) to prove not only that it has suffered injury but also that Georgia's water use is unreasonable such that a remedy would substantially outweigh any harm to Georgia. Both parties rely on *Colorado I*, which addressed the shifting of the burden of proof as between New Mexico and Colorado in an equitable apportionment proceeding involving two states that adhered to the prior appropriation doctrine. *See Colorado I*, 459 U.S. at 187 n.13. Applying the principles set out in *Colorado I* in the context of a dispute between riparian states is not an altogether straightforward exercise. However, because I find that Florida has failed to carry its burden of proof regarding an issue on which it incontrovertibly must bear the burden, I need not and do not resolve this issue.

I also conclude that Florida bears the burden to prove that the proposed remedy will provide redress for Florida's injury. As the Court observed in an earlier decision in the dispute between Idaho and Oregon, the party seeking an equitable apportionment must prove that the requested relief will justify placing limitations on another sovereign state. *Idaho I*, 444 U.S. at 392. In *Idaho I*, the Court noted that, because Idaho had narrowed its requested equitable remedy in order to avoid the need to join the United States as a party, Idaho bore the burden of proving that its alleged harm would be remedied by a decree binding only Oregon and Washington (and not the United States). *Id.* In *Washington*, the Court dismissed the claim brought by Washington because it had not proved that any additional water not consumed by Oregon would reach Washington. *See Washington*, 297 U.S. at 523. Thus, Florida must prove that any water not consumed by Georgia as the result of a decree imposing a consumption cap will reach Florida and alleviate Florida's injury.

VI. ANALYSIS

After hearing extensive testimony bearing on numerous issues and reviewing the parties' briefing, I have concluded that there is a single, discrete issue that resolves this case: even assuming that Florida has sustained injury as a result of unreasonable upstream water use by Georgia, can Florida's injury effectively be redressed by limiting Georgia's consumptive use of water from the Basin without a decree binding the

Corps? I conclude that Florida has not proven that its injury can be remedied without such a decree. The evidence does not provide sufficient certainty that an effective remedy is available without the presence of the Corps as a party in this case. I explain the rationale for this conclusion below. Before turning to that question, however, I provide the Court a brief descriptive background regarding the harm suffered by Florida and the unreasonableness of Georgia's consumptive water use.

A. Background Regarding Florida's Harm and Georgia's Water Use

The facts presented at trial demonstrate the gravity of the dispute between Florida and Georgia. As the evidentiary hearing made clear, Florida points to real harm and, at the very least, likely misuse of resources by Georgia.

There is little question that Florida has suffered harm from decreased flows in the River. Florida experienced an unprecedented collapse of its oyster fisheries in 2012. (Berrigan Direct, at ¶¶ 26-31). In late 2012, oyster mortality reached devastating levels, leaving many previously-productive oyster reefs virtually empty. (*Id.* at ¶¶ 30-31). This was true not only of oyster reefs open to public harvesting, but also oyster reefs subject to private commercial leases. (Ward Direct, at ¶¶ 27-29, 32; Kimbro Direct, at ¶ 34). As explained by Florida's expert, Dr. David Kimbro, and as the National Oceanic and Atmospheric Administration ("NOAA") concluded when it issued a fishery disaster

determination for the Bay in 2013, the oyster collapse came as a result of increased salinity in the Bay caused by low flows in the River. (Kimbro Direct, at ¶¶ 4, 101; Sutton Direct,[24] at ¶ 48; FX413, at NOAA-22896-97; FX 412, at NOAA-3818; *see also* Berrigan Direct, at ¶¶ 36-49). Salinity is one of the major limiting factors in oyster production. (JX124, at 2-206). In 2012, high salinity in the Bay from reduced streamflow allowed marine predators to invade the Bay in unprecedented levels, preying on the Bay's oyster population. (Berrigan Direct, at ¶¶ 42-46; Ward Direct, at ¶¶ 33-37). While Georgia points to potential mismanagement of oyster resources (*e.g.*, overfishing and insufficient "shelling" of oyster reefs[25]) as a cause of the collapse, the evidence presented tends to show that increased salinity rather than harvesting pressure led to the collapse. (Berrigan Direct, at ¶¶ 50-60; JX50; JX77; Ward Direct, at ¶ 41). The oyster collapse has greatly harmed the oystermen of the Apalachicola Region, threatening their long-term sustainability. (Ward Direct, at ¶¶ 24-29, 42).

It also appears that Georgia's upstream agricultural water use has been – and continues to be – largely unrestrained. Agricultural irrigation has increased dramatically in Georgia since 1970. By Florida's count,

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[24] Mr. Sutton is the Assistant Executive Director of the Florida Fish and Wildlife Conservation Commission. (Sutton Direct, at ¶ 2).

[25] "Shelling" involves building a substrate of processed or fossil oyster shell to provide habitat for oyster reproduction. Shelling can significantly increase oyster productivity under favorable conditions, but cannot counteract high salinity conditions. (Berrigan Direct, at ¶¶ 61-63; Ward Direct, at ¶ 41).

Georgia's irrigated acreage has increased from under 75,000 acres in 1970 to more than 825,000 acres in 2014. (Hornberger Direct, at ¶ 77). Georgia's own estimates show a dramatic growth in consumptive water use for agricultural purposes. (Zeng Direct, at ¶¶ 63-64). In the face of this sharp increase in water use, Georgia has taken few measures to limit consumptive water use for agricultural irrigation. Agricultural permits contain no limitations on the amount of irrigation water that can be used by farmers. (Tr. vol. IX, at 2223-24 (Cowie)).[26] Even the exceedingly modest measures Georgia has taken have proven remarkably ineffective. For instance, although Georgia adopted the Flint River Drought Protection Act ("FRDPA"), Ga. Code Ann. § 12-5-540 *et seq.*, in order to permit the State temporarily to "buy back" agricultural irrigation rights at auction and thereby reduce water use during droughts, Georgia failed to implement the FRDPA's auction in 2011 and 2012 during one of the worst droughts on record. (Turner Direct,[27] at ¶¶ 85-95; Tr. vol. IX, at 2259-60 (Cowie); FX81; Tr. vol. XII, at 2999 (Turner); JX69). Despite early warnings of oncoming drought, Georgia's Environmental Protection Division (the "EPD") chose not to declare a drought in 2011 – apparently hoping for the best, and clearly not wishing to incur the cost of preventative action given lack of funding. (Turner

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[26] Dr. Cowie is the Assistant Branch Chief of the Watershed Protection Branch at the Georgia Environmental Protection Division. (Cowie Direct, at ¶¶ 1, 3-4).

[27] Mr. Turner served as Director of Georgia's Environmental Protection Division from January 1, 2012 through June 1, 2016. (Turner Direct, at ¶ 5).

Direct, at ¶ 87; FX78; Tr. vol. IX, at 2258-59 (Cowie)). Then, in 2012, the EPD conveniently took the position that implementing the FRDPA would be "too little, too late" – despite lacking scientific support for that conclusion. (Turner Direct, at ¶ 91; JX69; Tr. vol. XIII, at 3252-56 (Zeng); Tr. vol. XII, at 3081-82 (Turner)). Georgia then continued to issue backlogged irrigation permit applications, issuing only a temporary moratorium on new applications. (Tr. vol. XII, at 3089-90 (Turner)). Georgia's position – practically, politically, and legally – can be summarized as follows: Georgia's agricultural water use should be subject to no limitations, regardless of the long-term consequences for the Basin.[28]

Much more could be said and would need to be said on these issues (as well as other issues, such as causation) were Florida and Georgia the only parties whose activities were implicated in this action. However, they are not. As already described, the Corps also conducts significant operations in the Basin. Regardless of the harm suffered by Florida and the unreasonableness of Georgia's agricultural water use, it is necessary to determine whether the activities of the Corps render uncertain any relief to Florida stemming from a Court decree capping Georgia's consumptive water use. It is to this issue that I now turn.

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[28] It is less clear that Georgia's municipal and industrial water use is unreasonable. Georgia appears to have taken significant steps to conserve water in the Atlanta metropolitan region – though only after having been spurred to take such steps by adverse litigation results. (Turner Direct, at ¶¶ 66-83).

B. The Corps' Operational Protocols for Its Projects in the Basin

In seeking relief from the Court in this original jurisdiction proceeding, Florida maintains that water not consumed by Georgia as a result of a consumption cap will reach the River and will alleviate the harm Florida has suffered. Georgia argues that, regardless of any harm suffered by Florida as a result of Georgia's consumptive water use, equitable apportionment is not justified in this case because any water not consumed by Georgia that results in additional streamflow would not necessarily reach Florida in a timely manner but could – indeed, would – instead be held back by the Corps to satisfy project demands in the Basin. Accordingly, as stated above, the central question presented is whether the Corps' operations so regulate the water in the Basin that no effective remedy is possible without a decree binding the Corps.

In addressing this dispute, I first provide a brief summary of the Corps' reservoir projects and operations before considering the parties' contentions. The Corps describes its operations extensively in its Draft Environmental Impact Statement ("DEIS"), published in October 2015, as part of its revisions to its Master Water Control Manual ("WCM") for the Basin, which was submitted as a joint exhibit at trial. (JX124).[29]

[29] On December 8, 2016, after the close of the evidentiary hearing in this proceeding, I received notice from the United States that the Corps had released its Final Environmental Impact Statement ("FEIS") and WCM for the Basin. (*See* Letter from Michael Gray (Dec. 8, 2016) (Dkt. No. 578)). The FEIS is available

Additional discussion is contained in the May 2012 Biological Opinion on the Jim Woodruff Dam Revised Interim Operating Plan ("RIOP"), as well as the September 2016 Biological Opinion for the WCM, both of which are also joint exhibits submitted at trial. (JX72; JX168). The parties also designated competing experts who described Corps operations. No representative of the Corps appeared at trial, although the United States submitted an *amicus* brief addressing Corps operations.

1. General Corps Operations

As stated above, the Corps operates five projects in the ACF River Basin. (JX124, at 2-23). The three northernmost reservoirs, Lake Lanier, West Point Lake, and Walter F. George Lake, are the only reservoirs with substantial conservation storage capacity. Approximately sixty-five percent of the Corps' usable reservoir storage is in the northernmost reservoir, Lake Lanier. Lake Lanier – which is used to supply water to the Atlanta metropolitan area – lies at the head of the Basin, and is fed by runoff from an area that

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on the Corps' website at: http://www.sam.usace.army.mil/Missions/Planning-Environmental/ACF-Master-Water-Control-Manual-Update/ACF-Document-Library/. I requested that the United States inform me, in its *amicus* brief, of any material changes to Corps operations from the operations described by the parties at trial. When the United States submitted its brief, it represented that the FEIS did not change the Corps' operations in a manner material to this case. I accordingly rely on the exhibits presented at trial, and take judicial notice of the FEIS to the limited extent it is relevant.

makes up seven percent of the Basin. (JX124, at 2-25; Shanahan Direct,[30] at ¶ 20). Approximately nineteen percent of system storage is in West Point Lake, with the remainder of the storage – approximately fifteen percent – in Walter F. George Lake. These two reservoirs are fed by runoff from an area consisting of thirty-one percent of the Basin. (JX124, at 2-25; Shanahan Direct, at ¶ 21). The remaining two projects, George W. Andrews Dam and Jim Woodruff Dam (along with its associated reservoir, Lake Seminole), do not have significant storage capacity and are referred to as "run-of-river" projects – meaning that they simply pass flows downstream without impounding the water for any appreciable length of time. (JX124, at 2-25; Bedient Direct,[31] at ¶ 21; Shanahan Direct, at ¶ 21). These two run-of-river projects are fed by runoff from the remaining sixty-two percent of the land area in the

[30] Dr. Shanahan, Florida's primary expert on reservoir operations, is a consulting hydrologist and environmental engineer, and has held the role of Lecturer in the Department of Civil and Environmental Engineering at the Massachusetts Institute of Technology ("MIT"). He has a Ph.D. in Environmental Engineering from MIT, and has previously been the project engineer on Corps projects. (Shanahan Direct, at ¶¶ 9-15).

[31] Georgia expert Dr. Bedient is the Herman Brown Professor of Civil and Environmental Engineering at Rice University. He has a Ph.D. in Environmental Engineering from the University of Florida, and is a registered Professional Engineer. He has over forty years of experience performing hydrologic and hydraulic modeling of lakes and watersheds, and has extensive experience with federal reservoir projects. (Bedient Direct, at ¶¶ 6-12).

Basin. The water originating in this portion of the Basin is not regulated via storage reservoirs operated by the Corps. (Shanahan Direct, at ¶¶ 21-22).[32]

The Corps is supposed to operate its system of reservoirs as a unified whole in an effort to balance water control operations to meet each of the frequently competing project purposes to the greatest extent possible. (JX124, at 2-62; Bedient Direct, at ¶ 17; Shanahan Direct, at ¶ 24). The project purposes identified in federal law include flood control, hydropower, navigation, conservation of fish and wildlife, recreation, water supply, and preservation of water quality. (JX124, at 2-58 – 2-61; Bedient Direct, at ¶ 17; Shanahan Direct, at ¶ 24). Each of the project purposes is supposed to be considered by the Corps when making water management decisions affecting how water is stored and released. In general, to provide for these authorized project purposes, flow must be stored during wetter times of each year and released from storage during drier periods of each year. (Bedient Direct, at ¶ 17). Traditionally, that means that water is stored in the upstream storage lakes during the spring and released for authorized project purposes in the summer and fall months. (Shanahan Direct, at ¶ 25). The Corps is supposed to continuously monitor the total system water availability to ensure that project purposes can at least be minimally satisfied during critical drought periods. This water management strategy does not prioritize any

[32] A map showing the drainage areas regulated by storage reservoirs operated by the Corps and the drainage area not regulated by storage reservoirs is attached hereto as Appendix G.

project function over another, but seeks to balance all project purposes. (JX124, at 2-63, 4-6, 5-26). Because the Corps operates its reservoirs as a unified system, releases from Jim Woodruff Dam reflect the "downstream end-result of system-wide operations." (JX72, at 7).

The Corps divides its three storage reservoirs into separate storage levels. The lowest level is the inactive pool, which is not used in any material way in the Corps' operations. No reservoir releases are made when a reservoir is below this level. Above the inactive pool is the conservation pool. The water in the conservation pool – the "conservation storage" that can be stored or released for project purposes – is utilized to support the Corps' project purposes.[33] The top of the conservation pool is defined by the Corps' "guide curves," the seasonally variable desired pool elevation in a reservoir that would allow the Corps to meet project purposes fully. The top-most pool is the flood risk pool, where water is stored when it cannot safely be passed downstream (for instance, during large storms). (JX124, at 2-25; Bedient Direct, at ¶ 22; Shanahan Direct, at ¶ 25; Tr. vol. XIII, at 3329-32 (Zeng)).[34] The Corps has stated that it operates its projects to "maintain a balanced use of conservation storage rather than

[33] The sum of the available conservation storage in Lake Sidney Lanier, West Point Lake, and Walter F. George Lake is called the "composite conservation storage." (JX124, at 2-70 – 2-71; Bedient Direct, at ¶ 23).

[34] A depiction of the various storage pools in West Point Lake is included with this Report as Appendix H for illustrative purposes.

to maintain the pools at or above certain predetermined elevations." (JX124, at 5-26; Shanahan Direct, at ¶ 26). The Corps has also noted that it manages its reservoirs "to maintain a steady pool at as high a level as possible, consistent with other authorized purposes, particularly during [May through September]." (JX124, at 2-74 – 2-75; Bedient Direct, at ¶ 159).

The Corps has defined "action zones" for each of its storage reservoirs. Action zones are partitions of a reservoir's conservation storage, and are used to guide Corps operations as the Corps attempts to meet various project purposes during various hydrologic conditions. The Corps has stated that action zones are "used to manage the reservoirs at the highest level possible while balancing the needs of all the authorized purposes." (JX124, at 4-10). Each action zone has a set of operational rules that govern operations for the reservoir when the pool is within that zone. Zone 1, the highest action zone, is a level at which all federal project purposes can be satisfied. As lake levels decline, Zones 2 through 4 define increasingly critical system water shortages and guide the Corps in reducing flow releases resulting from dry or drought conditions, when project purposes can no longer fully be met. (JX124, at 2-25, 4-10; Bedient Direct, at ¶ 24; Shanahan Direct, at ¶ 27; Tr. vol. XIII, at 3333-34 (Zeng)).[35] When the composite conservation storage in the three reservoirs falls into Zone 4, the Corps institutes a set of rules known

[35] A depiction of the action zones for West Point Dam and Lake is included with this Report as Appendix I for illustrative purposes.

as "drought operations." Under drought operations, a number of normal operating rules are supposed to be suspended and special operations apply for releases from Jim Woodruff Dam. Drought operations only conclude when composite conservation storage returns to Zone 1. (JX124, at 4-16; Shanahan Direct, at ¶ 28; Bedient Direct, at ¶ 25).

The Corps' storage projects are supposed to be operated to maintain lake level in the same zones concurrently. However, because of the hydrologic and physical characteristics of the system, there might be periods when one lake is in a different zone than another. When that occurs, the Corps is supposed to make an effort to bring the lakes back into balance with each other as soon as conditions permit. By doing so, effects on the Basin are generally shared among the projects and balance maintained. (JX124, at 4-11; Shanahan Direct, at ¶ 27).

2. The Revised Interim Operating Plan

The Corps and the United States Fish and Wildlife Service ("USFWS") cooperatively developed the RIOP for Jim Woodruff Dam, issued in May 2012, to guide the Corps' operations and releases from the system to produce flows from Jim Woodruff Dam. The RIOP establishes minimum flow rates at the Jim Woodruff Dam under varying conditions, as well as a maximum fall rate (the daily vertical drop in the river stage), in order to minimize the impact of Corps operations on

downstream listed species in Florida. (JX124, at 2-70; Bedient Direct, at ¶ 18; Shanahan Direct, at ¶ 32).

The RIOP ties releases from Jim Woodruff Dam into Florida to: (1) the time of year; (2) the composite conservation storage in the Corps' three storage reservoirs; and (3) total inflow to the Basin. (JX124, at 2-70 – 2-71; Shanahan Direct, at ¶ 32; Bedient Direct, at ¶ 34). There are three seasons under the RIOP – spawning season (March through May), non-spawning season (June through November), and winter (December through February). (JX124, at 2-71 – 2-72). As described above, there are also four action zones and a drought zone based on the composite conservation storage available in the Corps' reservoirs. (*Id.* at 4-10). Finally, there are ranges of Basin inflows, "Basin inflow" being defined as the amount of water that would flow by Jim Woodruff Dam if all of the Corps' reservoirs were kept at their then-existing surface elevation. (*Id.* at 4-24; JX72, at 8).

The chart summarizing the RIOP rules for Jim Woodruff Dam is reproduced on the next page.

May 2012 RIOP for Jim Woodruff Lock and Dam, Apalachicola River Minimum Discharge from Woodruff Lock and Dam by Month and by Basin Inflow (BI) Rates

Months	Composite conservation storage zone	Basin inflow (BI) (cfs)	Releases from Jim Woodruff Lock and Dam (cfs)	BI available for storage[a]
March-May	Zones 1 and 2	≥34,000 ≥16,000 and <34,000 ≥5,000 and <16,000 >5,000	≥25,000 ≥16,000+50% BI>16,000 ≥BI ≥5,000	Up to 100% BI>25,000 Up to 50% BI>16,000
	Zone 3	≥39,000 ≥11,000 and <39,000 ≥5,000 and <11,000 <5,000	≥25,000 ≥11,000+50% BI>16,000 ≥BI ≥5,000	Up to 100% BI>25,000 Up to 50% BI>11,000
June-November	Zones 1, 2, and 3	≥22,000 ≥10,000 and <22,000 ≥5,000 and <10,000 <5,000	≥16,000 ≥10,000+50% BI>10,000 ≥BI ≥5,000	Up to 100% BI>16,000 Up to 50% BI>10,000
December-February	Zones 1, 2, and 3	≥5,000 <5,000	≥5,000 (Store all BI>5,000) ≥5,000	Up to 100% BI>5,000
At all times	Zone 4	NA	≥5,000	Up to 100% BI>5,000
At all times	Drought Zone	NA	≥4,500[b]	Up to 100% BI>4,500

Sources: USACE, Mobile District 2012; USFWS 2012

Notes:

[a] Consistent with safety requirements, flood risk management purposes, and equipment capabilities.

[b] Once composite conservation storage falls below top of Drought Zone, ramp-down to 4,500 cfs will occur at a rate of 0.25 ft/day.

(JX124, at 2-71; *see also* JX72, at 13). The flow rates included in the table are minimum flow rates, rather than specific outflow rates. The symbol "≥" indicates "greater than or equal to." (Shanahan Direct, at ¶ 33).

Under the RIOP, the amount of water released and stored varies depending on the above factors. Depending on Basin inflow, the composite storage zone, and the time of year, certain minimum releases are required at Jim Woodruff Dam. (JX124, at 2-70 – 2-71; Shanahan Direct, at ¶ 32; Tr. vol. XIII, at 3334-35 (Zeng)). When composite conservation storage is in Zones 1, 2, or 3, the Corps is operating normally, and the amount of water released from Jim Woodruff Dam is generally a product of the time of year and the Basin inflow. (Bedient Direct, at ¶ 36). Once composite conservation storage falls into Zone 4, drought contingency operations are triggered. (JX124, at 2-71; Bedient Direct, at ¶¶ 25, 36).

During drought operations, minimum discharge is determined in relation to composite conservation storage, not Basin inflow. The minimum required flow at Jim Woodruff Dam during drought operations is 5,000 cfs; when storage falls below Zone 4, triggering exceptional drought operations, the minimum flow is lowered to 4,500 cfs. These minimum flows are required, even if inflow into the Basin is less than 5,000 cfs. The Corps may store all Basin inflow exceeding minimum releases during drought operations. Drought operations remain effective until upstream federal reservoirs' composite storage level returns to Zone 1; exceptional

drought operations last only during the period of time in which composite storage is below Zone 4. (JX124, at 2-73 – 2-74, 4-16 – 4-17; Bedient Direct, at ¶¶ 25, 36).[36]

The RIOP also specifies the amount of Basin inflow available for storage. Depending on Basin inflow, season, and conservation storage, the RIOP sets several threshold storage ranges. At times, the Corps will augment flows into Florida by releasing more than Basin inflow, such as when Basin inflow is below 5,000 cfs; at other times, the Corps will match releases from Jim Woodruff Dam with Basin inflow, or may store up to fifty percent or even one hundred percent of Basin inflow. (JX124, at 2-71; Bedient Direct, at ¶ 39).

3. The Proposed Water Control Manual

The Corps' proposed WCM retains the same basic framework established in the Corps' existing protocols, including the RIOP, although it sets out a few changes. Significantly, drought operations would begin earlier, in Zone 3 rather than Zone 4. (FEIS, at 5-54 – 5-55). However, the proposed WCM also sets out revised action zones to be used for managing the reservoirs. (*Id.* at 5-52). The proposed WCM would reduce the total amount of time the reservoirs are in Zones 3 and 4. (*Id.* at 6-102 – 6-103). These proposed changes "could trigger slightly constrained operations more frequently

[36] It is also possible to have required minimum flows of 5,000 cfs even if the Corps is not in drought operations. When Basin inflow is less than 5,000 cfs, regardless of the composite conservation storage zone, the Corps is required to release a minimum of 5,000 cfs from Jim Woodruff Dam. (Tr. vol. XIII, at 3337-38 (Zeng)).

and over slightly longer periods, and the extent of those constrained operations would gradually increase as worsening drought conditions may dictate over time." (*Id.* at 6-99). Overall, however, the proposed WCM is "likely to have no appreciable incremental effect on flow conditions in the Apalachicola River compared to the [RIOP]." (*Id.* at 6-93). Accordingly, the proposed WCM does not materially affect the conclusion I reach based on the evidence presented at trial.

C. Effect of the Corps' Operational Protocols on the Availability of an Effective Remedy in this Proceeding

1. The States' Conflicting Claims

The parties dispute whether, given the Corps' operational protocols, any additional streamflow resulting from a reduction in Georgia's consumptive water use would alleviate Florida's harm. The parties' principal arguments are as follows.

Florida argues that, even though the Corps operates multiple reservoirs in the Basin, water from sixty-two percent of Georgia's Basin watershed flows into the Flint River or into the Chattahoochee River downstream from Walter F. George Dam, and is therefore not controlled in any meaningful way by the Corps' storage reservoirs. Florida contends the water from this portion of the Basin flows directly into Lake Seminole and that, because Lake Seminole and Jim Woodruff Dam is a run-of-river project, the water will necessarily flow into Florida with little interruption.

Florida further argues that, pursuant to the Corps' operating rules, the additional water from this portion of the Basin would not be "offset" by the Corps through the release of less water from Lake Lanier, West Point Lake, and Walter F. George Lake.

Georgia does not contest that Lake Seminole and Jim Woodruff Dam is a run-of-river project, but instead argues that the Corps would offset any increased flows from the Flint River into the Apalachicola River by withholding more water upstream in Lake Lanier, West Point Lake, and Walter F. George Lake. In Georgia's view, the activities of the Corps would preclude any increases in Basin inflow during low-flow conditions or drought operations from increasing state-line flows into Florida. Accordingly, Georgia asserts that the only reliable way to ensure additional flow into Florida from reduced consumptive water use would be to alter the Corps' operating rules.

2. Uncertainty Regarding the Availability of an Effective Remedy

I find that Florida has not proven by clear and convincing evidence that any additional streamflow in the Flint River or in the Chattahoochee River would be released from Jim Woodruff Dam into the Apalachicola River at a time that would provide a material benefit to Florida (*i.e.*, during dry periods), thereby alleviating Florida's injury. The evidence presented at trial does not "instantly tilt" the scale in favor of Florida. *See Colorado*, 467 U.S. at 316. The evidence instead tends to show that the Corps' operation of federal reservoirs

along the Chattahoochee River creates a "highly regulated system over much of the [B]asin" (GX544, at 2), rendering any potential benefit to Florida from increased streamflow in the Flint River uncertain and speculative.

a. Uncertainty Regarding the Availability of an Effective Remedy During Drought Operations or Low-Flow Conditions

The evidence presented at trial does not show with sufficient certainty that the Corps must (or will choose to) operate its projects so as to permit all additional flows in the Flint River and lower Chattahoochee River resulting from a decree establishing a consumption cap to flow through to Florida without any substantial delay, thereby permitting the entire marginal increase in streamflow to benefit Florida during drought operations or low-flow conditions. Rather, the evidence suggests that the Corps may operate its projects in the Basin to offset any increased flows into Lake Seminole during drought operations or when there are low flows by releasing less water from Corps reservoirs. As the Corps stated in its post-trial *amicus* brief, "[t]he Corps expects in an extreme low flow scenario [*i.e.*, during drought operations] that Apalachicola River flows would be very similar with or without a consumption cap until enough water is stored to return the system to normal operations." (United States Post-Trial Brief, at 17-18 (Dec. 15, 2016) (Dkt. No. 631)). This conclusion is supported by the evidence presented at trial.

i. The Possibility of Offset Operations by the Corps

The first question to be resolved is whether increased streamflow in the Flint River would *per force* manifest itself as increased streamflow in Florida. Stated another way, it is necessary to determine whether it is physically possible for the Corps to reduce releases from storage reservoirs along the Chattahoochee River if Flint River streamflow were to increase as a result of reduced agricultural irrigation in Georgia, thereby offsetting any potential benefit to Florida through the operation of its reservoirs. If it is not possible for the Corps to offset increased streamflow in the Flint River, Florida would be assured timely relief during drought or low-flow periods. The evidence indicates, however, that increased streamflow in the Flint River will not necessarily translate into increased streamflow in Florida during these periods.

Florida relies primarily on the testimony of Dr. Shanahan, one of its expert hydrologists, to show that it will inevitably receive a benefit from increased streamflow in the Basin during drought and low-flow periods despite the Corps' operation of federal reservoirs along the Chattahoochee River. Dr. Shanahan testified that it is "physically impossible to offset or trade significant quantities of water conserved during the summer of dry years in the Flint River or lower Chattahoochee River for additional water to be stored in distant Lake Lanier" because Lake Lanier receives water from only seven percent of the land area in Georgia's portion of the Basin. (Shanahan Direct, at ¶ 37;

see id. ¶¶ 20, 46-50). Further, Dr. Shanahan also testified that there is little to no reason for the Corps to hold water at the other two reservoirs with storage capacity – West Point Lake and Walter F. George Lake – because they receive much more inflow than Lake Lanier but do not face the same water demands as Lake Lanier, which is the source of Atlanta's water supply. According to Dr. Shanahan, because local inflow into these reservoirs exceeds storage capacity, these two lakes are largely operated in pass-through mode during the summer and fall. (Shanahan Direct, at ¶ 37; *see id.* ¶¶ 21, 43-45; Tr. vol. X, at 2527-28 (Shanahan)). Per Dr. Shanahan, then, the Corps must allow all or most of any additional streamflow from unregulated portions of the Basin to flow downstream into Florida.

While this analysis has some appeal, other evidence casts doubt on Dr. Shanahan's reasoning. First, Dr. Shanahan's own analysis shows that Lake Lanier, by itself, can offset an average of 341 cfs of streamflow in dry years. Thus, Lake Lanier alone could offset over three-quarters of the potential increase in streamflow of 438 cfs contemplated by one of the primary conservation scenarios advanced by Florida. (Bedient Direct, at ¶ 158; *see* Shanahan Direct, at ¶ 49). Second, historical storage data shows that West Point Lake has, during dry years, failed to recover to full reservoir storage, suggesting that inflows are not exceeding the capacity of the reservoir such that all project purposes can be fully satisfied and West Point Lake operated in pass-through mode. (Bedient Direct, at ¶¶ 153-54, 157).

Third, the Corps operates Walter F. George Lake and West Point Lake so as to protect storage levels in Lake Lanier, given that Lake Lanier is more difficult to refill. (JX113, at 3; Bedient Direct, at ¶ 156). The Corps has specified that, under dry conditions when Basin inflows are reduced, project operations are adjusted to conserve storage in West Point Lake and Walter F. George Lake while continuing to meet project purposes in accordance with the relevant action zones. (JX124, at 2-34, 2-39). Fourth, and finally, historical inflow and outflow data suggests that, during drought operations, the Corps releases less water from Walter F. George Lake (representing the combined release from all of the reservoirs on the Chattahoochee River) when local inflow at Lake Seminole increases. This confirms that, at least to some degree, the Corps may offset increased inflow from the Flint River by decreasing releases from its reservoirs along the Chattahoochee River. (Bedient Direct, at ¶¶ 149-50). Accordingly, Dr. Shanahan's analysis of Basin reservoir operations does not reach the level of "clear and convincing" evidence that additional water from the Flint River must flow downstream to Florida without any offset by the Corps.

In a further effort to prove that any additional streamflow from unregulated portions of the Basin must make its way to Florida in a timely manner, Florida also presented the testimony of Dr. Shanahan regarding statistical correlations between increased flows in the Flint River, on the one hand, and releases from Corps reservoirs on the other. According to Dr. Shanahan, if the Corps could trade "extra" water in the

Flint River for reduced releases from storage reservoirs along the Chattahoochee River, there would be a strong correlation between higher Flint River flows and reduced releases from the Corps' storage reservoirs. He found no such correlation. (Shanahan Direct, at ¶¶ 38-39). Dr. Shanahan also testified that, since Lake Seminole cannot store appreciable amounts of water, increased inflows into Lake Seminole should be closely correlated with higher releases from Jim Woodruff Dam. Dr. Shanahan discovered just such a correlation. (*Id.* at ¶ 40). Again, Dr. Shanahan's point is that increased flows in the Flint River will necessarily make its way into Florida without appreciable delay.

However, Dr. Shanahan's statistical analysis does not carry the day. Dr. Shanahan's own analysis shows that Basin inflow and local inflow into Lake Seminole can vary by thousands of cfs without affecting observed flows in the Apalachicola River. (Bedient Direct, at ¶¶ 145-47; GX866, at 109-12). Moreover, Dr. Shanahan's correlation analysis is likely flawed. First, he takes into account both wet and dry seasons. Including high flows will generally show good correlation between inflow and outflow, but the relevant question is how well inflows and outflows correlate during dry periods. Second, he takes into account over twenty-eight years of historical flow data from a period when the RIOP was not in place. It is meaningless to evaluate correlation between outflow and inflow under a significantly different operating regime. (*Id.* at ¶ 148). Accordingly, this testimony is not sufficient to show by clear and convincing evidence that increased streamflow on the

Flint River will inevitably provide timely relief to Florida.

ii. The Likelihood of Offset Operations by the Corps

The conclusion that the Corps can offset local inflow into Lake Seminole by managing releases from its storage reservoirs does not end the inquiry. Even if the Corps can offset increased streamflow in the Flint River by reducing releases from Corps reservoirs along the Chattahoochee River during drought operations or low-flow periods, it is of course possible that the Corps might not engage in such an offset. It is therefore necessary to determine whether the Corps could choose not to offset increased inflow into Lake Seminole, and, if so, whether it would in fact exercise its discretion in favor of releasing more water from Jim Woodruff Dam. While the evidence presented at trial shows that the Corps retains discretion in its operations, how the Corps will exercise that discretion remains unknown.

The evidence supports Florida's contention that the Corps retains the discretion to release more than the required 5,000 cfs minimum set out in the RIOP. As Dr. Shanahan rightly observes, the flow rates in the RIOP are minimum flow rates, rather than specific outflow rates. (Shanahan Direct, at ¶ 33). The Corps and the USFWS both describe these flow rates as "minimum, not target, releases for Jim Woodruff Lock and Dam." (JX124, at 2-72; *see* JX72, at 10). Accordingly,

the Corps may release more than the minimum releases in the table in order to meet various project purposes, like hydropower or flood control, or to maintain the fall rate. (JX72, at 10; JX124, at 2-72 – 2-73, 6-35; Tr. vol. X, at 2485-86, 2530-31 (Shanahan)). Georgia disagrees, characterizing the 5,000 cfs minimum release set out in the RIOP as a "target." For instance, Georgia experts Dr. Bedient and Dr. Zeng testified that the minimum flow specifications were used by the Corps as targets for its releases. (Zeng Direct, at ¶¶ 90-92; *see* Bedient Direct, ¶¶ 26-27). Georgia's experts erred on this point, as their characterization is directly contrary to the Corps' own statements. (JX124, at 2-72 – 2-73). Dr. Zeng admitted at trial that he was unaware of the Corps' statement that the 5,000 cfs minimum flow requirement was not a target. (Tr. vol. XIII, at 3363-66 (Zeng)). Though Florida is right on this point, it does not advance Florida's argument very far. It proves only that the Corps *can* release more than the minimum required releases under the RIOP – not that the Corps *will* make such releases.

In an effort to prove this point, Florida relies on Dr. Shanahan's testimony that the Corps in fact released more than the required minimum amount of water from Lake Seminole into the Apalachicola River during drought operations in 2012 and 2013. (Shanahan Direct, at ¶¶ 57-60). Georgia counters that flows above 5,000 cfs during drought operations can be explained by RIOP requirements such as the maximum fall rate, which requires the Corps to reduce releases from Jim Woodruff Dam at a specified rate – thereby causing the

Corps to release more than 5,000 cfs for a period of time under certain circumstances. (Bedient Direct, at ¶ 28; Zeng Direct, at ¶¶ 97-108). It is likely that RIOP's requirements account for at least part of the "excess" flows below Jim Woodruff Dam, as Dr. Shanahan admitted at trial. (Tr. vol. X, at 2497 (Shanahan)).[37] Nevertheless, Florida is likely correct that the Corps has historically exercised its discretion to release more than the required minimum under the RIOP. As Dr. Shanahan's analysis shows, the Corps released more than 5,000 cfs throughout 2012, even though the RIOP-specified minimum was consistently 5,000 cfs, by a margin that likely cannot be entirely explained by various RIOP requirements and exceptions. (Shanahan Direct, at ¶¶ 57-59; FX811, at 2-4, 20, 24). Indeed, Georgia's expert Dr. Bedient conceded at trial that the Corps has released more than the required RIOP minimum in the past, and even opined in his expert report that this would be within the Corps' discretion. (Tr. vol. XV, at 3934-48 (Bedient); GX866, at 107).[38] This too,

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[37] Dr. Shanahan also admitted that other factors, such as the inherent difficulty in making precise releases from a dam, may explain some marginal increment of the excess releases. The Corps typically releases approximately 5,050 cfs as a margin of safety in order to avoid unintentionally releasing less than 5,000 cfs. (Tr. vol. X, at 2493-94 (Shanahan)). However, the magnitude of the excess flows suggests that the Corps' releases are not entirely explained by an effort to maintain some margin of safety. (*Id.*; Shanahan Direct, at ¶ 59).

[38] It should be noted that the parties dispute the proper measure of releases at Jim Woodruff Dam. Georgia, for its part, insists that the Corps' daily recorded releases are the proper measure. This data arguably better reflects the Corps' intended flow releases because it is derived from provisional (or real-time)

however, fails to satisfy Florida's burden of proof. Dr. Shanahan's testimony proves only that the Corps may have exercised its discretion to release more than it was required to release *in the past*; it has not proven that the Corps will release more than the minimum *in the future*.

Florida does not rely solely on Dr. Shanahan's testimony to meet this final step in the analysis – namely, whether the Corps will exercise its discretion to release more water than required under the RIOP – but instead presents hydrologic modeling to prove that reductions in Georgia's water use would result in increased flows on the Apalachicola River even during drought operations or low-flow periods. Dr. Hornberger, another hydrologist providing expert testimony on behalf of Florida, developed a hydrologic model, the "Lake Seminole model," to determine whether a consumption cap would benefit Florida during summer months in

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flow estimates from the United States Geological Survey (the "USGS") relied upon by the Corps in the conduct of its operations. (Bedient Direct, at ¶ 161; Zeng Direct, at ¶ 92; Tr. vol. XV, at 3950-51 (Bedient)). However, provisional flow data may be inaccurate and is subject to change. (Tr. vol. XV, at 3954-55 (Bedient)). Florida maintains that the USGS' official flow records should be utilized as the proper comparator. The USGS official flow data is adjusted after-the-fact, often being revised upward from the provisional data to reflect final discharge amounts, given the imprecision of dam releases. (Bedient Direct, at ¶ 161; Zeng Direct, at ¶ 93; Tr. vol. X, at 2493 (Shanahan)). This data is arguably most accurate and complete. (Tr. vol. X, at 2535-37 (Shanahan)). It is unnecessary to resolve this dispute because, even using Florida's preferred measure, the fact remains that any release in excess of the mandatory minimum is inherently discretionary and therefore uncertain.

dry years. (Hornberger Direct, at ¶¶ 121-22). Dr. Hornberger used this model to determine how much water the Corps would release from Jim Woodruff Dam, using the discretion left to it under the RIOP, in the event of increased local inflow into Lake Seminole. Based on his modeling, Dr. Hornberger concludes that "the Lake Seminole model confirms that virtually all of the water that Georgia conserves by implementing a remedy will become flow in the Apalachicola River in the summer it is conserved." (*Id.* at ¶ 123).

I am less certain. The critical shortcoming of the Lake Seminole model is that it does not model the operations of all of the Corps reservoirs, but instead simply models Lake Seminole as a single run-of-river project. At trial, Dr. Hornberger conceded that his Lake Seminole model does not perform calculations for all five Corps reservoirs. (Tr. vol. VIII, at 1944-45 (Hornberger)). Because it does not model the Corps' operation of its reservoirs in the Basin as an integrated whole, it does not allow for the possibility that increases in flows from the Flint River will be offset by increases in storage on the Chattahoochee River. That is, it essentially forces all additional water through to Florida. (Bedient Direct, at ¶¶ 184-88; *see* Tr. vol. VIII, at 1950 (Hornberger); GX866, at 96). The Lake Seminole model also fails to fully incorporate the RIOP, in that it does not use Basin inflow as an input for release decisions and generates release decisions that violate required minimum releases. Because the RIOP is not incorporated into the Lake Seminole model, it actually predicts outflows from Jim Woodruff Dam for

certain periods that would be less than the minimum required by the RIOP. (Bedient Direct, at ¶¶ 194-95; Tr. vol. VIII, at 1965-70 (Hornberger)). As a result, the Lake Seminole model does not "fit" historical flow data – rendering its predictive results less than clear and convincing. (Bedient Direct, at ¶ 196). Given the programmatic shortcomings and predictive anomalies with the Lake Seminole model, I conclude that it does not provide sufficient certainty that the Corps will make greater releases at Jim Woodruff Dam than is required in an effort to benefit Florida's ecology.

My conclusion that Florida has not proven by clear and convincing evidence that the Corps will exercise its discretion to make greater releases from Jim Woodruff Dam than required is confirmed by other evidence presented at trial. Notably, the DEIS states that it is the Corps' intent to manage its reservoirs so as "to maintain a steady pool at as high a level as possible, consistent with other authorized purposes, particularly during [May-September]." (JX124, at 2-74 – 2-75). Additionally, testimony presented at trial by Georgia supports the conclusion that increased streamflow in the Flint River from reduced agricultural water may not reach Florida during drought operations or low-flow conditions. Dr. Bedient, Georgia's expert in hydrology and reservoir operations, testified that an increase in Basin inflows resulting from greater Flint River streamflow may simply result in the Corps releasing less from reservoirs along the Chattahoochee River upstream of Lake Seminole as the Corps operates its reservoirs as a single, integrated system. (Bedient Direct,

at ¶¶ 45-47). Georgia's chief hydrologist, Dr. Zeng, also testified that, under the Corps' rules, the "Corps can put every drop of water above 5,000 into storage to recover storage" during drought operations or low-flow periods. (Tr. vol. VIII, at 3340 (Zeng)). While Georgia may be too certain that the Corps will offset increased flows from the Flint River by reducing releases along the Chattahoochee River, the testimony of Dr. Bedient and Dr. Zeng does tend to show that the Corps may well choose not to exercise its discretion in Florida's favor. This is further confirmed by the Corps' operations during 2012 and 2013. Despite drought conditions during that period, the composite reservoir storage in 2013 was higher than it was in 2012 – illustrating the Corps' policy of seeking to balance various project purposes while replenishing storage. (Bedient Direct, at ¶¶ 30-31). Additionally, during drought operations in 2012, Flint River flow varied by up to 2,000 cfs without corresponding spikes in releases by the Corps from Jim Woodruff Dam. (*Id.* at ¶¶ 43-44). In other words, when Flint River flows increased, less water was released by the Corps from its storage reservoirs upstream of Lake Seminole. (Tr. vol. XIII, at 3342-43 (Zeng)). This evidence illustrates the uncertainty regarding the Corps' likely course of action during low-flow periods.

One other piece of evidence bears mentioning here, if only to explain why I do not rely on it. Georgia presented its own modeling in an effort to confirm that reductions in consumptive use leading to increased streamflow in the Flint River may not necessarily

materially increase state-line flows into Florida during dry periods. Dr. Bedient used the Corps' official "Reservoir Simulation" model for the Basin (referred to as "ResSim") to analyze the impact of consumption caps on flows in the Apalachicola River. (Bedient Direct, at ¶¶ 60-61, 73-78). However, ResSim is not an appropriate model for predicting whether or not the Corps will choose to release more than the minimum release prescribed by the RIOP during low-flow periods (*i.e.*, more than 5,000 cfs). The ResSim user manual notes that ResSim is a "very restrictive" model in that it requires the user to specify a "single value" for releases that is "effectively both a minimum and a maximum limit at the same time." (JX46, at 11-15, 11-17; *see* Shanahan Direct, at ¶ 65). As Dr. Bedient conceded, this means that the ResSim model does not recognize that the 5,000 cfs release specified in the RIOP is not a maximum release value. (Tr. vol. XV, at 3962-64 (Bedient); GX866, at 107-08; *see* Shanahan Direct, at ¶ 65). As a result, ResSim cannot accurately predict exercises of the Corps' discretion under low-flow conditions. For instance, Dr. Bedient's ResSim model under-predicted flows in 2011 – a year of low flows – by nearly 63,000 cfs because it allowed only for a 5,050 cfs flow (the additional 50 cfs being programmed into ResSim to account for the Corps' "safety margin" release that is designed to avoid violating the 5,000 cfs minimum) and could not reflect the instances in which the Corps actually released substantially more than 5,000 cfs. (Tr. vol. XV, at 3965-67 (Bedient)). As Dr. Shanahan concisely explained, "ResSim is programmed to only discharge the RIOP minimums. There is no possibility of having any other finding." (Tr. vol. X, at 2542; *see id.*

at 2518-19 (Shanahan)). While I do not credit Dr. Bedient's modeling efforts for these reasons,[39] that conclusion does not alter my overall finding that Florida has not carried its burden of proof as to the effectiveness of a consumption cap as a remedy in this case.

iii. Summary

The evidence presented at trial suggests that the Corps' reservoir operations are a significant, and perhaps the primary, factor influencing the amount of streamflow crossing the state line during times of drought and low flows. The Corps has the ability to store streamflow above 5,000 cfs during dry periods. Unless the Corps' rules are changed, therefore, increased inflow into the reservoir system will not necessarily pass downstream to Florida during these times. Further, while the Corps may choose to release more than the minimum releases specified in the RIOP, there is no way to predict how the Corps will exercise its discretion in the event of increased local inflows into Lake Seminole. It may release additional water from Jim Woodruff Dam, or it may store additional water in its upstream reservoirs. Florida has not proven by clear and convincing evidence that any decree entered in this case will provide relief at the most critical dry periods. Rather, it appears likely that ensuring relief for Florida during these times would require modification of the rules governing the Corps'

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[39] I do find, however, that the ResSim modeling conducted by Georgia is useful for other purposes. *See infra*, Part VI.C.2.b.

reservoir operations and, hence, active participation by the Corps in this proceeding.

b. Uncertainty Regarding the Availability of an Effective Remedy During Periods Not Involving Drought Operations or Low-Flow Conditions

Even though I find that Florida has not proven by clear and convincing evidence that an effective remedy is available during the Corps' drought operations or low-flow periods without a decree binding the Corps, I still must consider whether a consumption cap would provide an effective remedy by assuring Florida increased flows during other periods. Florida notes that a reduction in Georgia's consumptive water use may result in benefits to Florida during non-drought conditions. The United States similarly takes the position that substantial increases in Basin inflow might provide certain benefits to Florida when it is not in drought operations. For instance, the Corps has represented that it may be able to: (1) delay the onset of drought operations by keeping the reservoirs in Zones 1 through 3 for a longer period; (2) extend the amount of time that it can meet the 5,000 cfs minimum flow requirement during drought operations; and (3) pass additional water through Jim Woodruff Dam, providing an immediate increase in flows to Florida, when Basin inflow is between 5,000 and 10,000 cfs. (United States Post-Trial Brief, at 15 (Dec. 15, 2016) (Dkt. No. 631)). However, the potential benefits to Florida of

increased flows in the Flint River during higher flow conditions when the Corps is not in drought operations are uncertain, rendering the efficacy of any relief speculative. Florida has not met its requirement to show by clear and convincing evidence that its injury can be redressed by increased flows during non-drought conditions.

As an initial matter, at trial Florida complained primarily of harm from low flows in drought years. Florida's witnesses did not present evidence that Florida has been harmed by Georgia's water use in "wet" or "average" years, much less that a consumption cap in those years would redress any harm to Florida. Nor did Florida's witnesses present evidence of harm from reduced average annual flows.[40] Instead, Florida's trial presentation focused on the harm from increased periods of low flow. Dr. Hornberger, for instance, testified extensively regarding the increase in the magnitude, frequency, and duration of low flows in the River, and quantified the frequency of low-flow days (*i.e.*, flows between 5,000 to 6,000 cfs) as a result of drought. (Hornberger Direct, at ¶¶ 42-44, 47-48, 51-54, 59-62). Dr. Kimbro, Florida's expert who examined the cause of the collapse of the oyster population in the Bay, relied

[40] In the Order denying Georgia's motion to dismiss, I noted – accepting Florida's factual allegations as true and taking all reasonable inferences in favor of Florida – that Florida's Complaint focused not on "harm from inadequate *minimum* flows, but rather on harm arising from inadequate *average* annual flows." (Order on State of Georgia's Motion to Dismiss, at 12 (Dkt. No. 128)). However, as described below, Florida's evidence at trial focused on harm from low flows rather than average annual flows.

on Dr. Hornberger's testimony regarding increasing frequency of minimum river flows in explaining the injury to Florida's oyster fisheries. (Kimbro Direct, at ¶ 37). Dr. Greenblatt,[41] Florida's expert who provided testimony regarding the effect of a consumption cap on salinity levels in Apalachicola Bay, also relied on Dr. Hornberger's analysis regarding frequency of low flows in her testimony regarding the effect of streamflow on salinity in the Bay. (Greenblatt Direct, at ¶ 14). Further, Dr. Greenblatt's analysis focused on the effect of a reduction in Georgia's water use on salinity in the Bay *during low-flow months*. (Tr. vol. VII, at 1768-71 (Greenblatt)). Tellingly, even during typically low-flow summer months, Dr. Greenblatt calculated that there would be virtually no improvement in salinity conditions in the Bay in wet years (such as 2009). (*Id.* at 1771 (Greenblatt)).[42] As such, Florida in its trial presentation did not meaningfully advance any claim of harm from non-drought years or reduced average annual flows that it may have initially asserted, and instead focused on harm from recurring or sustained low-flow periods. Therefore, any marginal increase in

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[41] Dr. Greenblatt is a water resources engineer with expertise in modeling hydrodynamic flows. Dr. Greenblatt has a Ph.D. in water resources engineering from the University of California, Berkeley. (Greenblatt Direct, at ¶¶ 7-8).

[42] It is also notable that, while I find Florida's claim of harm to the ecosystem of the River is less compelling than its claim of harm to the Bay's ecosystem, Florida's expert testifying to harm in the River also relied on Dr. Hornberger's calculations regarding the number of days with flows below 6,000 cfs and explained the harm to the River's ecosystem in terms of days of low flows below 6,000 cfs rather than in terms of reduced average annual flows. (Allan Direct, at ¶¶ 32, 44, 51; *see* Hornberger Direct, at ¶ 46).

streamflow during the Corps' normal operations does not assist Florida in proving that a decree in this case would provide effective redress.

Even if there were evidence of harm from other than low-flow conditions, Florida did not provide substantial evidence of the benefits (if any) from increased overall flows. Given Florida's focus on harm from low-flow periods, it is unsurprising that Florida's trial presentation did not address the benefits of increased flows during "normal" periods. Florida did not quantify at trial the benefits from shortened drought operations or increased flows during non-drought operations. Indeed, Florida presented no evidence assessing the impact of a consumption cap on shortening the Corps' drought operations or on increased pass-through flows during non-drought conditions. It is possible that such benefits are slim. Pass-through of Basin inflow between 5,000 and 10,000 cfs would occur only when the Corps has not entered drought operations, as the Corps has discretion to store up to one hundred percent of Basin inflow during drought operations. This would have the effect of eliminating pass-through benefits for significant periods where Basin inflow is between 5,000 and 10,000 cfs. (JX124, at 2-71; *see* Bedient Direct, at ¶ 48).

To the extent that the record contains evidence regarding the effect of increased flows on shortened drought operations or increased flows during non-drought operations, that evidence was presented by Georgia and tends to show an absence of any significant benefit to Florida. According to Georgia's expert, Dr. Bedient, there would have been no additional days

of pass-through operations under the Corps' rules during the summer or fall months of 2012 had a consumption cap been imposed. (*See* Bedient Direct, at ¶¶ 55-57). Similarly, Dr. Bedient's ResSim modeling shows that there would be only minimal increased flows into Florida as a result of pass-through operations or shortened drought operations. ResSim, used by the Corps to model regulated watersheds, simulates Basin-wide reservoir operations based on the Corps' operating rules and hydrologic conditions. (*Id.* at ¶¶ 62-63; Zeng Direct, at ¶¶ 115-16). Using the ResSim model, it is possible to change the amount of upstream consumptive use and determine how these changes would impact reservoir levels and streamflow under the Corps' operating rules. (Bedient Direct, at ¶¶ 63-65). Dr. Bedient performed a modeling analysis by developing a "baseline" scenario for ResSim reflecting Georgia's total consumptive use (as calculated by Georgia) in the Basin in 2011 and then comparing various consumption cap scenarios against that baseline in order to isolate the effect of Georgia's consumptive use on state-line flows. (*Id.* at ¶¶ 73-75). In essence, Dr. Bedient used ResSim to project how long the Corps' reservoirs would be in each action zone and how long the Corps could avoid drought operations given different Basin inflows. Based on his modeling, Dr. Bedient concluded that a reduction in Georgia's consumptive use (as calculated by Georgia) by thirty percent, or even to 1992 levels, would lead to virtually no change in state-line flows. Dr. Bedient also found that an increase of streamflow in the Basin of 1,000 cfs, as Florida suggests is possible, would result in only minimal increases in state-line flows in critical summer

months. (*Id.* at ¶¶ 60-62, 78-87; Tr. vol. XV, at 4002-05 (Bedient); GX866, at 69).[43]

Florida criticizes Georgia's use of the ResSim model. Florida argues that ResSim should not be used as a predictive model because it cannot accurately capture the Corps' discretion and because it utilizes Georgia's consumptive use data, which may underestimate Georgia's water use. (Shanahan Direct, at ¶¶ 54-56; Tr. vol. XV, at 3967-73 (Bedient)). However, the shortcomings identified by Florida are not relevant when ResSim is used for comparative purposes (as Dr. Bedient used it) because any errors are canceled out. The ResSim model is therefore a valid tool for evaluating the impact of increased streamflow from the imposition of a consumption cap as compared to a historical record. Accordingly, it is useful when used to compare how long the Corps would be functioning under normal operating procedures versus drought procedures under different flow conditions. (*See* Bedient Direct, at ¶¶ 73-77; Tr. vol. XV, at 3969, 3972-75, 4000 (Bedient)).

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[43] Florida's hydrology expert, Dr. Hornberger, reached similar results when he conducted modeling using ResSim. Using ResSim, Dr. Hornberger found that a fifty percent reduction in Georgia's agricultural use would not lead to any increased streamflow into Florida for many of the dry months during dry years such as those experienced in 2011 and 2012. (Tr. vol. VIII, at 1933-35 (Hornberger); Bedient Direct, at ¶¶ 177-80; GX866, at 95). Given the modeling results of Dr. Hornberger, as well as the results reached by Dr. Bedient when he modeled Florida's proposed increase in streamflow of 1,000 cfs, I have no basis to conclude that a consumption cap will afford Florida effective relief even if I accept Florida's estimates of the increased streamflow that would result from a consumption cap.

ResSim is reliable when used for these purposes. According to the Corps, ResSim is "the standard for [Corps] reservoir operations modeling," and is the "tool most capable of faithfully representing" reservoir operations. (JX124, at 4-3; *see id.* at ES-14 n.2; Bedient Direct, at ¶¶ 65-66). Dr. Bedient performed a "goodness-of-fit" analysis, the standard method for evaluating the ability of a model to predict data, by simulating ResSim releases and comparing those modeled outflows with observed flows from 2008 through 2011. The results of this analysis indicated that ResSim is an accurate model.[44] (Bedient Direct, at ¶¶ 67-71; Tr. vol. XV, at 4000 (Bedient)). Accordingly, I find that ResSim is a reliable and useful model when used to determine whether Florida would receive increased state-line flows as a result of the Corps' ability to operate normally for longer periods of time.

In sum, Florida has provided no evidence that a decree in this case could provide an effective remedy during normal (*i.e.*, non-drought) periods. Further, the evidence presented by Georgia tends to show that, even to the extent that Florida may receive additional state-line flows as a result of increases in Basin inflow from a cap on Georgia's consumptive water use, the benefits to Florida are likely rare and unpredictable. (*See* Bedient Direct, at ¶ 58). Florida's lack of proof,

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[44] Further, a "goodness-of-fit" analysis conducted by Florida's own expert, Dr. Hornberger, revealed that ResSim had a better "fit" to the data than his own Lake Seminole model for many years – including some dry years. (Tr. vol. VIII, at 1950-60 (Hornberger)).

combined with the credible testimony offered by Georgia, leads me to conclude that Florida has not carried its burden to show that it can obtain meaningful redress without a decree that binds the Corps, even when one considers the possibility of increased pass-through during non-drought conditions or shortened drought operations.

VII. CONCLUSION

In issuing the Order on Georgia's motion to dismiss, I observed that "Florida's claim will live or die based on whether Florida can show that a consumption cap is justified and will afford adequate relief." (Order on Georgia's Motion to Dismiss, at 13 (Dkt. No. 128) (citing *Idaho*, 444 U.S. at 392)). Florida has failed to show that a consumption cap will afford adequate relief. The testimony and evidence submitted at trial demonstrates that the Corps can likely offset increased streamflow in the Flint River by storing additional water in its reservoirs along the Chattahoochee River during dry periods. The evidence also shows that the Corps retains extensive discretion in the operation of those federal reservoirs. As a result, the Corps can release (or not release) water largely as it sees fit, subject to certain minimum requirements under the RIOP. There is no guarantee that the Corps will exercise its discretion to release or hold back water at any particular time. Further, Florida has not shown that it would benefit from increased pass-through operations under normal conditions. Finally, without the Corps as a party, the Court cannot order the Corps to take any

particular action. Accordingly, Florida has not proven by clear and convincing evidence that any additional streamflow in the Flint River resulting from a decree imposing a consumptive cap on Georgia's water use would be released from Jim Woodruff Dam into the River at a time that would provide a material benefit to Florida.

VIII. RECOMMENDATION

Because Florida has not met its burden, I recommend that the Court deny Florida's request for relief. A proposed decree embodying my recommendation is attached as Appendix J.

Dated: February 14, 2017

Respectfully submitted,

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Special Master
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APPENDIX A

Florida v. Georgia No. 142, Original

The official docket sheet for this case, as maintained by the Clerk of the Supreme Court of the United States, is available online. The official docket sheet does not contain entries for papers filed directly with the Special Master. The Special Master has prepared the following docket sheet which includes all filings made with or by the Special Master, in ".pdf" format.

Ralph I. Lancaster, Jr., Special Master

Pierce Atwood LLP
Merrill's Wharf
254 Commercial Street
Portland, Maine 04101

Docket No.	Date	Filings
1	2014-11-3	Complaint – Florida v. Georgia, No. 142, Original
2	**2014-11-19**	**Order Appointing Ralph Lancaster Special Master**
3	**2014-11-21**	**Notice of Initial Telephone Conference 12/1/14**
4	**2014-11-24**	**Oath of Special Master Ralph Lancaster**
5	**2014-12-3**	**Case Management Order No. 1**
6	**2014-12-3**	**Case Management Plan**
7	**2014-12-5**	**Transcript of Initial Telephone Conference of 12/1/14**

8	2014-12-10	Joint Request to Modify Case Management Plan (re 6)
9	**2014-12-11**	**Notice of Telephone Conference to be Held 12/15/14**
10	**2014-12-15**	**Transcript of Telephone Conference of 12/15/14**
11	2014-12-17	C. Primis Letter to Special Master (re 6,8)
12	**2014-12-19**	**Case Management Order No. 2** (re 6,8,11)
13	**2014-12-19**	**Special Master Letter to Counsel**
14	**2014-12-22**	**Corrected Special Master Letter to Counsel** (re 6,8,11)
15	2015-1-8	Answer to Complaint (re 1)
16	2015-1-12	Certificate of Service – GA First Request for Production to FL
17	2015-1-12	Certificate of Service – GA First Interrogatories to FL
18	2015-1-12	Certificate of Service – FL First Request for Production to GA
19	2015-1-12	Certificate of Service – FL First Interrogatories to GA
20	2015-1-22	Joint Letter from Counsel to Special Master
21	**2015-1-23**	**Special Master Letter to Counsel** (re 20)
22	2015-1-30	C. Primis Letter to Special Master

23	**2015-1-30**	**Case Management Order No. 3** (re 5,12,22)
24	2015-2-3	Certificate of Service – FL's Service of Non-Party Subpoenas
25	2015-2-3	Certificate of Service – FL's Responses to GA's First Request for Production
26	2015-2-3	Certificate of Service – GA's Service of Non-Party Subpoenas
27	2015-2-3	Certificate of Service – GA's Responses to FL's First Request for Production
28	**2015-2-4**	**Notice of Telephone Conference to be Held 2/10/15**
29	2015-2-5	M. Gray Letter to Special Master
30	**2015-2-5**	**J. Dunlap Letter to M. Gray** (re 29)
31	2015-2-5	C. Davis Letter to Special Master
32	**2015-2-6**	**J. Dunlap Letter to C. Davis** (re 31)
33	2015-2-6	GA Status Report
34	2015-2-6	FL Status Report
35	2015-2-9	US Statement of Participation
36	2015-2-9	J. Skipper Letter to Special Master

37	2015-2-9	K. Robbin Letter to Special Master
38	**2015-2-10**	**J. Dunlap Letter to J. Skipper** (re 36)
39	**2015-2-10**	**J. Dunlap Letter to K. Robbin** (re 37)
40	**2015-2-10**	**Case Management Order No. 4**
41	2015-2-11	Agreement Regarding Document Production and Electronic Discovery Procedures
42	2015-2-11	Certificate of Service – GA Objections to FL First Interrogatories
43	2015-2-11	Certificate of Service – GA First and Second Production to FL First Document Request
44	2015-2-11	Certificate of Service – FL Objections to GA First Interrogatories
45	2015-2-11	Certificate of Service – FL First Production to GA First Document Request
46	2015-2-12	Certificate of Service – GA's Service of Non-Party Subpoenas
47	**2015-2-16**	**Transcript of Telephone Conference 2/10/15**
48	2015-2-16	GA's Motion to Dismiss for Failure to Join a Required Party

49	2015-2-16	Exhibits A and B to GA's Motion to Dismiss for Failure to Join a Required Party (re 48)
50	2015-2-18	Certificate of Service – GA's Service of Non-Party Subpoenas
51	2015-2-20	M. Gray Letter to Special Master (re 48)
52	**2015-2-23**	**Case Management Order No. 5** (re 23,48,51)
53	2015-2-26	Certificate of Service – GA Response to FL Interrogatories
54	2015-2-26	Certificate of Service – FL Response to GA Interrogatories
55	2015-3-2	Certificates of Service – FL's Service of Non-Party Subpoenas
56	2015-3-2	Joint Proposed Protective Order
57	**2015-3-3**	**Case Management Order No. 6** (re 56)
58	2015-3-6	FL Status Report
59	2015-3-6	GA Status Report
60	2015-3-6	Certificate of Service – GA 2nd Request for Production to FL
61	2015-3-6	Certificate of Service – GA 2nd Interrogatories to FL
62	2015-3-6	Certificate of Service – GA 3rd Production to FL

63	2015-3-10	Certificate of Service – FL's Service of Non-Party Subpoenas
64	2015-3-10	Certificate of Service – GA's Service of Non-Party Subpoenas
65	2015-3-10	Certificate of Service – FL 2nd Production to GA
66	2015-3-11	United States' Amicus Curiae Brief in Opposition to GA's Motion to Dismiss (re 48)
67	2015-3-11	Certificate of Service – FL's Service of Non-Party Subpoenas
68	2015-3-12	Certificate of Service – FL 3rd Production to GA
69	2015-3-12	Joint Certificate of Service – GA and FL Touhy Requests and Subpoenas
70	2015-3-13	Certificate of Service – FL 2nd Set of Interrogatories and 2nd Request for Production to GA
71	2015-3-13	Certificate of Service – FL's Service of Non-Party Subpoenas
72	2015-3-13	Certificate of Service – FL's Service of Non-Party Subpoenas
73	2015-3-13	Certificate of Service – GA 3rd Request for Production to FL

74	**2015-3-16**	**Transcript of Telephone Conference 3/13/15**
75	2015-3-18	FL's Opposition to GA's Motion to Dismiss (re 48)
76	2015-3-19	M. Caplan Letter to Special Master
77	2015-3-23	M. Gray Letter to Special Master
78	2015-3-23	J. Dwoskin Letter to Special Master
79	**2015-3-24**	**J. Dunlap Correspondence to J. Dwoskin** (re 78)
80	2015-3-24	M. Gray Letter to Special Master
81	2015-3-24	C. Primis Letter to Special Master (re 52)
82	**2015-3-25**	**J. Dunlap Correspondence to C. Primis** (re 81)
83	2015-3-25	R. Mowrey Letter to Special Master
84	2015-3-25	A. Whalen Letter to Special Master
85	2015-3-26	K. Keene Letter to Special Master
86	2015-3-26	Certificate of Service – FL Response and Objections to GA 2nd Request for Production
87	2015-3-27	Certificate of Service – GA 4th Production to FL

88	2015-4-1	M. Hurley Letter to Special Master
89	2015-4-2	Certificate of Service – GA 5th Production to FL
90	2015-4-2	Certificate of Service – GA Response and Objections to FL 2nd Request for Production
91	2015-4-2	Joint Motion for Confidentiality
92	2015-4-2	Certificate of Service – FL Responses to GA Discovery
93	2015-4-3	Certificate of Service – FL 4th Production to GA
94	2015-4-3	FL Status Report
95	2015-4-3	Certificate of Service – GA 6th Production to FL
96	2015-4-3	GA Reply Memo re Motion to Dismiss (re 48)
97	2015-4-3	GA Status Report
98	2015-4-6	Certificate of Service – FL Objections to GA 2nd Set of Interrogatories
99	**2015-4-8**	**Case Management Order No. 7** (re 6)
100	**2015-4-10**	**Transcript of Telephone Conference 4/7/15**
101	**2015-4-13**	**Case Management Order No. 8** (re 91)
102	2015-4-13	Certificate of Service – GA Objections to FL 2nd Set of Interrogatories

103	**2015-4-17**	**J. Dunlap Email Notice to Counsel Scheduling Hearing** (re 48)
104	2015-4-20	Certificate of Service – FL Responses to GA 2nd Set of Interrogatories
105	2015-4-22	M. Gray Letter to Special Master (re 35,103)
106	**2015-4-23**	**Case Management Order No. 9** (re 35,105)
107	2015-4-27	Certificate of Service – GA Responses to FL 2nd Set of Interrogatories
108	2015-4-30	C. Primis Letter to Special Master (re 12,99)
109	2015-4-30	Certificate of Service – GA Third-Party Productions to FL
110	2015-4-30	Certificate of Service – GA 7th Production to FL
111	2015-5-1	Certificate of Service – FL 2nd Supplement to GA First Set of Interrogatories
112	2015-5-1	FL's Brief re Joinder of Alabama (re 48)
113	2015-5-1	GA Status Report
114	2015-5-1	Certificate of Service – GA 8th Production to FL
115	2015-5-1	GA's Supplemental Brief re Motion to Dismiss (re 48)
116	2015-5-1	FL Status Report

117	2015-5-1	Alabama's Amicus Curiae Brief re Non-Joinder of Alabama (re 48)
118	**2015-5-4**	**J. Dunlap Email Notice to Counsel re Status Conference**
119	**2015-5-11**	**Case Management Order No. 10** (re 6,108)
120	2015-5-29	Certificate of Service – GA Third-Party Productions to FL
121	2015-5-29	Certificate of Service – GA 9th Production to FL
122	2015-5-29	Certificate of Service – GA First Supplemental Responses to FL 1st Interrogatories
123	2015-5-29	Certificate of Service – GA First Supplemental Responses to FL 2nd Interrogatories
124	2015-6-4	Certificate of Service – GA 10th Production to FL
125	**2015-6-8**	**Transcript of Hearing 6/2/15** (re 48)
126	2015-6-15	Certificate of Service – GA 11th Production to FL
127	**2015-6-16**	**Transcript of Telephone Conference 6/9/15**
128	**2015-6-19**	**Order re GA Motion to Dismiss** (re 48)
129	2015-6-22	Certificate of Service – GA 12th Production to FL

130	2015-6-29	J. Rousseaux Letter to Special Master
131	**2015-6-30**	**J. Dunlap Correspondence to J. Rousseaux**
132	2015-7-1	Certificate of Service – GA Third-Party Production to FL
133	**2015-7-1**	**J. Dunlap Email Notice to Counsel re Status Conference**
134	2015-7-6	M. Gray Letter to Special Master
135	2015-7-7	Certificate of Service – GA 13th Production to FL
136	2015-7-8	Certificate of Service – FL Touhy Request
137	**2015-7-9**	**J. Dunlap Correspondence to M. Gray** (re 134)
138	2015-7-9	M. Gray Correspondence to J. Dunlap (re 134,137)
139	2015-7-9	GA Status Report
140	2015-7-9	FL Status Report
141	2015-7-9	Certificate of Service – FL 7th Production to GA
142	**2015-7-13**	**J. Dunlap Email Notice to Counsel re Status Conference Schedule**
143	**2015-7-13**	**J. Dunlap Correspondence to M. Gray** (re 134)

144	2015-7-13	Certificate of Service – FL's Service of Non-Party Subpoenas
145	**2015-7-22**	**Transcript of Telephone Conference 7/13/15**
146	2015-7-27	Certificate of Service – GA Third-Party Production to FL
147	2015-8-5	Certificate of Service – GA 14th Production to FL
148	2015-8-5	Certificate of Service – GA 15th Production to FL
149	2015-8-7	GA Status Report
150	2015-8-7	FL Status Report
151	2015-8-7	Certificate of Service – FL 8th Production to GA
152	**2015-8-10**	**J. Dunlap Correspondence to Counsel**
153	2015-8-10	A. Winsor Correspondence to J. Dunlap (re 152)
154	2015-8-10	C. Primis Correspondence to J. Dunlap (re 152)
155	2015-8-26	Certificate of Service – FL's Notice of Deposition
156	2015-8-26	Certificate of Service – FL's Notice of Deposition
157	2015-8-26	Certificate of Service – FL's Notice of Deposition
158	2015-8-26	Certificate of Service – FL's Notice of Deposition

159	2015-8-26	Certificate of Service – GA 16th Production to FL
160	2015-8-28	Certificate of Service – FL's Notice of Deposition
161	2015-8-28	Certificate of Service – FL's Notice of Deposition
162	2015-8-28	Certificate of Service – FL's Notice of Deposition
163	2015-8-28	Certificate of Service – FL's Notice of Deposition
164	2015-8-28	Certificate of Service – FL's Notice of Deposition
165	2015-8-28	Certificate of Service – FL's Notice of Deposition
166	2015-9-2	Certificate of Service – FL Third-Party Production to GA
167	2015-9-4	FL Status Report
168	2015-9-4	GA Status Report
169	2015-9-4	Certificate of Service – FL 9th Production to GA
170	2015-9-9	Certificate of Service – GA 17th Production to FL
171	2015-9-10	Certificate of Service – FL's Notice of Deposition
172	2015-9-11	Certificate of Service – FL Third-Party Production to GA
173	**2015-9-11**	**Transcript of Telephone Conference 9/8/15**

174	2015-9-15	Certificate of Service – GA's Notice of Deposition
175	2015-9-15	Certificate of Service – GA's Notice of Deposition
176	2015-9-15	Certificate of Service – GA's Notice of Deposition
177	2015-9-15	Certificate of Service – GA's Notice of Deposition
178	2015-9-15	Certificate of Service – GA's Notice of Deposition
179	2015-9-15	Certificate of Service – GA's Notice of Deposition
180	2015-9-15	Certificate of Service – GA's Notice of Deposition
181	2015-9-15	Certificate of Service – GA's Notice of Deposition
182	2015-9-15	Certificate of Service – GA's Notice of Deposition
183	2015-9-15	Certificate of Service – GA's Notice of Deposition
184	2015-9-15	Certificate of Service – GA's Notice of Deposition
185	2015-9-15	Certificate of Service – GA's Notice of Deposition
186	2015-9-15	Certificate of Service – GA's Notice of Deposition
187	2015-9-16	Certificate of Service – FL 10th Production to GA
188	2015-9-18	Certificate of Service – FL's Notice of Deposition

189	2015-9-18	Certificate of Service – FL's Notice of Deposition
190	2015-9-18	Certificate of Service – FL's Notice of Deposition
191	2015-9-18	Certificate of Service – FL's Notice of Deposition
192	2015-9-18	Certificate of Service – FL's Notice of Deposition
193	2015-9-18	Certificate of Service – FL's Notice of Deposition
194	2015-9-18	Certificate of Service – FL's Notice of Deposition
195	2015-9-18	Certificate of Service – FL's Notice of Deposition
196	2015-9-21	Certificate of Service – FL's Notice of Deposition
197	2015-9-21	Certificate of Service – FL's Notice of Deposition
198	2015-9-21	Certificate of Service – FL's Notice of Deposition
199	2015-9-21	Certificate of Service – FL's Notice of Deposition
200	2015-9-22	Certificate of Service – GA Third-Party Production to FL
201	2015-9-23	C. Primis Correspondence to Special Master
202	2015-9-24	Certificate of Service – GA's Notice of Deposition
203	2015-9-24	Certificate of Service – GA's Notice of Deposition

204	2015-9-24	Certificate of Service – GA's Notice of Deposition
205	**2015-9-24**	**Notice of Telephone Conference on 9/29/15**
206	2015-9-25	Certificate of Service – FL First Requests for Admission to GA
207	2015-9-25	Certificate of Service – FL 3rd Set of Interrogatories to GA
208	2015-9-25	Certificate of Service – GA First Requests for Admission to FL
209	2015-9-25	Certificate of Service – GA 3rd Set of Interrogatories to FL
210	2015-9-28	C. Pendergrast Correspondence to Special Master
211	**2015-9-28**	**Special Master Correspondence to C. Pendergrast**
212	2015-9-28	Certificate of Service – GA Third-Party Production to FL
213	2015-9-29	Certificate of Service – FL 11th Production to GA
214	2015-10-1	C. Primis Letter to Special Master (re 201)
215	2015-10-1	P. Perry Letter to Special Master (re 201)
216	2015-10-1	Certificate of Service – FL 12th Production to GA
217	2015-10-1	Certificate of Service – GA 18th Production to FL
218	2015-10-2	GA Status Report

219	2015-10-2	FL Status Report
220	2015-10-2	Certificate of Service – FL 2nd Supplemental Responses to GA First Interrogatories
221	**2015-10-5**	**J. Dunlap Correspondence to Counsel**
222	**2015-10-5**	**Transcript of Telephone Conference 9/29/15** (re 201)
223	**2015-10-6**	**Case Management Order No. 11**
224	2015-10-7	Certificate of Service – GA's Notice of Deposition
225	2015-10-7	Certificate of Service – GA's Notice of Deposition
226	2015-10-7	Certificate of Service – GA's Notice of Deposition
227	2015-10-7	Certificate of Service – GA's Notice of Deposition
228	2015-10-7	Certificate of Service – GA's Notice of Deposition
229	2015-10-7	Certificate of Service – GA's Notice of Deposition
230	2015-10-7	Certificate of Service – GA's Notice of Deposition
231	2015-10-7	Certificate of Service – GA's Notice of Deposition
232	2015-10-7	Certificate of Service – GA's Notice of Deposition
233	2015-10-7	Certificate of Service – GA's Notice of Deposition

234	2015-10-7	Certificate of Service – GA's Notice of Deposition
235	2015-10-7	Certificate of Service – GA's Notice of Deposition
236	2015-10-7	Certificate of Service – GA's Notice of Deposition
237	2015-10-7	Certificate of Service – GA's Notice of Deposition
238	2015-10-7	Certificate of Service – GA's Notice of Deposition
239	2015-10-7	Certificate of Service – GA's Notice of Deposition
240	2015-10-7	Certificate of Service – GA's Notice of Deposition
241	2015-10-7	Certificate of Service – GA's Notice of Deposition
242	2015-10-8	Certificate of Service – FL's Notice of Deposition
243	2015-10-8	Certificate of Service – FL's Notice of Deposition
244	2015-10-8	Certificate of Service – FL's Notice of Deposition
245	2015-10-8	Certificate of Service – FL's Notice of Deposition
246	2015-10-8	Certificate of Service – FL's Notice of Deposition
247	2015-10-8	Certificate of Service – FL's Notice of Deposition
248	2015-10-9	Certificate of Service – FL's Revised Notice of Deposition

249	2015-10-9	Certificate of Service – FL's Revised Notice of Deposition
250	**2015-10-9**	**Transcript of Telephone Conference 10/6/15**
251	2015-10-12	P. Perry Correspondence to Special Master
252	2015-10-12	C. Primis Correspondence to Special Master (re 251)
253	**2015-10-12**	**Notice of Telephone Conference 10/16/15** (re 251)
254	2015-10-12	Certificate of Service – GA's Cross-Notice of Deposition
255	2015-10-12	Certificate of Service – GA's Cross-Notice of Deposition
256	2015-10-12	Certificate of Service – FL 13th Production to GA
257	2015-10-14	Certificate of Service – FL's Objections to Notice of Deposition
258	**2015-10-16**	**Case Management Order No. 12** (re 251)
259	2015-10-16	Certificate of Service – FL Third-Party Productions to GA
260	2015-10-16	Certificate of Service – FL 14th Production to GA
261	2015-10-21	Certificate of Service – GA's Notice of Deposition
262	2015-10-21	Certificate of Service – GA's Notice of Deposition
263	2015-10-21	Certificate of Service – GA's Notice of Deposition

264	2015-10-21	Certificate of Service – GA's Notice of Deposition
265	2015-10-21	Certificate of Service – GA's Notice of Deposition
266	2015-10-21	Certificate of Service – GA's Notice of Deposition
267	**2015-10-21**	**Transcript of Telephone Conference 10/16/15** (re 251)
268	2015-10-23	C. Primis Letter to Special Master
269	2015-10-23	Certificate of Service – FL 15th Production to GA
270	2015-10-23	Certificate of Service – FL's Notice of Deposition
271	2015-10-23	Certificate of Service – FL's Notice of Deposition
272	2015-10-23	Certificate of Service – FL's Notice of Deposition
273	**2015-10-26**	**J. Dunlap Correspondence to Counsel** (re 268)
274	2015-10-26	C. Primis Letter to Special Master (re 268)
275	2015-10-26	P. Perry Letter to Special Master (re 268)
276	2015-10-26	P. Perry Correspondence to J. Dunlap (re 273)
277	2015-10-26	C. Primis Correspondence to J. Dunlap (re 273)

278	2015-10-26	Certificate of Service – FL Objections to GA Request for Admissions
279	2015-10-26	Certificate of Service – FL Objections to GA 3rd Set of Interrogatories
280	2015-10-26	Certificate of Service – GA Objections to FL Request for Admissions
281	2015-10-26	Certificate of Service – GA Objections to FL 3rd Set of Interrogatories
282	2015-10-27	Certificate of Service – GA's Revised Notice of Deposition
283	**2015-10-28**	**Notice of Telephone Conference on 11/2/15** (re 268)
284	2015-10-30	M. Gray Correspondence to J. Dunlap (re 283)
285	**2015-11-2**	**J. Dunlap Correspondence to M. Gray** (re 284)
286	**2015-11-2**	**Case Management Order No. 13** (re 268,283)
287	2015-11-2	Certificate of Service – FL 16th Production to GA
288	2015-11-3	Certificate of Service – FL's Notice of Deposition
289	**2015-11-4**	**Transcript of Telephone Conference 11/2/15** (re 268,283)
290	2015-11-6	FL Status Report

291	2015-11-6	GA Status Report
292	2015-11-6	Certificate of Service – GA Third-Party Productions to FL
293	2015-11-9	Certificate of Service – GA Response to FL 3rd Interrogatories
294	2015-11-9	Certificate of Service – GA Response to FL Request for Admissions
295	2015-11-9	Certificate of Service – GA Notice of Deposition
296	2015-11-9	Certificate of Service, Revised and Amended – FL 17th Production to GA
297	2015-11-9	Certificate of Service – FL 18th Production to GA
298	2015-11-9	Certificate of Service – FL 1st Supplemental Response to GA 2nd Interrogatories
299	2015-11-9	Certificate of Service – FL 3rd Supplemental Response to GA First Interrogatories
300	2015-11-9	Certificate of Service – FL Response to GA 3rd Set of Interrogatories
301	2015-11-9	Certificate of Service – FL Response to GA Request for Admissions
302	2015-11-10	Certificate of Service – GA 2nd Supplemental Response to FL First Interrogatories

303	2015-11-10	Certificate of Service – GA 19th Production to FL
304	2015-11-10	Certificate of Service – FL Privilege Log
305	2015-11-10	Certificate of Service – FL Third-Party Production to GA
306	2015-11-10	Certificate of Service – FL 19th Production to FL
307	2015-11-10	Certificate of Service – FL 20th Production to GA
308	2015-11-10	Certificate of Service – GA 20th Production to FL
309	2015-11-10	Certificate of Service – FL 21st Production to GA
310	2015-11-11	Certificate of Service – FL Objection to Notice of Deposition
311	**2015-11-16**	**Transcript of Telephone Conference 11/10/15**
312	2015-11-18	Certificate of Service – FL's Notice of Deposition
313	2015-11-18	Certificate of Service – FL's Notice of Deposition
314	2015-11-23	Certificate of Service – GA Response and Objection to Subpoena
315	2015-11-24	Certificate of Service – GA Responses and Objections to Notice of Deposition
316	2015-11-24	Certificate of Service – GA Third-Party Production to FL

317	2015-11-28	Certificate of Service – GA Third-Party Production to FL
318	2015-12-1	Certificate of Service – FL Third-Party Production to GA
319	2015-12-1	Certificate of Service – FL's Revised Notice of Deposition
320	2015-12-4	FL Status Report
321	2015-12-4	GA Status Report
322	2015-12-4	Certificate of Service – FL Amended Notice of Deposition
323	2015-12-4	Certificate of Service – GA 22nd Production to FL and 3rd Supplemental Response to FL 1st Interrogatories
324	2015-12-7	Certificate of Service – GA 4th Supplemental Response to FL 1st Interrogatories
325	2015-12-7	Certificate of Service – GA 1st Supplemental Response to FL 3rd Interrogatories
326	**2015-12-8**	**J. Dunlap Email Notice to Counsel re Status Conference Schedule**
327	2015-12-9	Certificate of Service – GA Privilege Log to FL
328	**2015-12-10**	**Transcript of Telephone Conference 12/8/15**
329	2015-12-11	Certificate of Service – GA's Notice of Deposition

330	2015-12-14	Certificate of Service – GA 23rd Production to FL
331	2015-12-15	Certificate of Service – GA's Notice of Deposition
332	2015-12-18	Certificate of Service – FL's Notice of Deposition
333	2015-12-18	Certificate of Service – FL's Cross-Notice of Deposition
334	2015-12-22	Certificate of Service – GA Objection to FL Amended Notice of Deposition
335	2015-12-23	Certificate of Service – FL Third-Party Production to GA
336	2015-12-23	Certificate of Service – FL First Supplemental Production to GA
337	2015-12-23	Certificate of Service – GA 24th Production to FL
338	2015-12-30	Certificate of Service – FL Supplemental Response to Requests for Admission
339	2016-1-4	Certificate of Service – FL Third-Party Production to GA
340	2016-1-4	Certificate of Service – FL 2nd Supplemental Response to Requests for Admission
341	2016-1-6	Certificate of Service – FL's Notice of Deposition
342	2016-1-8	GA Status Report
343	2016-1-8	FL Status Report

344	2016-1-8	Certificate of Service – FL Third-Party Production to GA
345	2016-1-8	Certificate of Service – FL's Notice of Deposition
346	2016-1-8	Certificate of Service – FL's Notice of Deposition
347	2016-1-8	Certificate of Service – FL's Notice of Deposition
348	2016-1-11	Certificate of Service – FL Amended Cross-Notice of Deposition
349	2016-1-11	Certificate of Service – FL Notice of Deposition
350	2016-1-11	Certificate of Service – GA Revised Notice of Deposition
351	2016-1-13	FL's Brief re Deposition of Commissioner of Agriculture & Consumer Services
352	2016-1-13	Certificate of Service – FL's Notice of Deposition
353	**2016-1-14**	**Case Management Order No. 14**
354	**2016-1-15**	**Transcript of Status Conference 1/12/16**
355	2016-1-15	Certificate of Service – GA 5th Supplemental Response to FL 1st Interrogatories
356	2016-1-15	Certificate of Service – GA Categorical Privilege Log to FL

357	2016-1-15	Certificate of Service – GA 25th Production to FL
358	2016-1-18	GA's Response to FL's Brief re Deposition of Commissioner of Agriculture & Consumer Services (re 351)
359	2016-1-18	Certificate of Service – GA's Notice of Deposition
360	**2016-1-20**	**Case Management Order No. 15**
361	2016-1-22	Certificate of Service – GA Third-Party Production to FL
362	2016-1-23	Certificate of Service – FL's Amended Notice of Deposition
363	2016-1-25	Certificate of Service – FL 4th Supplemental Response to GA 1st Interrogatories
364	2016-1-25	Certificate of Service – FL 2nd Supplemental Response to GA 2nd Interrogatories
365	2016-1-25	Certificate of Service – FL 2nd Supplemental Response to GA 3rd Interrogatories
366	2016-1-25	Certificate of Service – FL 2nd Supplemental Production to GA
367	2016-1-25	Certificate of Service – FL Third-Party Productions to GA
368	2016-1-26	Certificate of Service – FL's Notice of Deposition

369	2016-2-1	Certificate of Service – GA 6th Supplemental Responses to FL 1st Interrogatories and GA 26th Production of Documents to FL
370	2016-2-2	Certificate of Service – GA Response and Objection to FL Subpoena
371	2016-2-4	Certificate of Service – FL 3rd Supplemental Production to GA
372	2016-2-5	FL Status Report
373	2016-2-5	GA Status Report
374	2016-2-5	Certificate of Service – FL 4th Supplemental Production to GA
375	2016-2-5	Certificate of Service – FL Third-Party Production to GA
376	2016-2-9	Certificate of Service – FL 5th Supplemental Production to GA
377	2016-2-10	Certificate of Service – FL Third-Party Production to GA
378	2016-2-10	Certificate of Service – FL 6th Supplemental Production to GA
379	**2016-2-11**	**Transcript of Status Conference 2/9/16**
380	2016-2-11	Certificate of Service – FL Third-Party Production to GA

381	2016-2-12	Certificate of Service – FL 7th Supplemental Production to GA
382	2016-2-12	Certificate of Service – FL 5th Supplemental Response to GA 1st Interrogatories
383	2016-2-12	Certificate of Service – FL 3rd Supplemental Response to GA 3rd Interrogatories
384	2016-2-14	Certificate of Service – GA 27th Production to FL
385	2016-2-19	Certificate of Service – FL 4th Supplemental Response to GA 3rd Interrogatories
386	2016-2-19	Certificate of Service – FL 6th Supplemental Response to GA 1st Interrogatories
387	2016-2-19	Certificate of Service – FL 8th Supplemental Production to GA
388	2016-2-23	Certificate of Service – FL 9th Supplemental Production to GA
389	2016-2-26	Certificate of Service – GA 28th Production to FL
390	2016-2-27	Certificate of Service – FL 7th Supplemental Response to GA 1st Interrogatories
391	2016-2-27	Certificate of Service – FL 10th Supplemental Production to GA

392	2016-2-29	GA's Expert Designation and Notice of Service of Expert Report
393	2016-2-29	FL's Expert Designation
394	2016-2-29	Certificate of Service – FL Expert Reports
395	2016-2-29	Certificate of Service – FL 1st Expert Document Production
396	2016-2-29	Certificate of Service – FL 5th Supplemental Response to GA 3rd Interrogatories
397	2016-3-2	Certificate of Service – FL Third-Party Production to GA
398	2016-3-4	FL Status Report
399	2016-3-4	GA Status Report
400	2016-3-8	Certificate of Service – FL's Notice of Deposition
401	2016-3-10	A. Winsor Correspondence to Clerk of U.S. Supreme Court
402	2016-3-10	A. Winsor Correspondence to Special Master
403	**2016-3-10**	**Transcript of Status Conference 3/8/16**
404	2016-3-11	FL's Notice of Withdrawal, Appearance and Substitution of Counsel of Record (re 401,402)
405	2016-3-11	Certificate of Service – GA 29th Production to FL
406	2016-3-14	GA's Motion for Extension of Expert Discovery Deadlines

407	2016-3-15	FL's Response to GA's Motion for Extension of Expert Discovery Deadlines (re 406)
408	2016-3-15	D. Allon Letter to Special Master
409	**2016-3-16**	**Case Management Order No. 16** (re 408)
410	2016-3-16	GA's Reply in Support of Motion for Extension of Expert Discovery Deadlines (re 406)
411	2016-3-17	Certificate of Service – FL Updated Privilege Log
412	**2016-3-21**	**J. Dunlap Email Notice to Counsel re Status Conference Schedule**
413	2016-3-22	Certificate of Service – FL Second Updated Privilege Log
414	**2016-3-24**	**Case Management Order No. 17** (re 406)
415	2016-3-25	Certificate of Service – GA Notice of Deposition
416	2016-4-1	FL Status Report
417	2016-4-1	GA Status Report
418	2016-4-1	Certificate of Service – GA Notices of Deposition
419	2016-4-6	Certificate of Service – GA Third-Party Production to FL
420	**2016-4-7**	**Transcript of Telephone Conference 4/5/16**

421	2016-4-12	Certificate of Service – GA Second Updated Privilege Log
422	2016-4-13	S. Carter Letter to Special Master
423	2016-5-6	FL Status Report
424	2016-5-6	GA Status Report
425	**2016-5-12**	**Transcript of Status Conference 5/10/16**
426	2016-5-20	Certificate of Service – FL Defensive Expert Reports
427	2016-5-20	Certificate of Service – FL Defensive Expert Document Production
428	2016-5-20	Certificate of Service – GA Defensive Expert Disclosure and Reports
429	2016-5-20	Certificate of Service – GA Responsive Expert Document Production
430	2016-5-23	FL's Motion for Extension of Expert Discovery
431	2016-5-23	M. Goldstein Letter to Special Master
432	**2016-5-25**	**J. Dunlap Correspondence to M. Goldstein** (re 431)
433	2016-5-25	GA's Response to FL's Motion to Extend Expert Discovery (re 430)
434	2016-6-2	Certificate of Service – FL's Notice of Deposition

435	2016-6-2	Certificate of Service – FL's Notice of Deposition
436	2016-6-2	Certificate of Service – FL's Notice of Deposition
437	2016-6-2	Certificate of Service – FL's Notice of Deposition
438	2016-6-2	Certificate of Service – FL's Notice of Deposition
439	2016-6-2	Certificate of Service – FL's Notice of Deposition
440	2016-6-2	Certificate of Service – FL's Notice of Deposition
441	2016-6-2	Certificate of Service – FL's Notice of Deposition
442	2016-6-3	GA Status Report
443	2016-6-3	FL Status Report
444	2016-6-6	GA Proposed Trial Schedule
445	2016-6-6	FL Proposed Trial Schedule
446	**2016-6-9**	**Transcript of Status Conference 6/8/16**
447	**2016-6-13**	**J. Dunlap Email Notice to Counsel re Conference Schedule**
448	**2016-6-20**	**Case Management Order No. 19**
449	2016-6-30	FL's Request for Minor Clarifications to Case Management Order No. 19

450	2016-6-30	GA's Objections to Case Management Order No. 19
451	2016-7-1	FL Status Report
452	2016-7-1	GA Status Report
453	**2016-7-6**	**J. Dunlap Email Notice to Counsel re Telephone Conference** (re 449,450)
454	**2016-7-13**	**Case Management Order No. 20**
455	**2016-7-14**	**Transcript of Telephone Conference 7/12/16**
456	**2016-7-18**	**M. Clifford Email Notice to Counsel re Telephone Conference**
457	**2016-7-27**	**Transcript of Telephone Conference 7/26/16**
458	**2016-7-27**	**Case Management Order No. 21**
459	**2016-8-1**	**J. Dunlap Correspondence to Counsel** (re 454,458)
460	2016-8-5	FL Status Report
461	2016-8-5	GA Status Report
462	**2016-8-8**	**J. Dunlap Email Notice to Counsel**
463	**2016-8-29**	**J. Dunlap Email Notice to Counsel**
464	2016-9-2	GA Status Report
465	2016-9-2	FL Status Report

466	2016-9-9	Ruhl Motion for Leave to File an Amicus Brief
467	2016-9-12	Motion for Leave to Withdraw of D. Blankenau and T. Wilmoth
468	2016-9-12	Certificate of Service – FL Production of Documents to GA
469	2016-9-14	Certificate of Service – GA Notices of Deposition
470	2016-9-15	National Audubon Society, Defenders of Wildlife, Florida Wildlife Federation, and Apalachicola Riverkeeper Motion for Permission to File Amicus Curiae Brief
471	2016-9-16	GA's Motion to Submit Trial Exhibits Under Seal or with Redactions
472	2016-9-16	GA's Motion to Exclude Opinions and Testimony by Florida Based on the "Lake Seminole" Model
473	2016-9-16	FL's Motion in Limine to Preclude Expert Testimony by Dr. Irmak
474	2016-9-16	FL's Motion in Limine to Preclude Expert Testimony by Dr. Bedient and Dr. Panday
475	2016-9-16	FL's Motion to Withhold Information in Trial Exhibit from the Public Record

476	2016-9-16	Certificate of Service – FL Supplemental Responses to GA Interrogatories
477	**2016-9-16**	**Order on Motion to Withdraw** (re 467)
478	2016-9-16	Lake Lanier Association, Inc. Motion for Leave to File an Amicus Brief
479	2016-9-16	Georgia Farm Bureau Federation Motion for Leave to File Brief of Amicus Curiae
480	2016-9-16	Atlanta Regional Commission Motion for Leave to Participate as Amicus Curiae
481	2016-9-16	State of Alabama Motion for Leave to File Pretrial Amicus Curiae Brief
482	2016-9-16	Metro Atlanta Chamber of Commerce, Inc., Regional Business Coalition of Metropolitan Atlanta, Inc. and Georgia Chamber of Commerce, Inc. Motion for Leave to File an Amicus Brief
483	2016-9-16	Georgia Agribusiness Council, Inc., Georgia Green Industry Association, Inc. and Georgia Urban Agriculture Council, Inc. Motion for Permission to File Amicus Curiae Brief

484	2016-9-16	Georgia Municipal Association, Association County Commissioners of Georgia, Georgia Association of Water Professionals and Georgia Conservancy Motion for Leave to File a Brief as Amicus Curiae
485	2016-9-16	Chattahoochee Riverkeeper, Flint Riverkeeper and Alabama Rivers Alliance Motion for Leave to File an Amicus Curiae Brief
486	2016-9-16	American Peanut Shellers Association and Georgia Fruit and Vegetable Growers Association Motion for Leave to File Amicus Curiae Brief
487	2016-9-16	State of Colorado Motion for Leave to File Brief as Amicus Curiae
488	**2016-9-21**	**Order on Motions for Leave to File Amicus Briefs** (re 466,470,478,479,480,481,482, 483,484,485,486,487)
489	**2016-9-22**	**J. Dunlap Email Notice to Counsel re Final Pre-Trial Status Conference**
490	2016-9-30	FL's Opposition to GA's Motion to Exclude Opinions and Testimony by Florida Based on the "Lake Seminole" Model (re 472)

491	2016-9-30	FL's Response to GA's Motion to Submit Trial Exhibits Under Seal or with Redactions (re 471)
492	2016-9-30	GA's Opposition to FL's Motion in Limine Regarding Expert Testimony of Dr. Suat Irmak (re 473)
493	2016-9-30	GA's Opposition to FL's Motion in Limine Regarding "Lost Water" in Florida (re 474)
494	2016-10-7	FL's Status Report
495	2016-10-7	GA's Status Report
496	2016-10-7	FL's Reply in Support of Motion in Limine to Exclude the Testimony by Dr. Irmak (re 473,492)
497	2016-10-7	GA's Reply Brief in Support of Motion to Exclude Opinions and Testimony by Florida Basded on the "Lake Seminole" Model (re 472,490)
498	2016-10-7	FL's Reply Memo to Preclude Expert Testimony by Drs. Bedient and Panday on 'Lost Water' (re 474,493)
499	**2016-10-11**	**Order Regarding Use of Electronic Equipment**
500	2016-10-11	Certificate of Service – GA Document Production
501	2016-10-12	FL's Pretrial Brief

502	2016-10-12	GA's Pretrial Brief
503	**2016-10-13**	**Transcript of Status Conference 10/11/16**
504	2016-10-14	P. Perry Letter to Special Master
505	2016-10-14	Certificate of Service – FL Pre-Filed Direct Testimony
506	2016-10-17	C. Primis Letter to Special Master (re 504)
507	2016-10-18	P. Perry Letter to Special Master (re 504,506)
508	2016-10-19	C. Primis Letter to Special Master
509	2016-10-19	P. Perry Letter to Special Master (re 508)
510	2016-10-19	Amicus Brief of J.B. Ruhl
511	2016-10-20	G. Chipev Correspondence to J. Dunlap
512	**2016-10-20**	**J. Dunlap Correspondence to G. Chipev** (re 511)
513	**2016-10-20**	**Order of Special Master** (re 504,506,507,508,509)
514	2016-10-21	Proposed Order on Georgia's Motion to Submit Trial Exhibits Under Seal or with Redactions and Florida's Motion to Withhold Information in Trial Exhibit From the Public Record
515	2016-10-21	M. Gray Letter to Special Master

516	2016-10-21	Amicus Brief of Chattahoochee Riverkeeper; Flint Riverkeeper; and Alabama Rivers Alliance
517	2016-10-21	Amicus Brief of Georgia Farm Bureau Federation
518	2016-10-21	Amicus Brief of State of Colorado
519	2016-10-21	Amicus Brief of The Atlanta Regional Commission
520	2016-10-21	Amicus Brief of State of Alabama
521	2016-10-21	Amicus Brief of The Georgia Municipal Association; The Association County Commissioners of Georgia; The Georgia Association of Water Professionals; and The Georgia Conservancy
522	2016-10-21	Amicus Brief of The Georgia Agribusiness Council, Inc.; Georgia Green Industry Association, Inc.; and The Georgia Urban Agriculture Council, Inc.
523	2016-10-21	Amicus Brief of The Metro Atlanta Chamber of Commerce, Inc.; Regional Business Coalition of Metropolitan Atlanta, Inc.; and Georgia Chamber of Commerce, Inc.
524	2016-10-21	Amicus Brief of National Audubon Society; Defenders of Wildlife; Florida Wildlife

		Federation; and Apalachicola Riverkeeper
525	2016-10-22	Amicus Brief of American Peanut Shellers Association and Georgia Fruit and Vegetable Growers Associations
526	**2016-10-24**	**Order on Georgia's Motion to Submit Trial Exhibits Under Seal or with Redactions and Florida's Motion to Withhold Information in Trial Exhibit from the Public Record** (re 471,475,514)
527	2016-10-26	C. Primis Letter to Special Master
528	2016-10-26	Certificate of Service – GA Pre-Filed Direct Testimony
529	2016-10-26	FL's Updated Pretrial Brief
530	2016-10-26	FL's Summary of Updated Pretrial Brief (re 529)
531	2016-10-26	Certificate of Service – FL Updated Pre-Filed Direct Testimony
532	2016-10-26	Trial Exhibit List
533	2016-11-4	FL Pre-Filed Direct Testimony – Affidavit of D. Hicks (re 505)
534	2016-11-4	FL Pre-Filed Direct Testimony – J. Allan (Updated) (re 531)
535	2016-11-4	FL Pre-Filed Direct Testimony – R. Beaton (Updated) (re 531)

536	2016-11-4	FL Pre-Filed Direct Testimony – M. Berrigan (Updated) (re 531)
537	2016-11-4	FL Pre-Filed Direct Testimony – A. Bottcher (Updated) (re 531)
538	2016-11-4	FL Pre-Filed Direct Testimony – B. Cyphers (re 505)
539	2016-11-4	FL Pre-Filed Direct Testimony – S. Douglass (re 505)
540	2016-11-4	FL Pre-Filed Direct Testimony – S. Flewelling (re 505)
541	2016-11-4	FL Pre-Filed Direct Testimony – P. Glibert (Updated) (re 531)
542	2016-11-4	FL Pre-Filed Direct Testimony – M. Greenblatt (re 505)
543	2016-11-4	FL Pre-Filed Direct Testimony – S. Hartsfield (re 505)
544	2016-11-4	FL Pre-Filed Direct Testimony – T. Hoehn (Updated) (re 531)
545	2016-11-4	FL Pre-Filed Direct Testimony – G. Hoogenboom (re 505)
546	2016-11-4	FL Pre-Filed Direct Testimony – G. Hornberger (Updated) (re 531)
547	2016-11-4	FL Pre-Filed Direct Testimony – D. Kimbro (Updated) (re 531)
548	2016-11-4	FL Pre-Filed Direct Testimony – G. Kondolf (re 505)

549	2016-11-4	FL Pre-Filed Direct Testimony – D. Langseth (Updated) (re 531)
550	2016-11-4	FL Pre-Filed Direct Testimony – D. Lettenmaier (re 505)
551	2016-11-4	FL Pre-Filed Direct Testimony – S. Scyphers (re 505)
552	2016-11-4	FL Pre-Filed Direct Testimony – P. Shanahan (Updated) (re 531)
553	2016-11-4	FL Pre-Filed Direct Testimony – J. Steverson (Updated) (re 531)
554	2016-11-4	FL Pre-Filed Direct Testimony – D. Struhs (re 505)
555	2016-11-4	FL Pre-Filed Direct Testimony – D. Sunding (Updated) (re 531)
556	2016-11-4	FL Pre-Filed Direct Testimony – E. Sutton (Updated) (re 531)
557	2016-11-4	FL Pre-Filed Direct Testimony – T. Ward (re 505)
558	2016-11-4	FL Pre-Filed Direct Testimony – J. White (Updated) (re 531)
559	2016-11-4	GA Pre-Filed Direct Testimony – P. Bedient (re 528)
560	2016-11-4	GA Pre-Filed Direct Testimony – R. Cantor (re 528)
561	2016-11-4	GA Pre-Filed Direct Testimony – C. Couch (re 528)

562	2016-11-4	GA Pre-Filed Direct Testimony – G. Cowie (re 528)
563	2016-11-4	GA Pre-Filed Direct Testimony – S. Irmak (re 528)
564	2016-11-4	GA Pre-Filed Direct Testimony – A. Kirkpatrick (re 528)
565	2016-11-4	GA Pre-Filed Direct Testimony – R. Lipcius (re 528)
566	2016-11-4	GA Pre-Filed Direct Testimony – M. Masters (re 528)
567	2016-11-4	GA Pre-Filed Direct Testimony – P. Mayer (re 528)
568	2016-11-4	GA Pre-Filed Direct Testimony – W. McAnally (re 528)
569	2016-11-4	GA Pre-Filed Direct Testimony – C. Menzie (re 528)
570	2016-11-4	GA Pre-Filed Direct Testimony – S. Panday (re 528)
571	2016-11-4	GA Pre-Filed Direct Testimony – H. Reheis (re 528)
572	2016-11-4	GA Pre-Filed Direct Testimony – R. Stavins (re 528)
573	2016-11-4	GA Pre-Filed Direct Testimony – J. Turner (re 528)
574	2016-11-4	GA Pre-Filed Direct Testimony – W. Zeng (re 528)
575	**2016-12-6**	**Courtroom Minutes: Trial Proceedings**
576	**2016-12-6**	**Trial Witness List**

577	**2016-12-14**	**J. Dunlap Correspondence to M. Gray**
578	2016-12-14	M. Gray Letter to Special Master
579	**2016-12-14**	**J. Dunlap Correspondence to M. Gray** (re 578)
580	2016-12-14	FL Pre-Filed Direct Testimony – P. Shanahan (2nd Updated)
581	**2016-12-14**	**Final Trial Exhibit List**
582	**2016-12-15**	**Trial Transcript Vol XIV – 11-22-16**
583	2016-12-15	FL Objections to Pre-Filed Direct Testimony of P. Bedient (re 559)
584	2016-12-15	FL Objections to Pre-Filed Direct Testimony of C. Couch (re 561)
585	2016-12-15	FL Objections to Pre-Filed Direct Testimony of G. Cowie (re 562)
586	2016-12-15	FL Objections to Pre-Filed Direct Testimony of A. Kirkpatrick (re 564)
587	2016-12-15	FL Objections to Pre-Filed Direct Testimony of R. Lipcius (re 565)
588	2016-12-15	FL Objections to Pre-Filed Direct Testimony of M. Masters (re 566)

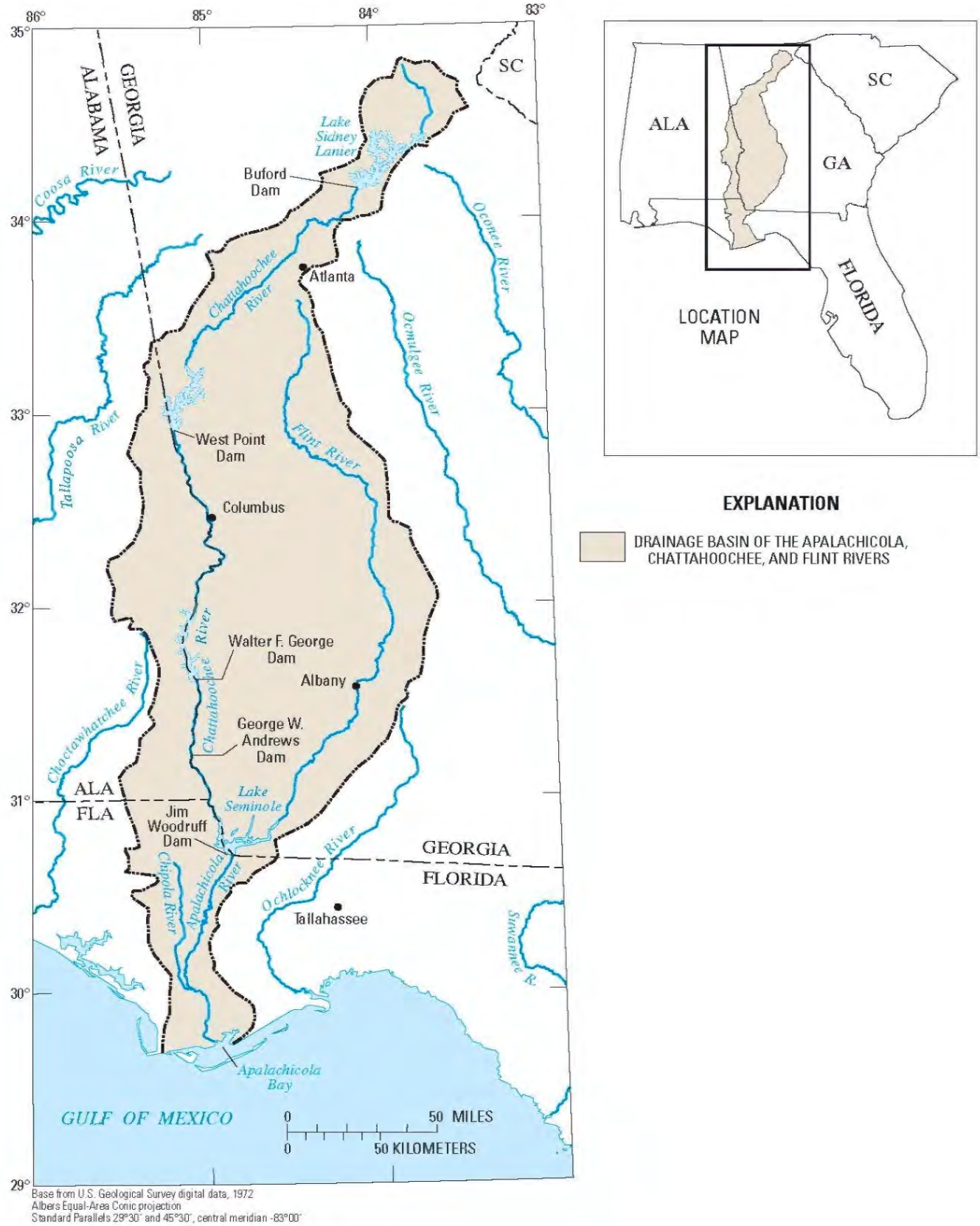
589	2016-12-15	FL Objections to Pre-Filed Direct Testimony of P. Mayer (re 567)
590	2016-12-15	FL Objections to Pre-Filed Direct Testimony of W. McAnally (re 568)
591	2016-12-15	FL Objections to Pre-Filed Direct Testimony of C. Menzie (re 569)
592	2016-12-15	FL Objections to Pre-Filed Direct Testimony of W. Panday (re 570)
593	2016-12-15	FL Objections to Pre-Filed Direct Testimony of H. Reheis (re 571)
594	2016-12-15	FL Objections to Pre-Filed Direct Testimony of R. Stavins (re 572)
595	2016-12-15	FL Objections to Pre-Filed Direct Testimony of J. Turner (re 573)
596	2016-12-15	FL Objections to Pre-Filed Direct Testimony of W. Zeng (re 574)
597	2016-12-15	GA Objections to Pre-Filed Direct Testimony of B. Beaton (re 535)
598	2016-12-15	GA Objections to Pre-Filed Direct Testimony of M. Berrigan (re 536)

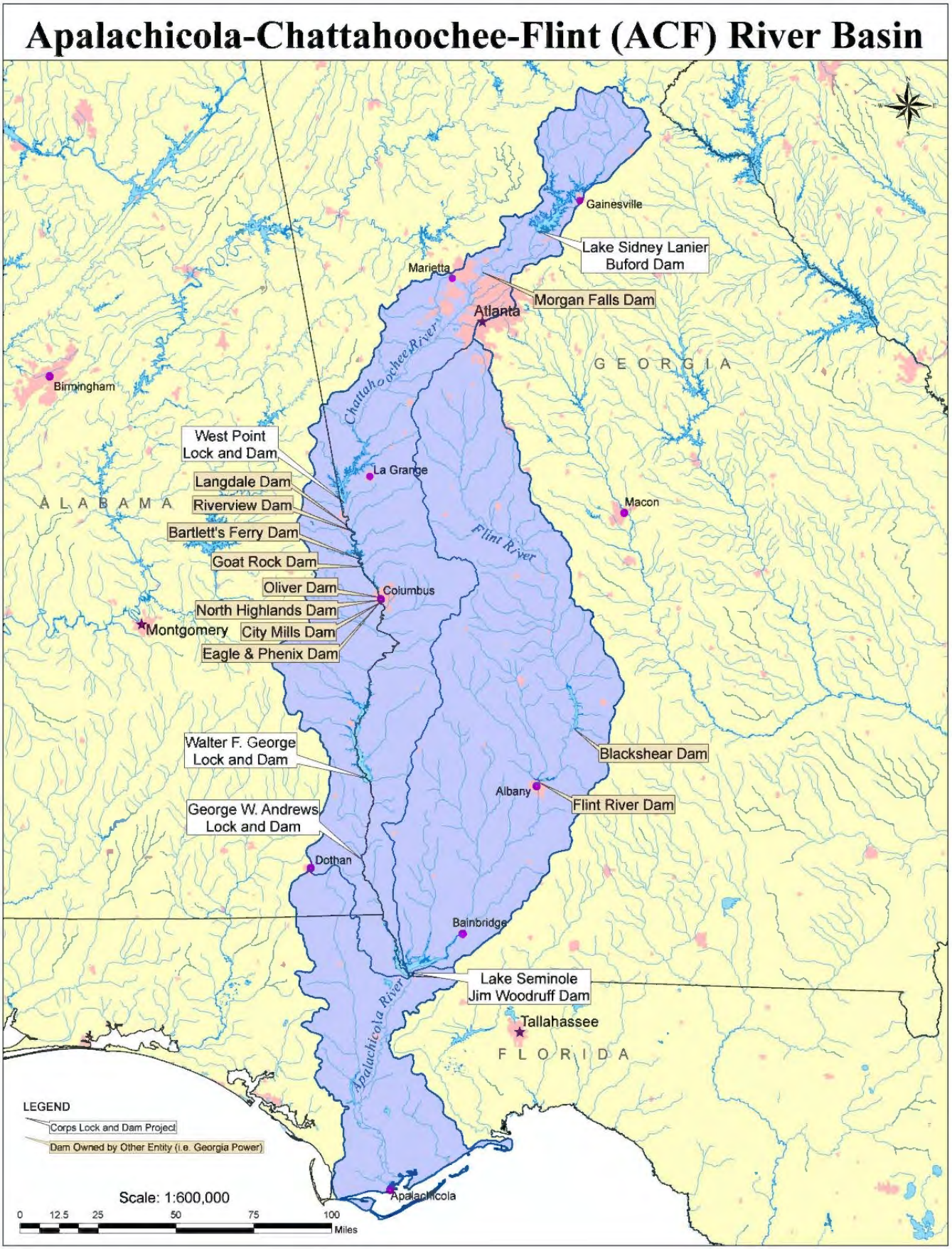
599	2016-12-15	GA Objections to Pre-Filed Direct Testimony of B. Cyphers (re 538)
600	2016-12-15	GA Objections to Pre-Filed Direct Testimony of P. Glibert (re 541)
601	2016-12-15	GA Objections to Pre-Filed Direct Testimony of M. Greenblatt (re 542)
602	2016-12-15	GA Objections to Pre-Filed Direct Testimony of T. Hoehn (re 544)
603	2016-12-15	GA Objections to Pre-Filed Direct Testimony of G. Hornberger (re 546)
604	2016-12-15	GA Objections to Pre-Filed Direct Testimony of D. Kimbro (re 547)
605	2016-12-15	GA Objections to Pre-Filed Direct Testimony of G. Kondolf (re 548)
606	2016-12-15	GA Objections to Pre-Filed Direct Testimony of D. Lettenmaier (re 550)
607	2016-12-15	GA Objections to Pre-Filed Direct Testimony of P. Shanahan (re 580)
608	2016-12-15	GA Objections to Pre-Filed Direct Testimony of D. Struhs (re 554)

609	2016-12-15	GA Objections to Pre-Filed Direct Testimony of D. Sunding (re 555)
610	2016-12-15	GA Objections to Pre-Filed Direct Testimony of E. Sutton (re 556)
611	2016-12-15	GA Objections to Pre-Filed Direct Testimony of W. White (re 558)
612	**2016-12-15**	**Trial Transcript Vol. I – 10/31/16**
613	**2016-12-15**	**Trial Transcript Vol. II – 11/1/16**
614	**2016-12-15**	**Trial Transcript Vol. III – 11/3/16**
615	**2016-12-15**	**Trial Transcript Vol. IV – 11/4/16**
616	**2016-12-15**	**Trial Transcript Vol. V – 11/7/16**
617	**2016-12-15**	**Trial Transcript Vol. VI – 11/8/16**
618	**2016-12-15**	**Trial Transcript Vol. VII – 11/9/16**
619	**2016-12-15**	**Trial Transcript Vol. VIII – 11/10/16**
620	**2016-12-15**	**Trial Transcript Vol. IX – 11/14/16**
621	**2016-12-15**	**Trial Transcript Vol. X – 11/16/16**

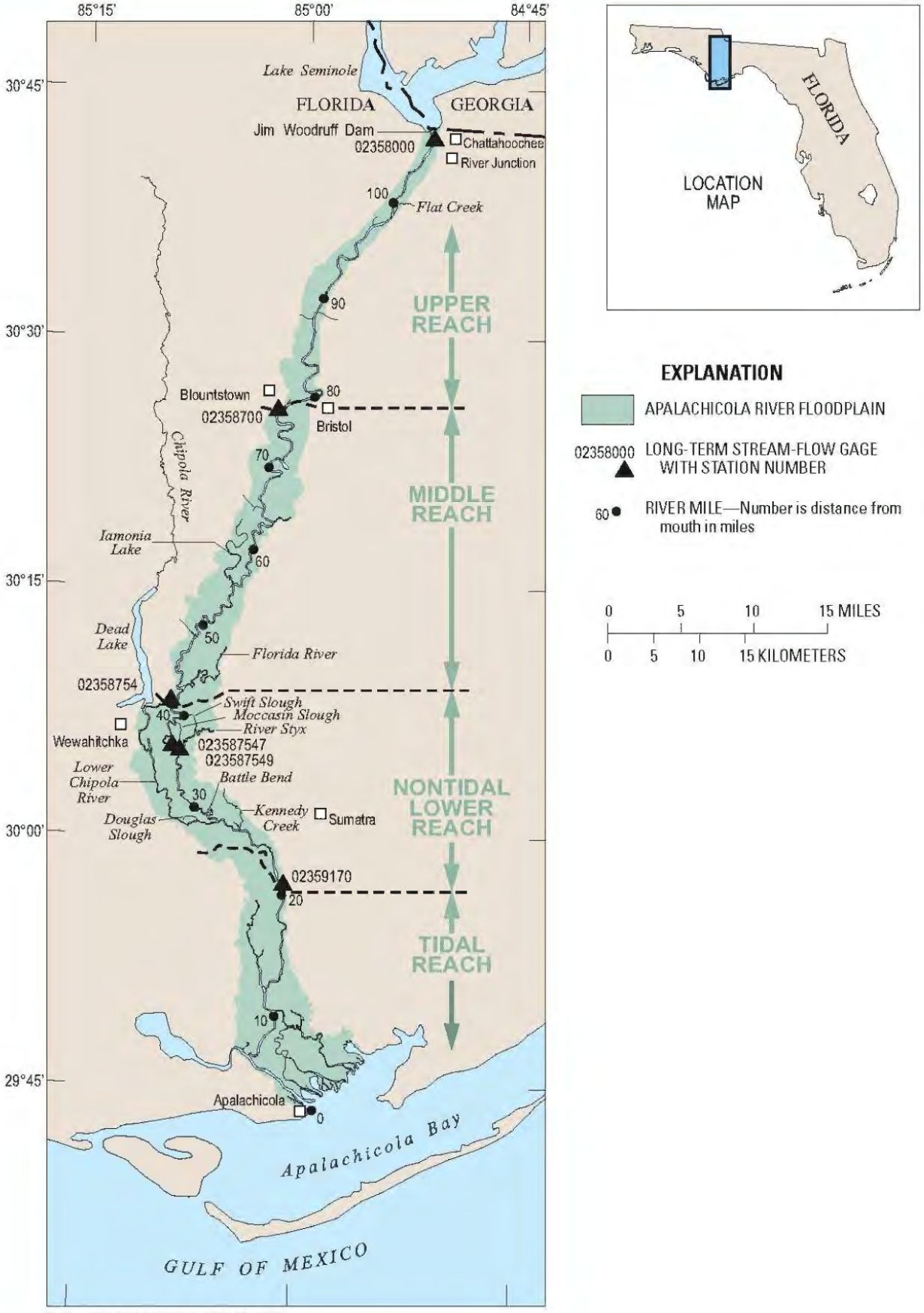
622	**2016-12-15**	**Trial Transcript Vol. XI – 11/17/16**
623	**2016-12-15**	**Trial Transcript Vol. XII – 11/18/16**
624	**2016-12-15**	**Trial Transcript Vol. XIII – 11/21/16**
625	**2016-12-15**	**Trial Transcript Vol. XIV – 11/22/16**
626	**2016-12-15**	**Trial Transcript Vol. XV – 11/29/16**
627	**2016-12-15**	**Trial Transcript Vol. XVI – 11/30/16**
628	**2016-12-15**	**Trial Transcript Vol. XVII – 12/1/16**
629	2016-12-15	GA's Post-Trial Brief
630	2016-12-15	FL's Post-Trial Brief
631	2016-12-15	United States' Post-Trial Brief as Amicus Curiae
632	2016-12-29	GA's Response to FL's Post-Trial Brief (re 630)
633	2016-12-29	FL's Response to GA's Post-Trial Brief (re 629)
634	**2017-1-3**	**Case Management Order No. 22**
635	2017-1-11	J. Neiman Letter to Special Master (re 634)

APPENDIX B


86°
85°
84°
83°
35°
34°
33°
32°
31°
30°
29°
GEORGIA
ALABAMA
SC
Lake Sidney Lanier
Buford Dam
Coosa River
Atlanta
Chattahoochee River
Oconee River
Ocmulgee River
Tallapoosa River
West Point Dam
Flint River
Columbus
Walter F. George Dam
Albany
Chattahoochee River
Choctawhatchee River
George W. Andrews Dam
ALA
FLA
Lake Seminole
Jim Woodruff Dam
GEORGIA
FLORIDA
Chipola River
Apalachicola River
Ochlockonee River
Tallahassee
Suwannee R.
Apalachicola Bay
GULF OF MEXICO
0
50 MILES
0
50 KILOMETERS
Base from U.S. Geological Survey digital data, 1972
Albers Equal-Area Conic projection
Standard Parallels 29°30' and 45°30', central meridian -83°00'
ALA
SC
GA
FLORIDA
LOCATION MAP
EXPLANATION
DRAINAGE BASIN OF THE APALACHICOLA, CHATTAHOOCHEE, AND FLINT RIVERS

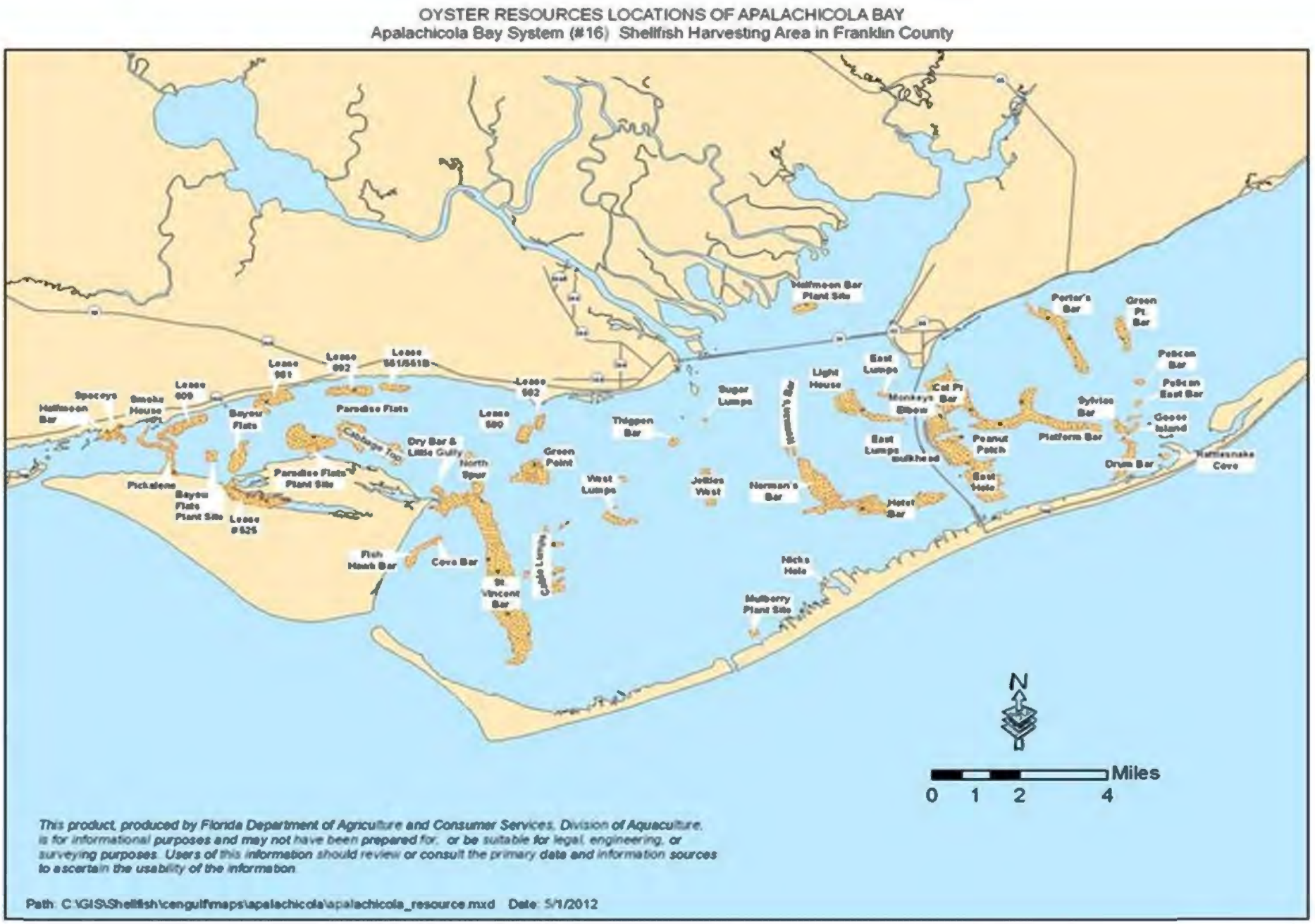

Apalachicola-Chattahoochee-Flint (ACF) River Basin
Gainesville
Lake Sidney Lanier
Buford Dam
Marietta
Morgan Falls Dam
Atlanta
Chattahoochee River
GEORGIA
Birmingham
West Point
Lock and Dam
La Grange
Langdale Dam
Riverview Dam
ALABAMA
Bartlett's Ferry Dam
Goat Rock Dam
Oliver Dam
Columbus
North Highlands Dam
Montgomery
City Mills Dam
Eagle & Phenix Dam
Flint River
Macon
Walter F. George
Lock and Dam
Blackshear Dam
Albany
Flint River Dam
George W. Andrews
Lock and Dam
Dothan
Bainbridge
Lake Seminole
Jim Woodruff Dam
Apalachicola River
Tallahassee
FLORIDA
LEGEND
Corps Lock and Dam Project
Dam Owned by Other Entity (i.e. Georgia Power)
Scale: 1:600,000
0 12.5 25 50 75 100
Miles
Apalachicola

APPENDIX D



Base from U.S. Geological Survey digital data, 1972
Albers Equal-Area Conic projection
Standard Parallels 29°30' and 45°30', central meridian -83°00'

APPENDIX E


OYSTER RESOURCES LOCATIONS OF APALACHICOLA BAY
Apalachicola Bay System (#16) Shellfish Harvesting Area in Franklin County
Halfmoon Bar Plant Site
Porter's Bar
Green Pt Bar
Pelican Bar
Pelican East Bar
Goose Island
Rattlesnake Cove
Drum Bar
Platform Bar
Sylvias Bar
Cat Pt Bar
Monkeys Elbow
East Lumps
Light House
Sugar Lumps
Lease 602
Lease 601
Lease 601/601B
Lease 609
Spoonys
Halfmoon Bar
Smoke House Pt
Bayou Flats
Paradise Flats
Lease 600
Thigpen Bar
Dry Bar & Little Gully
Cabbage Top
North Spur
Green Point
West Lumps
Julias West
Normans Bar
Peanut Patch
East Hole
Hotel Bar
Pickalene
Bayou Flats Plant Site
Paradise Flats Plant Site
Lease #625
Fish Hawk Bar
Cove Bar
St Vincent Bar
Nicks Hole
Mulberry Plant Site
N
Miles
0 1 2 4
This product, produced by Florida Department of Agriculture and Consumer Services, Division of Aquaculture, is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.
Path: C:\GIS\Shellfish\cengulfmaps\apalachicola\apalachicola_resource.mxd Date: 5/1/2012

APPENDIX F

UNITED STATES SUPREME COURT

Florida v. Georgia
No. 142, Original
Witness List

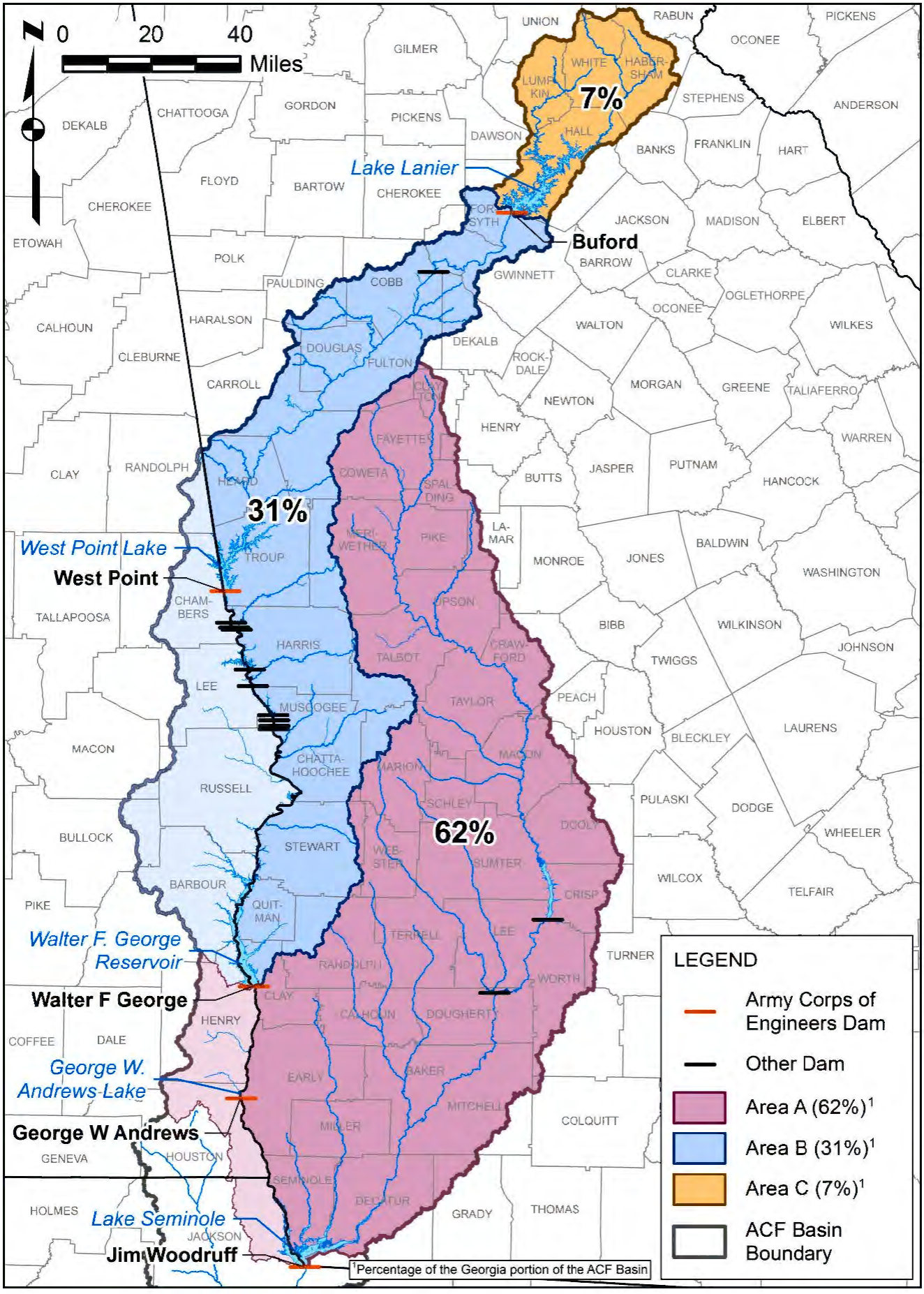
Case Name: Florida v. Georgia Case No.: No. 142, Original	Proceeding Type: Trial
Special Master: Ralph I. Lancaster, Jr.	
Courtroom Deputy: Devon F. Richards	
Court Reporter: Claudette Mason	
Florida's Attorneys: Phillip J. Perry, Esq. Jamie L. Wine, Esq. Abid Qureshi, Esq. Christopher Fawal, Esq. Matt Leopold, Esq. Paul Singarella, Esq.	Georgia's Attorneys: Craig Primis, Esq. Barack Echols, Esq. Winn Allen, Esq. Devora Allon, Esq. Karen DeSantis, Esq. Zachary Avallone, Esq. Emily Merki, Esq. Josh Mahoney, Esq.

FL	GA	Date	**WITNESS**
X		10/31/16	Jonathan Paul Steverson
X		10/31/16	Video Deposition – Napoleon Caldwell
X		10/31/16 & 11/1/16	Theodore S. Hoehn
X		11/1/16	David B. Struhs
X		11/1/16	Video Deposition – Judson Turner

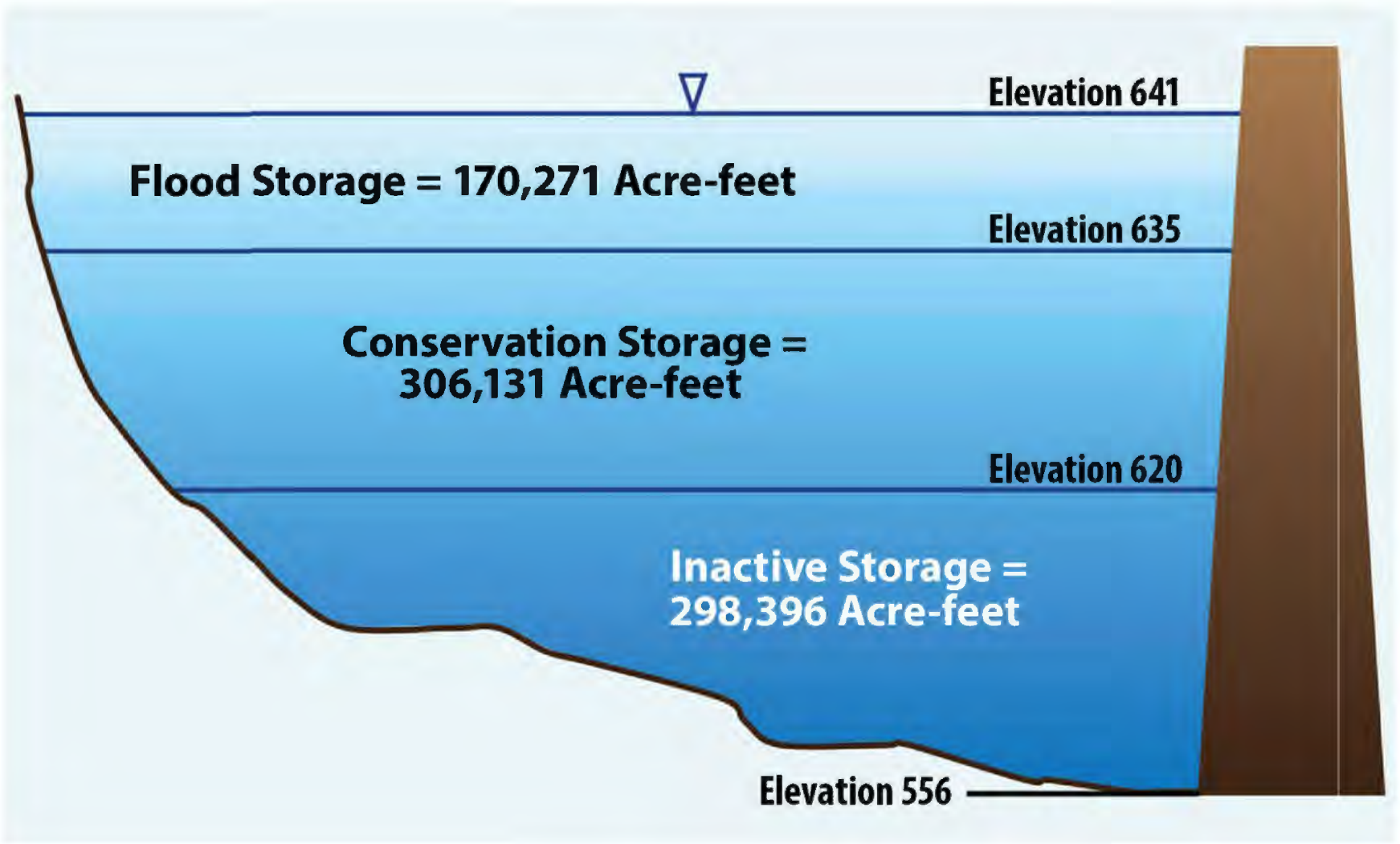
X		11/1/16 & 11/3/16	Dr. John David Allan
X		11/3/16	Harold F. Reheis
X		11/3/16 & 11/4/16	Mark Berrigan
X		11/7/16	Robert Beaton
X		11/7/16 & 11/8/16	Phillip Eric Sutton
X		11/8/16	Dr. David L. Kimbro
X		11/9/16	Dr. James Willson White, III
X		11/9/16	Dr. Marcia Greenblatt
X		11/9/16	Thomas Ward
X		11/9/16	Dr. Patricia M. Glibert
X		11/10/16	Dr. George Hornberger
X		11/10/16	Brett Cyphers
X		11/14/16	Video Deposition – Jason Wisniewski
X		11/14/16	Dr. Gail Cowie
X		11/16/16	Dr. Dennis Lettenmaier
X		11/16/16	Dr. Peter Shanahan
X		11/16/16 & 11/17/16	Dr. George M. Kondolf
X		11/17/16	Dr. David Sunding
	X	11/18/16	Judson Turner
	X	11/18/16	Dr. Carol Couch
	X	11/21/16	Dr. Wei Zeng
	X	11/21/16	Anna K. Kirkpatrick
	X	11/22/16	Peter Mayer
	X	11/22/16	Mark Masters
	X	11/29/16	Dr. Sorab Panday

	X	11/29/16	Dr. Philip Bedient
	X	11/30/16	Video Deposition: Steven Leitman
	X	11/30/16	Dr. William McAnally
	X	11/30/16	Dr. Charles Menzie
	X	12/1/16	Video Deposition – Dr. Bill Pine
	X	12/1/16	Video Deposition – Dr. Karl Havens
	X	12/1/16	Dr. Romuale Lipcius
	X	12/1/16	Dr. Robert Stavins
X		On the papers	Dr. Steven Scyphers
	X	On the papers	Dr. Robin Cantor

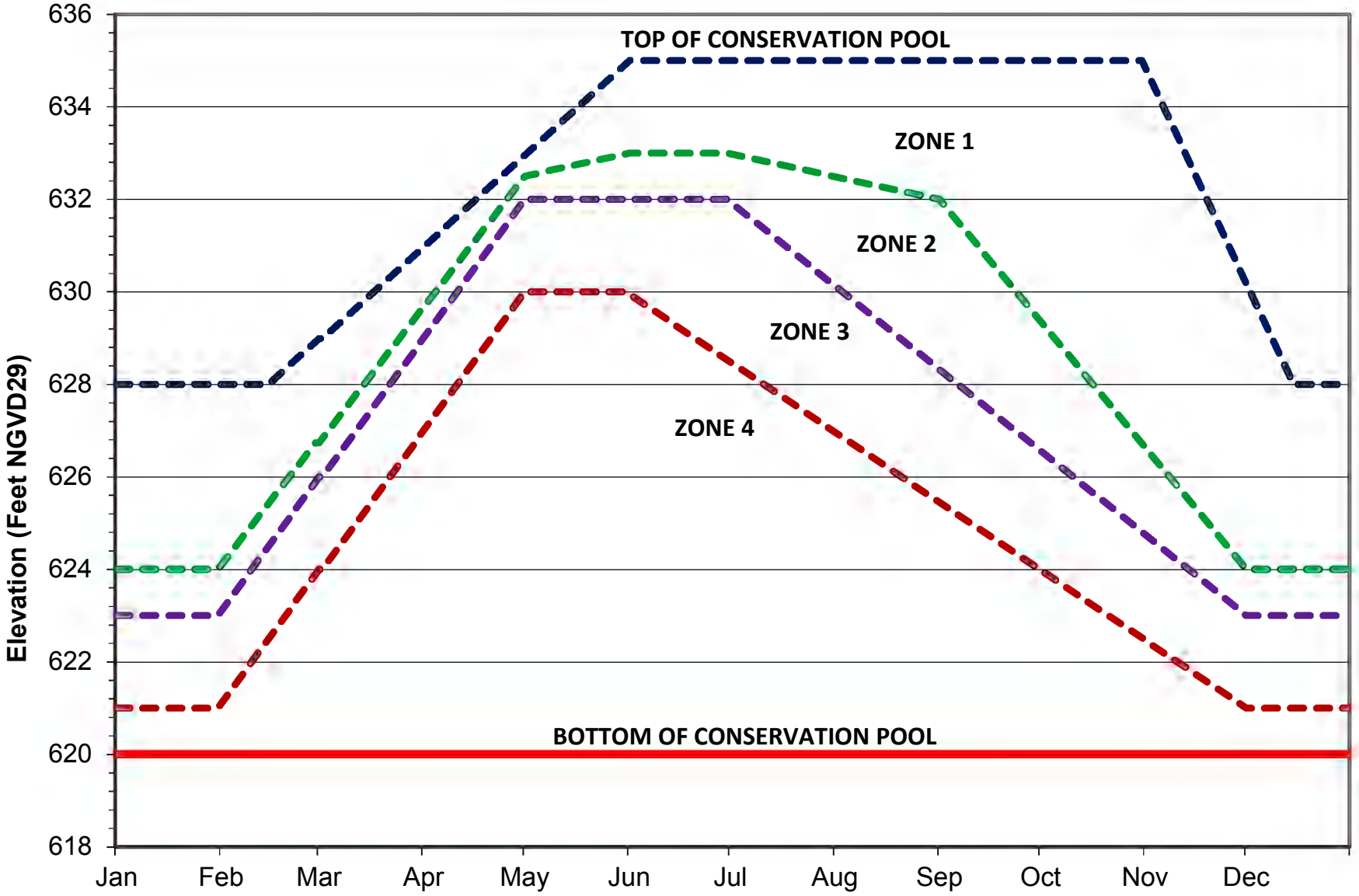
APPENDIX G


N
0
20
40
Miles
7%
31%
62%
Lake Lanier
Buford
West Point Lake
West Point
Walter F. George Reservoir
Walter F George
George W. Andrews Lake
George W Andrews
Lake Seminole
Jim Woodruff
LEGEND
Army Corps of Engineers Dam
Other Dam
Area A (62%)[1]
Area B (31%)[1]
Area C (7%)[1]
ACF Basin Boundary
[1]Percentage of the Georgia portion of the ACF Basin

APPENDIX H


Elevation 641
Flood Storage = 170,271 Acre-feet
Elevation 635
Conservation Storage =
306,131 Acre-feet
Elevation 620
Inactive Storage =
298,396 Acre-feet
Elevation 556

APPENDIX I


636
634
632
630
628
626
624
622
620
618
Elevation (Feet NGVD29)
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
TOP OF CONSERVATION POOL
ZONE 1
ZONE 2
ZONE 3
ZONE 4
BOTTOM OF CONSERVATION POOL

APPENDIX J

STATE OF FLORIDA

v.

STATE OF GEORGIA

No. 142, Original

[PROPOSED] DECREE

The Court having exercised original jurisdiction over this controversy between two sovereign States; the issues having been tried before the Special Master appointed by the Court; the Court having received briefs and heard oral argument on the parties' exceptions to the Report of the Special Master; and the Court having issued its Opinion announced in ___ S. Ct. ___ (____), IT IS HEREBY ORDERED, ADJUDGED, DECLARED AND DECREED AS FOLLOWS:

(a) For the reasons fully set forth in the Special Master's Report, we conclude that Florida has not proven by clear and convincing evidence that a decree imposing a cap on Georgia's consumptive water use would result in additional streamflow in Florida at a time that would provide a material benefit to Florida. Accordingly, we ADOPT the Special Master's recommendation and DENY Florida's request for relief.

(b) The party States shall share equally in the compensation of the Special Master and his assistant, and in the costs of this litigation incurred by the Special Master.