No. 142, Original

In the

Supreme Court of the United States

STATE OF FLORIDA,

Plaintiff,

v.

STATE OF GEORGIA,

Defendant.

Before the Special Master

Hon. Paul J. Kelly Jr.

STATE OF FLORIDA'S OPENING POST-REMAND SUPPLEMENTAL BRIEF

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INTRODUCTION AND SUMMARY OF ARGUMENT

At its core, Florida's case is straightforward. The Apalachicola Region is one of the nation's most unique, diverse, and irreplaceable environmental resources, and, until recently, home to one of its most iconic oyster fisheries. As Georgia has drastically increased its consumption of upstream waters, especially along the Flint River for agricultural purposes, the amount of water flowing into the Apalachicola has shrunk dramatically. This has had the predictable effect: the Apalachicola has suffered and its oyster fisheries, in particular, have collapsed. The question now is whether Georgia's wasteful practices should be allowed to continue—and worsen—while the Apalachicola, its natural resources, and the communities that depend on them are decimated.

The extensive work done by Special Master Lancaster and the decision by the Supreme Court last June provide the framework for answering that question. After a five-week trial, Special Master Lancaster had no difficulty concluding that Georgia's "upstream water use" has been and continues to be "unreasonable," and that the Apalachicola Region has sustained "real harm" as a result of the decreased flow of water into Florida. Report of the Special Master (Lancaster Report) 30-34 (Feb. 14, 2017), Dkt. No. 636 (citing live trial witness testimony, Georgia documentary admissions, and other evidence). Underscoring the inequitable nature of Georgia's conduct, he also found that "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." *Id.* at 34. As explained below, there is no basis for second-guessing Special Master Lancaster on any of these critical factual points.

Nevertheless, on the novel question of whether the Army Corps of Engineers' (Corps') absence from this case prevents the Court from righting this wrong, Special Master Lancaster ultimately concluded that the Court was powerless to enter a decree because there was "no guarantee" that the Corps would not offset its effects. *Id.* at 69-70. On that single issue, the Supreme Court concluded, he was mistaken. The Court clarified that "'[u]ncertainties about the future' do not 'provide a basis for declining to fashion a decree.'" *Florida v. Georgia*, 138 S. Ct. 2502, 2526 (2018) (citation omitted). Instead, given the importance of "protect[ing] the equitable rights of a State," the equitable apportionment inquiry must rely on "[a]pproximation and reasonable estimates" to determine what relief is appropriate. *Id.* at 2527. Moreover, the Court added, "[t]he United States has made clear that the Corps will work to accommodate any determinations or obligations the Court sets forth [in any] final decree." *Id.* at 2526. Thus, Florida is entitled to relief if, under "reasonable predictions of future conditions," *id.* at 2514 (citation omitted), the benefits of a decree would substantially outweigh its costs.

The evidence overwhelmingly establishes that this balance favors Florida. On the benefits side, a decree capping Georgia's consumption would significantly increase the flow of water into the Apalachicola and restore the conditions in which the region survived and thrived for centuries. And on the costs side, much of this reduction in consumption could be accomplished simply by halting wasteful irrigation practices and sensibly limiting future irrigation in ways Georgia officials have themselves proposed and other States (including Florida) have long implemented. The profound impacts of destroying a treasured ecosystem and natural resources that Florida, the federal government, and others

have long sought to protect, and permanently altering the lives and livelihoods of the communities who rely upon these resources, clearly outweigh such costs.

The Apalachicola Region as it has been known for centuries is being destroyed by Georgia's ever-increasing consumption of waters to which it (just like Florida) has only a right to reasonable, not absolute, use. The Supreme Court's original jurisdiction exists so that the Court can equitably resolve, and thereby diffuse, exactly the sort of inter-State conflict that has precipitated this action. Under the principles established by the Supreme Court's decision in this very case, Florida has clearly shown that it is entitled to a decree that stems Georgia's wasteful practices.

ARGUMENT

I. THE SUPREME COURT'S DECISION ESTABLISHES THE EQUITABLE FRAMEWORK FOR RESOLVING THIS CASE

In its decision in this case, the Supreme Court went out of its way to distill and clarify the framework that applies in equitable apportionment actions. That framework governs the Special Master's consideration of this case on remand.

At the outset, the Supreme Court stressed that Georgia, like all States, has an "affirmative duty . . . to take reasonable steps to conserve and even to augment the natural resources within [its] borders for the benefit of other States," including Florida. *Florida v. Georgia*, 138 S. Ct. at 2513 (quoting *Idaho ex rel. Evans v. Oregon*, 462 U.S. 1017, 1025 (1983) (*Idaho II*)); *see also Colorado v. New Mexico*, 459 U.S. 176, 185 (1982) (*Colorado I*). The Court further recognized that, "[g]iven the laws of the States, both Georgia and Florida possess 'an equal right' to make a *reasonable use* of the waters [at issue]." *Florida v. Georgia*, 138 S. Ct. at 2513 (citation and some internal quotation marks omitted).

Under the doctrine of equitable apportionment, Florida is required to make, through the use of "clear and convincing evidence," "an initial showing of 'invasion of rights' and 'substantial injury.'" *Id.* at 2517; *see New Jersey v. New York*, 283 U.S. 336, 345 (1931). Once Florida makes that initial showing, the inquiry turns to an evaluation of the benefits a decree is likely to produce and any resulting harms from a decree. A decree is warranted wherever "the benefits of the [remedial decree] substantially outweigh the harm that might result." *Florida v. Georgia,* 138 S. Ct. at 2527 (quoting *Colorado I*, 459 U.S. at 187).

As the Supreme Court explained, "our cases, while referring to the use of a 'clear and convincing' evidentiary standard in respect to an initial showing of 'invasion of rights' and 'substantial injury,' have never referred to that standard in respect to a showing of 'remedy' or 'redressability.'" *Florida v. Georgia*, 138 S. Ct. at 2517 (citation omitted). Instead, the Court emphasized, when it comes to determining whether the future benefits of a remedy are worth their future costs, "[a]pproximation and reasonable estimates may prove 'necessary to protect the equitable rights of a State.'" *Id.* at 2527 (citation omitted).[1]

But even if the "clear and convincing" standard applied to all remaining aspects of the case, the result would be the same: The evidence here overwhelmingly shows that the

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[1] In arguing otherwise, Georgia has relied on dictum in *Colorado I* involving an "example" in which "equities supporting a diversion for future use in one state may justify the detriment to existing users in another state." 459 U.S. at 187; *see, e.g.*, Ga. Exceptions Resp. 3, 36. But *Colorado I*'s "example" by no means establishes that the "clear and convincing" standard must be met in the very different case here, where the party seeking relief is the party seeking to *prevent* diversions rather than the party seeking to make them. And to the extent that *Colorado I* left any uncertainty on the point, the Supreme Court's decision *in this case* has definitively clarified that the heightened showing is not required at this stage. *See Florida v. Georgia*, 138 S. Ct. at 2517 (stating that "our cases . . . have never referred to that standard in respect to a showing of 'remedy' or 'redressability'").

benefits of a decree would substantially outweigh any costs that the decree would entail, and that Florida is therefore entitled to an equitable apportionment.

II. FLORIDA IS ENTITLED TO A DECREE UNDER THE FRAMEWORK THE SUPREME COURT SET FORTH IN ITS DECISION

Case Management Order No. 25, as amended, set forth seven questions (with subparts) that the Special Master would like to answer. Florida addresses each of those questions below under the framework set forth in the Supreme Court's opinion.

A. Florida Has Suffered A Substantial Invasion Of Rights Of A Serious Magnitude Resulting From Decreased Flows In The Apalachicola River Caused By Georgia's Consumption (Questions 1 & 2(a))

The Apalachicola Basin—which includes the River and Bay—is home to one of the most diverse and unique river and estuarine ecosystems in the United States. *See* Lancaster Report 8-10; Steverson Pre-Filed Direct Test. (PFD) ¶¶ 9-10; FX-675 (video), https://www.youtube.com/watch?v=E7v1a9BLXW4. As recognized by the United Nations itself in designating the Apalachicola Basin a Biosphere Reserve, the area has historically supported extraordinary animal and plant species diversity and is "home to the highest species density of amphibians and reptiles in all of North America." Lancaster Report 8; *see also* Steverson PFD ¶¶ 9, 31; FX-154. More than that, it also supports a distinct way of life for families that have fished its waters and lived off its bounty for centuries. Lancaster Report 9-10; Steverson PFD ¶ 10.

The Apalachicola River and its associated floodplain—which spreads miles from the River—contains a network of tributaries, swamps, and "sloughs," which are natural channels connected to and fed (in ordinary conditions) by the River. Lancaster Report 7-8. Among other things, the River and floodplain have been habitat for the threatened Gulf

sturgeon, as well as 142 freshwater and estuarine fish species; host for 26 species of freshwater mussels; and support one of the largest stands of Ogeechee Tupelo and other swamp tree species in the country. *Id.*; Allan PFD ¶¶ 12-15; Hoehn PFD ¶¶ 22-26, 30-32. The area is also a haven for fishing. *See* Hoehn PFD ¶¶ 34, 36; Allan PFD ¶ 12.

The Apalachicola River delivers its waters and essential nutrients to the Apalachicola Bay, where the mixture of nutrients, fresh water, and salt water forms "one of the most productive estuaries in the northern hemisphere." Lancaster Report 8-9. Historically, the Bay has offered "an 'ideal' place for oysters to thrive, . . . producing ninety percent of Florida's oyster harvest and ten percent of the nation's oyster harvest." *Id.* at 9. Apalachicola oysters are "widely recognized for their quality," and "a distinctive culture and fishery [has been] built around the harvesting of oysters by hand from small boats." *Id.* at 9-10. The Bay is also "a major fishery resource for . . . shrimp[] and finfish," and the harvesting of oysters, shrimp, crab, and fish in the Bay "is the primary economy in the Apalachicola Region" and has fostered "a distinctive culture." *Id.* at 8-10; *see also* FX-66 at GA00055244 (discussing productivity of the Bay).

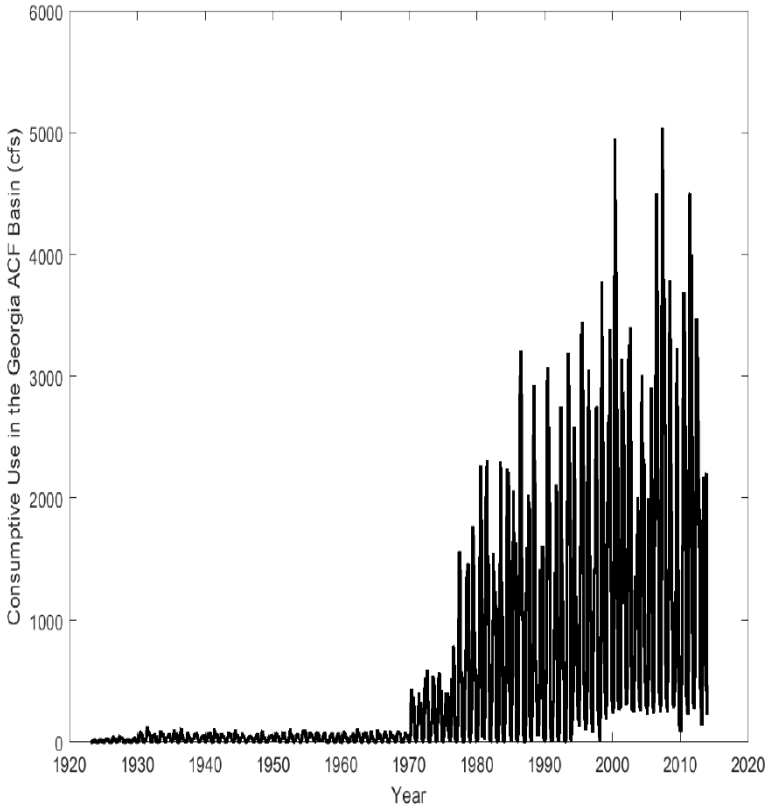
Recognizing that the Apalachicola Basin is a state and national treasure, Florida has strived mightily to protect and preserve it. Since 1965, the State has invested nearly half a billion dollars (in 2014 dollars) to conserve more than 340,000 acres in the Basin by purchasing land parcels in fee simple or acquiring conservation easements. Steverson PFD ¶¶ 16, 19 (map); FX-144 (containing list of purchased land). Non-profits and the federal government have joined in, setting aside more than 500,000 additional acres for conservation. Steverson PFD ¶¶ 18, 19. Florida has also spent considerable sums to restore

related land holdings, such as Tate's Hell State Forest, which contains 202,436 acres of land that drains into Apalachicola Bay. Steverson PFD ¶ 30. And in addition to those massive expenditures, Florida has adopted numerous legal measures to provide the highest protection against degradation of water quality in the region. Steverson PFD ¶ 33; *see also* Fla.'s Post-Trial Br. 61-65 (Dec. 15, 2016), Dkt. No. 630 (describing additional Florida actions to ensure adequate water flows and quality in the River and Bay).

But while Florida has spent the last half-century actively working to preserve and protect the precious resources and character of the Apalachicola River and Bay, Georgia has taken the opposite course—repeatedly acknowledging the urgent need for a solution preserving natural resources both in Georgia and Florida but nevertheless (at the same time) expanding significantly its destructive consumptive uses of water.

1. *Georgia's Increases In Water Consumption Have Stifled Water Flows Into The Apalachicola River*

As the following chart illustrates, Georgia's consumptive use of water in the Apalachicola region has skyrocketed since the 1970s, largely due to "[a]gricultural irrigation," especially in the Flint River Basin (Lancaster Report 32):

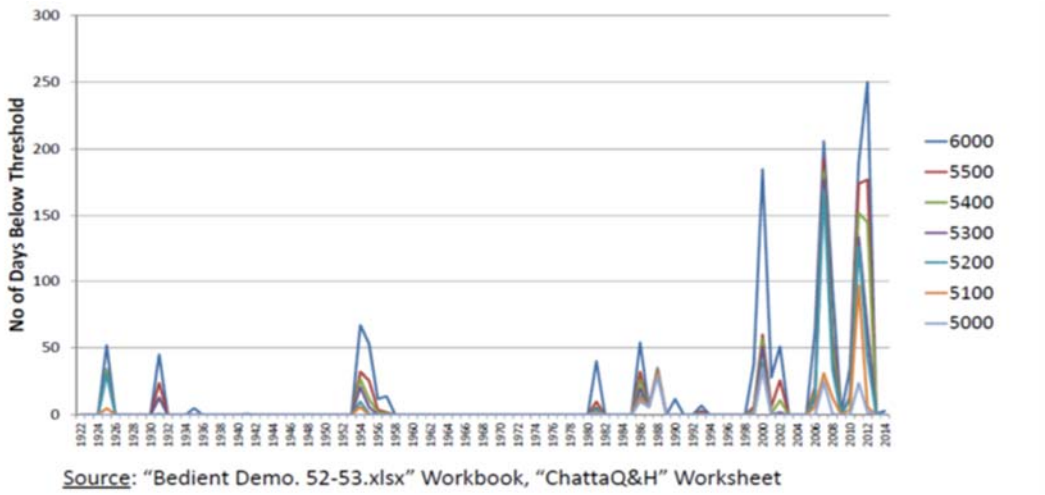


Hornberger PFD at 37, fig. 7; *see also id*. ¶¶ 77, 79, fig. 8.

With Georgia consuming far more water, far less flows to Florida, especially during dry and drought periods. Historical flow gage measurements starkly illustrate this. The "Chattahoochee" gage, which the U.S. Geological Survey (USGS) has used to record flows entering the Apalachicola River from Lake Seminole since 1928, shows an unmistakable pattern. Flows began to fall in the 1970s and 1980s as Georgia increased its irrigation efforts, then plummeted in the 1990s and thereafter. Hornberger PFD ¶¶ 42-65. In the 72 years of recorded data before the year 2000, flow at the Chattahoochee gage very rarely dropped below 6,000 cubic feet per second (cfs), even during the worst drought periods in the history of the Apalachicola-Chattahoochee-Flint River Basin (the "ACF Basin"). FX-D-1 (USGS gage record for Chattahoochee gage, highlighting months with average flows

below 6,000 cfs). But since 2000, average monthly flows in dry, drought, and even normal precipitation years are substantially lower, falling and remaining below 6,000 cfs on average for weeks or months at a time, year after year, including in moderate, dry, and drought periods in 2000, 2001, 2002, 2006, 2007, 2008, 2010, 2011, and 2012. *Id.*

The following graph—from Georgia's own hydrology expert—starkly depicts this increased frequency of severe low flows, the most destructive periods:



FX-D-17. Flows at the Florida border were persistently below 6,000 cfs for *fourteen* months in 2011 and 2012 (including almost every month from May through December of both years), and for *thirty-four* total months between 1999 and 2012, including even in certain months in years where Georgia did not declare a climatic drought (e.g., 2006 and 2010). FX-D-1; Hornberger PFD ¶ 46; GX-141. In the forty years from 1930 to 1970, by contrast, USGS had recorded only *six* months—total—in which average flow on the Apalachicola near the Georgia border fell below 6,000 cfs. FX-D-1.

Other measures likewise demonstrate the effects Georgia's consumption has had on state-line flows. Florida's hydrology expert, Dr. Hornberger, demonstrated that "basin

yield"[2] has fallen substantially in the Georgia portion of the ACF Basin. Hornberger PFD ¶ 64 & table 4. The four years with the lowest basin yield at the state line in recorded history are 2012, 2002, 2000, and 2008. *Id.* ¶ 65, table 5. When Dr. Hornberger translated those reductions into river flow figures, the results were dramatic: between 2003 and 2013 (which included a mix of drought and non-drought years), flow into the Apalachicola River was on average *3,900 cfs lower* than it would have been under pre-1970s basin yields. *Id.* ¶ 64, table 4. The only potential explanation for these losses is increasing consumptive water use in Georgia's portion of the ACF, and related impacts on the Upper Floridan aquifer. *See* Hornberger Tr. Test. (vol. 8) 1970:13-23, 2096:14-21; Hornberger PFD ¶ 3(a).

2. *Reduced Flows During Key Periods Have Devastated The Apalachicola Bay And River*

Prolonged flow reductions of that magnitude—a single day of 3,900 cfs flows would be enough to cover more than 7,500 acres with a foot of water—inevitably have consequences. As Special Master Lancaster observed, "[t]here is little question that Florida has suffered harm from decreased flows in the River." Lancaster Report 31.

The harm to the oyster fisheries of Apalachicola Bay is especially striking. After centuries of surviving drought, hurricanes, and other severe climatological events, the Bay suffered an "unprecedented collapse of its oyster fishery in 2012." *Id.* at 31-32 (citing Berrigan PFD ¶¶ 26-31; Ward PFD ¶¶ 24-29, 42). "[O]yster mortality reached devastating levels, leaving many previously-productive oyster reefs virtually empty." *Id.* "As

[2] "Basin yield" reflects the amount of river flow generated by an inch of rain in the region, allowing hydrologists to isolate the effects of increased consumption from other potential causes of reduced flows (such as reduced precipitation).

explained by Florida's expert, Dr. David Kimbro, and as the National Oceanic and Atmospheric Administration ('NOAA') concluded . . . , the oyster collapse came as a result of increased salinity in the Bay caused by low flows in the River," and not—as Georgia has claimed—overharvesting of oysters. *Id.* at 31-32 (citing Kimbro PFD ¶¶ 4, 101; Sutton PFD ¶ 48; FX-413 at NOAA-22896-97; FX-412 at NOAA-3818; Berrigan PFD ¶¶ 36-49).

While the collapse of the oyster fisheries was "unprecedented," *id.* at 31, the climatic conditions preceding it were not. Although 2011 and 2012 were drought years, the area had seen comparable (or worse) droughts in the past with no comparable effects on the Bay. *See* Hornberger PFD ¶¶ 50-53. For example, the 1931 drought was more severe in both rainfall and temperature than either 2011 or 2012, but the summer flows on the Apalachicola River in 1931 were approximately 3,600 cfs more than in 2011 and 3,700 cfs more than in 2012. *Id.* ¶ 53 & table 2. The *extended* drought period in 2011-2012 was not unique, either: The drought in 1954-55, for example, was more severe, yet produced nothing like the 2012 oyster crash. *See id.* ¶¶ 50-52 & table 1; Sutton PFD ¶¶ 59, 66; Berrigan Tr. Test. (vol. 4) 1012:24-1013:9; Glibert Tr. Test. (vol. 7) 1863:12-1863:16. Instead, the distinguishing feature of the 2012 crash was the persistent, extreme low flows that preceded it—due to Georgia's upstream consumption (*supra* at 7-10). Lancaster Report 32; FX-413 at NOAA-22895-97; Kimbro PFD ¶¶ 4, 7.

Reducing the fresh water flowing into the Bay increases salinity there, and the evidence shows that even relatively small changes in salinity have the potential to cause significant harm if prolonged over many months or years. Glibert PFD ¶¶ 4, 64, 71, 81-83; Glibert Tr. Test. (vol. 7) 1830:17-1831:13, 1867:24-1870:12; Menzie Tr. Test. (vol. 16)

4185:20-4186:7, 4187:19-4188:3; FX-379 at 11; FX-789 at 67 (showing significant increasing salinity trend from 2002-2012 at most locations in the Bay). Certain Bay species are highly sensitive to salinities, especially in East Bay, which serves as a nursery and refuge for species and which experienced particularly impactful changes in salinity. JX-122 at 34; FX-379 at 5-6; Glibert PFD ¶¶ 13, 16, 18; Kimbro PFD ¶ 29; FX-797 (Kimbro Expert Report) at 2; Greenblatt PFD ¶ 4; Glibert Tr. Test. (vol. 7) 1867:24-1870:12; Kimbro Tr. Test. (vol. 6) 1570:24-1572:2. As the U.S. Fish and Wildlife Service has found, even a 1 part-per-thousand (ppt) increase in median salinity in East Bay "may exceed salinity thresholds for juvenile Gulf Sturgeon and oysters." JX-122 at 34.

Low flows also reduce the nutrients reaching the Bay from the Apalachicola floodplain, disrupting the food chain—from the plankton at the base to the fish and crabs up the chain—and impacting key food sources, including submersed aquatic vegetation. Glibert PFD ¶¶ 4, 16-18 & fig. 5, 22, 28, 30-31, 39, 57, 64, 68-72, 83; Glibert Tr. Test. (vol. 7) 1826:10-13;1831:8-17; FX-379 at 2, 11, 28-33, 54-55, 65, 74-75. With persistent low flows, the combined nutrient and salinity effects decrease productivity of estuarine species that have traditionally thrived in the Bay. Glibert PFD ¶¶ 4-5, 22, 68-72, 81-82.

To make matters worse, increasing the salinity of the Bay created a more marine (saltwater) system in which saltwater predators thrived—and decimated estuarine species. Witnesses described the influx of predators in the Bay (conchs) as something out of a "science fiction movie."[3] *See also* Berrigan PFD ¶ 44 ("In all my [30 years of] experience,

[3] *See* Fla. Opening Statement Presentation at 42-43 (citing photographic evidence, quoting Berrigan Dep. 161:13-162:1); Berrigan PFD ¶¶ 26-31, 43-46; Kimbro PFD ¶¶ 4, 99 & fig.

I had never encountered such an abundance of [predators] or the devastation they left behind."); *id.* ¶¶ 36-43, 45, 62-63. Tommy Ward, an Apalachicola oyster fisherman and lease-holder for more than 30 years, testified that "[i]t used to be common to harvest hundreds of oysters and maybe find one conch. Now, there's probably 100 conchs for every oyster." Ward PFD ¶ 5; *see also* Ward Tr. Test. (vol. 7) 1808:2-10. Even Georgia's expert, Dr. Lipcius, ultimately acknowledged at trial that saltwater predators were impacting the oyster population. Lipcius Tr. Test. (vol. 17) 4406:19- 4407:8, 4414:8-14.

And it is not just the Bay. The Apalachicola River is likewise highly sensitive to low flows—and has seen disastrous effects from the persistent extreme low flows that Georgia's consumption has caused. When flows on the River are reduced, floodplain ecosystems are cut off, receiving little or no fresh water and causing aquatic life to die if higher flows do not resume quickly. Allan PFD ¶¶ 3(a)-(f), 23, 27-30, 39, 43-60, 93-96; JX-168 (2016 BiOp) at 50; Hoehn PFD ¶¶ 37-56; Hoehn Tr. Test. (vol. 2) 278:25-280:16, 293:23-295:1. Florida's expert, Dr. Allan, testified to the "importance of the enormous range of aquatic habitats that occur throughout the network of sloughs and the floodplain surrounding the River" and of "microhabitats in the River (bank margins, pools, submerged wood, locations of different current speeds)," which Dr. Allan testified "are very sensitive to even modest changes in water levels." Allan PFD ¶¶ 11, 20.

2; Ward PFD ¶ 5; Glibert PFD ¶¶ 4-5, 27, 81-84; FX-412 at NOAA-3818; JX-50 at 4; FX-413 at NOAA-22897 (NOAA determination that "the physical (high salinity) and biological (increased predation and natural mortality) environmental issues have played a more central role in the declines to the oyster stock in this area").

The Basin ecosystem can survive and function if low flows happen occasionally and for short periods, but as Dr. Allan testified, many of the River and floodplain species cannot survive persistent low flows below 6,000 cfs. *See, e.g.*, Allan PFD ¶¶ 26-27, 32, 44-45. Dr. Allan explained, for example, that stranding of mussels occurs at levels below 10,000 cfs and becomes common at 6,000 cfs. *Id.* ¶¶ 43-44. In just one example from 2006, when a slough became disconnected from the River for an extended period, over 95 percent of the 18,000 endangered fat threeridge mussels within the slough died. *Id.* ¶¶ 27, 45 & fig. 18. At trial, Florida presented stark evidence of such episodes. *See id.* at figs. 1, 17, 18 (photographic evidence showing disconnected sloughs and stranded mussels).

Low flows have other pernicious effects in the River, too. Swamp forests are not flooded, and salinity intrudes further into the River's tidal reach. Allan PFD ¶¶ 23, 29-30, 32, 54, 60-61. As a result, fish and mussel species, as well as tupelo and other swamp trees, die and are harmed through reduction in habitat, resulting in smaller and weaker populations. *Id.* ¶¶ 38-61. The threatened Gulf sturgeon, for example, is particularly sensitive to changes in flow because young-of-year sturgeon cannot tolerate high salinities in the lower tidal region of the Apalachicola River, and rely upon adequate flows to mix surface and bottom waters. *Id.* ¶¶ 53-54. And the iconic Ogeechee tupelo forests of the Apalachicola are especially vulnerable to flows changes as well: Between 1976 and 2004, the low flows in the Apalachicola River cut the number of Ogeechee tupelo trees in the region nearly in half. Allan PFD at fig. 22.

No wonder that Special Master Lancaster, having presided over the trial, observed that the "evidentiary hearing made clear[] [that] Florida points to real harm." Lancaster

Report 31. That harm is exactly the sort of invasion of rights that original actions exist to address. Indeed, in *New Jersey v. New York*, the Special Master specifically relied on harm to the "oyster industry" (along with harm to "recreational uses") in entering a decree. Report of the Special Master 193, *New Jersey v. New York*, 283 U.S. 336 (1931) (No. 16, original) (finding that proposed diversion by New York would cause only slight injury to most of New Jersey's interests but "more than slight damage to the recreational uses of the river and the oyster industry"). The Supreme Court affirmed the Special Master's analysis and finding of injury. *New Jersey v. New York*, 283 U.S. at 345. As the evidence overwhelmingly demonstrates, the injury inflicted on Florida as a result of Georgia's upstream consumption far exceeds the invasion of rights in *New Jersey*.

3. *Georgia's Attempts To Downplay Its Own Consumption, And To Blame The Devastation In The Apalachicola Region On Other Causes, Are Unpersuasive*

Because it is clear that Florida has suffered substantial injuries of the sort that warrant imposition of an equitable decree, Georgia's strategy throughout this litigation has been to try to minimize the role that its runaway consumption has played in causing those injuries, while pointing the finger at anyone and anything else it can think of—the climate, Florida's own oyster fishermen, decades-old dredging activities, and so on. The evidence, however, overwhelmingly refutes Georgia's efforts to shift the blame.

a. *Georgia Grossly Underestimates Its Own Consumption*

Georgia has repeatedly argued it cannot have caused streamflow reductions on the magnitude of 3,900 cfs, because its "*total* consumptive water use in the Basin has never reached a monthly average of 2,000 cfs, and has exceeded 1,400 cfs only during the most

extreme drought months." Ga.'s Reply to Fla.'s Exceptions 18, *Florida v. Georgia*, 138 S. Ct. 2502 (filed July 31, 2017) [hereinafter "Ga. Exceptions Resp."]. But that argument depends upon a dataset its own University scientists have deemed unreliable.

Georgia's Water Resources Institute (GWRI), a segment of the Georgia Institute of Technology, authored an evaluation in 2012 addressing the State's data on water consumption, including consumption in the Flint Basin. *See generally* FX-534. GWRI concluded that the "Unimpaired Flow (UIF) Dataset"—including Georgia's consumption data—contains systematic errors. *See id.* at iv-v, 10, 189-94. Unless corrected, GWRI observed, the data could *substantially undercount* the consumption of Georgia's agricultural irrigation by "up to 70% of the actual crop water requirement." *Id.* at 10. GWRI also noted that the consumption data failed to account for evaporation from thousands of farm irrigation ponds, which could result in additional consumptive water losses of up to 1,200 cfs. *Id.* at 191; *see also* Hornberger PFD ¶¶ 77, 81 (estimating 20,000 small impoundments in the Georgia ACF, including farm ponds); JX-45 at 45 (benchmark for farmers to "reduce water loss from 50% of all farm ponds used for agricultural irrigation"). The ACF Stakeholders, an organization that included key personnel from Georgia water planning districts, likewise identified the need to correct the "systematic errors" in the UIF data. *See* FX-883 at 86, 126. Georgia thus knew of the errors in the UIF dataset since at least 2012, but refused to pay researchers to conduct the work necessary to fix them, perhaps recognizing that the answer would not be helpful to its cause. *See* Turner Tr. Test. (vol. 12) 2953:12-2954:21; Zeng Tr. Test. (vol. 13) 3210:21-3211:2. Instead,

Georgia relied extensively on this flawed data at trial. *See, e.g.*, Bedient Tr. Test. (vol. 15) 3968:1-9, 3970:8-3972:20, 3976:2-7.

Meanwhile, in the absence of corrections to the data, GWRI explained that a reliable way to assess the effects of Georgia's consumptive use would be to employ rainfall-runoff models calibrated based on early hydrologic periods when consumptive use effects were negligible. *See* FX-534 at 193. Florida's experts did precisely that: Using a rainfall runoff model (Precipitation Runoff Modeling System, developed by USGS), Dr. Hornberger found consumptive uses by Georgia of up to roughly 4,000 cfs on average in summer months of recent dry and drought years. Hornberger PFD ¶¶ 27, 86-88, 93-95 & table 8. Another Florida expert, Dr. Lettenmaier, independently ran a different rainfall runoff model—the Variable Infiltration Capacity model, developed at the University of Washington—and reached a similar conclusion, showing 3,800 cfs average annual Georgia depletions across all recent drought and non-drought years. Lettenmaier PFD ¶¶ 39-40; *see also* Hornberger PFD ¶ 91 & table 7 (describing similar conclusions regarding Georgia's ACF dry-year consumption by other independent researchers). Georgia, on the other hand, decided not to present any rainfall runoff modeling runs at trial.

b. *The Dramatic Fall In Flows Cannot Be Attributed To Change In Climate In The Region*

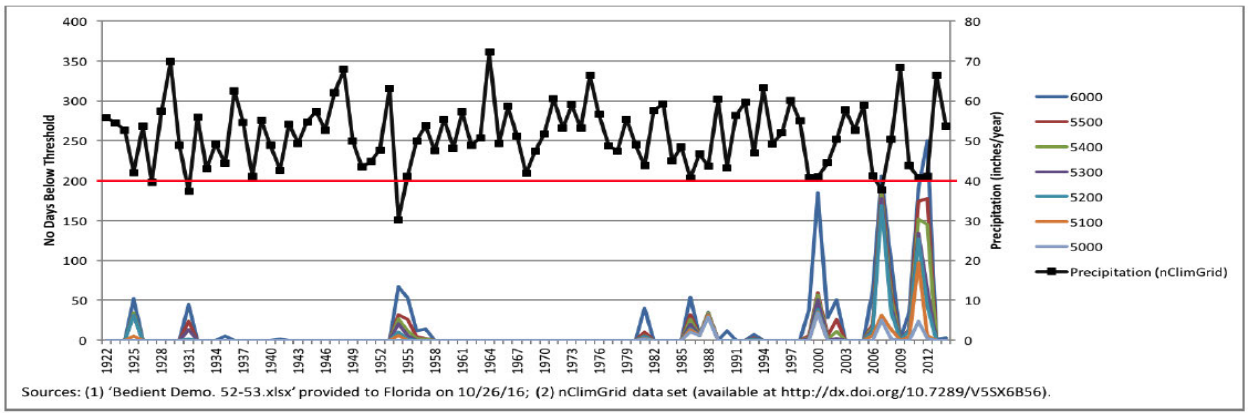
Because its consumption underestimates left it unable to explain where all the missing water was going, Georgia invented a new narrative—that "natural climatic changes, not Georgia's consumptive use, are driving the summer streamflow trends identified by Florida." Ga.'s Post-Trial Br. 78 (Dec. 15, 2016), Dkt. No. 629. But like its

consumption claims, that argument crumbled at trial: Georgia's internal documentation and State-funded studies, together with Florida's expert testimony, demonstrate that ACF rainfall patterns cannot account for the frequency and persistence of recent severe low flows. *See* JX-21 at 22 (analysis by Georgia's Environmental Protection Division (EPD)); FX-49d-1 at 27 (Georgia-funded study showing irrigation, and not change in climate, responsible for recent severe low flows); Lettenmaier Tr. Test. (vol. 10) 2446:23-2447:7, 2447:20-2448:4, 2448:17-2450:1 (discussing FX-893); Lettenmaier PFD ¶¶ 22-25.

Indeed, as the following chart illustrates, the number of extreme low flow days have skyrocketed, without any corresponding trend in precipitation:

FX-893

Number of Days With Flows at the Chattahoochee Gage (USGS 02358000) Below Certain Thresholds and Annual Precipitation Data



FX-893 (Lettenmaier demonstrative using FX-D-17).[4]

[4] *See also* Lettenmaier Tr. Test. (vol. 10) 2447:20-2448:4, 2448:17-2450:1 (describing how the number of days below 6,000 cfs flow "has just shot up during the recent drought" and concluding "[t]here is simply no way that you can explain that by the fact that the precipitation was here about 10 inches below the long-term average"); FX-49d-1 at 27.

c. *Florida's Injuries Are Not Caused By Sikes Cut, Dredging, Or Other Supposed Causes*

At trial, Georgia neither argued nor submitted evidence to suggest that Sikes Cut, a manmade inlet to the Bay created by the Corps several decades ago, might have affected salinity levels in portions of the Bay. Indeed, the evidence showed that Sikes Cut is very small: at 500 feet wide, which is less than 1 percent of the approximate 64,000 foot width of the Bay's deeper natural channels, it likely accounts for a very small percentage of tidal flows. *See* GX-871 at C-6. Any impact it could conceivably have on salinity would be minimal (at most) and localized to a very small part of the Bay directly adjacent to the inlet. *See id.* In 175 pages of post-trial briefing, Georgia never once discussed Sikes Cut.[5]

Georgia did, meanwhile, refer to river level changes brought about by the Corps' construction of dams in the 1950s and the Corps' subsequent dredging efforts. *See, e.g.*, Ga.'s Post-Trial Br. 39-43; Ga.'s Post-Trial Resp. Br. 43-45 (Dec. 29, 2016), Dkt. No. 632. But Georgia never made any meaningful attempt to show that those activities affected the Bay, confining its arguments from these supposed alternative causes to "[t]he River [e]cosystem." Ga.'s Post-Trial Br. 38. For good reason: The evidence showed that, while Georgia's reduction of water available to flow *through* the dams affects salinity, the dams *themselves* have no direct effect on it. JX-124 (Corps DEIS) at ES-1, 2-56 to 2-57. And

[5] Because Georgia made no argument at trial on this issue, none of the deposition evidence on it was admitted in rebuttal. For example, a Georgia Institute of Technology professor testified in his deposition that outside of some localized impacts, Sikes Cut does not "really impact . . . the overall distribution of salinity across the bay" and that closing Sikes Cut would not make "much of a difference." Georgakakos Dep. 549:9-551:13. If such evidentiary submissions would assist the Special Master, Florida will provide them.

in any event, the dams were initially filled long ago, and any impacts from initially filling the dams would have depressed flows to Florida temporarily during that time. But again, historic flows (even if depressed for a short period while dams were filled) were substantially higher in the past than during recent dry periods. *See supra* at 7-10.

As to the River, Florida's experts showed that: (1) the Corps' dredging activities and construction of dams were done for Georgia's benefit, Kondolf PFD ¶¶ 13-16; JX-1 at 1; FX-199 at FL-ACF-3092599; Kondolf Tr. Test. (vol. 11) 2681:2-24; (2) Florida took aggressive action to halt the Corps' dredging nearly 20 years ago and has since remediated dredging impacts, Hoehn PFD ¶¶ 60-61; FX-404 (denial of dredge permit); Hoehn Tr. Test. (vol. 1) 221:14-222:24; (3) the relatively limited River segments impacted by dredging experienced significant recovery after dredging ceased, Hoehn PFD ¶ 61; Kondolf PFD ¶¶ 38-45; Allan PFD ¶ 82; Hoehn Tr. Test. (vol. 1) 140:11-141:7, 142:16-143:15, 224:23-225:19; Kondolf Tr. Test. (vol. 10) 2623:8-18; *id.* at (vol. 11) 2687:7-2689:6, 2695:3-21; and (4) the effects of reduced flows were felt throughout the River system, including in areas unaffected by dredging or channel changes, Hoehn PFD ¶ 59; Kondolf PFD ¶ 34; Allan PFD ¶ 83; Kondolf Tr. Test. (vol. 11) 2695:24-2697:1, 2715:3-16.

Finally, Georgia did not present any argument or evidence at trial that Florida's injuries relate to the ditching and draining of swamp areas in Tate's Hell Forest. Instead, the evidence showed those activities have had virtually no impact on salinity, because flows through Tate's Hell Forest represent just one to two percent of total inflow into the Bay, and the water would flow to the Bay regardless of any changes. *See* Greenblatt Tr.

Test. (vol. 7) 1792:7-1793:12; Greenblatt PFD ¶ 11; Cyphers PFD ¶¶ 72-73. Moreover, Florida has actively and extensively restored the Tate's Hell area. Cyphers PFD ¶¶ 70-73.

d. *Georgia's Own Experts Have Acknowledged That The Real Blame For The Region's Ecological Devastation Lies On Georgia's Unwillingness To Regulate Water Use*

Meantime, Georgia's own officials have long recognized that Georgia's unwillingness to reign in consumption is responsible for the region's ecological devastation. In 1992, the director of Georgia's EPD admitted that "Georgia has [an] area of potential groundwater overdraft . . . in the southwestern corner of the state where there have been large withdrawals made in the last two decades for the irrigation of crops." FX-1 at GA00811963. In 1995, Georgia's Department of Natural Resources (DNR) warned that Georgia's methodology for ensuring adequate river flows was not "scientifically defensible" and could lead to "significant degradation of stream communities." FX-36 at GA00100747. By 1999, the EPD director recognized that "*we've already exceeded the 'safe' upper limit of permitable [irrigation] acreage in the lower Flint*," and that "[o]ver-use will cause severe impacts on fish and other aquatic life in the Flint River and its tributaries." FX-4 at GA01419036-37. That same year, Georgia's Chief of Fisheries concluded there was "clear evidence that groundwater is over-allocated in the lower Flint River basin." FX-6 at FL-ACF-0254447. EPD later acknowledged that, "[s]ince extensive development of irrigation in the lower Flint River Basin, drought-year low flows are reached sooner and are lower than before irrigation became widespread. . . . These data provide the clearest evidence that agricultural irrigation compounds the effect of climatic drought on stream flow in the Basin." JX-21 at 22. Indeed, as DNR put it, "in a drought

year, a few thousand farmers will still consume more water than six or seven million people in metro Atlanta will in 2030." FX-15 at GA00181626.

B. Georgia's Increased Water Consumption Is Unreasonable And Contrary To Equitable Principles (Question 2(b))

Despite knowing full well that its increasing consumption had resulted in significant streamflow declines beginning in the early 1990s, Georgia refused to take any meaningful steps to eliminate or even scale back its wasteful practices. As Special Master Lancaster determined, "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." Lancaster Report 34. If ever there was a state that failed "to take reasonable steps to conserve and even to augment the natural resources within [its] borders" as required by "the doctrine of equitable apportionment," *Idaho II*, 462 U.S. at 1025, Georgia is it.

This will not be news to Georgia's own environmental officials. They have previously recognized that "the state *will* need to put a cap on water depletions one of these days from the Floridan aquifer to keep water flowing in the lower Flint River in drought years." FX-5 at 1. "It will hurt Georgia's chances in federal court," they wrote, "if we let irrigation deplete the river . . . . All of these facts have become known over the course of 1998. It is now necessary to act on them." FX-4 at 5-6. And yet Georgia just continued to grant more irrigation permits year after year, adding approximately 124,000 acres in 1999-2000 alone. FX-D-16 (data compiled from JX-132).

In 2006, the U.S. Fish and Wildlife Service itself urged Georgia to live up to its responsibilities, telling the Georgia EPD that "[t]he current over-allocation of water, as it is enacted in low-flow years, does not appear to protect current downstream agricultural users or other water users; it is also not protecting future users." FX-46 at 2. But rather than make changes to address that "current over allocation of water," *id.*, Georgia again did exactly the opposite: It decided to authorize even *more* irrigation permits, and between 2006 and 2015 issued nearly 1,400 permits covering more than 160,000 acres of newly irrigated farmland. FX-D-16. All told, Georgia's permitted acreage nearly doubled since it first acknowledged its problems with over-irrigation in the early 1990s, grew by 40 percent since 1998, and even after 2006 grew by nearly 20 percent. *See* FX-D-6 (citing JX-132); FX-D-16; Reheis Tr. Test. (vol. 3) 645:11-646:24 (admitting that after moratorium, Reheis issued roughly 864 additional permits for more than 100,000 acres); Cowie Tr. Test. (vol. 9) 2194:24-2200:14 (discussing permitting since 1999). Most of those permits, moreover, contain no limitations on the water farmers can use for their irrigation, leaving Georgia farmers with no economic incentive whatsoever to invest in more efficient irrigation systems. *See* Lancaster Report 33.

As Special Master Lancaster concluded, "[e]ven the exceedingly modest measures Georgia has taken have proven remarkably ineffective." *Id.* As he explained, the Flint River Drought Protection Act (FRDPA), Ga. Code Ann. § 12-5-540 *et seq.*, was enacted for the ostensible purpose of "buy[ing] back" agricultural irrigation rights at auction during drought in order to reduce water use, but has been administered in such a way as to become effectively dead letter. *See* Lancaster Report 33 (citation omitted). In 2011, "[d]espite

early warnings of oncoming drought, [EPD] . . . chose not to declare a drought," "clearly not wishing to incur the cost of preventative action." *Id.* at 33-34 (citing Turner PFD ¶ 87; FX-78; Cowie Tr. Test. (vol. 9) 2258-59). "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." *Id.* at 34 (citing Turner PFD ¶ 91; JX-69; Zeng. Tr. Test. (vol. 13) 3252-56; Turner Tr. Test. (vol. 12) 3081-82).

Even for Atlanta and other portions of the ACF, which have at least *begun* to take steps to conserve water, it is clear that far more could and should be done. State agencies and Georgia task forces have proposed a number of conservation actions there that the State has—to date—refused to take. *See* JX-40; JX-41; Kirkpatrick Tr. Test. (vol. 13) 3396:15-3397:4, 3397:9-3398:10, 3399:12-3400:19. For example, although Georgia planned to build the new Glades reservoir (near Atlanta) to alleviate its needs for water during drought, it dropped that initiative in 2016 once it believed the Corps would grant its request for additional water from the Corps' Chattahoochee dams. Turner PFD ¶ 55; GX-829 at GA02451929-30. Likewise, although Georgia has policies to halt or reduce outdoor lawn watering during droughts, it failed to implement them during the most severe 2011-2012 drought. Sunding PFD ¶ 16; Kirkpatrick Tr. Test. (vol. 13) 3411:18-3412:3.

That Georgia has seen the need to adopt reforms—even if it failed to follow through on them—is proof positive that its consumption is unreasonable. And Georgia's own admissions also help to show just *how far* past reasonable limits the State's consumption has gone. As discussed above, *see supra* at 21-22, by the mid-1990s Georgia officials had recognized that its overconsumption could lead to "significant degradation of stream

communities," FX-36 at GA00100747, and when consumption continued to increase they quickly acknowledged that "*we've already exceeded the 'safe' upper limit of permitable [irrigation] acreage in the lower Flint*," FX-4 at GA01419036. At the time, Georgia's consumptive use hovered between 3,000 and 3,500 cfs. *See* Hornberger PFD ¶ 37, fig. 7. But in the 20 years since then, Georgia's consumptive use has peaked in drought years at approximately 5,000 cfs, 1,500 to 2,000 cfs *more* than even Georgia believed reasonable. *See id*. Similarly, Georgia's permitted irrigation acres have nearly doubled since the early 1990s and increased by 40 percent since 1998. *See supra* at 23.

Georgia's own "sustainability" analyses point to a similar conclusion. When Georgia analyzed a portion of the Flint River in 2011, it found that irrigation was withdrawing far too much water, based on a maximum shortfall of 1,376 cfs in Flint River flows at the Bainbridge gage, and significant shortfalls during other dry and drought years as well. FX-24 at 3-6, 3-9; GX-1247 at ES-4; FX-961 (slides 11, 14); FX-961a (Caldwell Dep. 35:2-8, 37:15-25, 35:2-8). A shortfall of 1,376 cfs along much but not all of the Flint River is consistent with the conclusion that Georgia's overall consumption exceeds reasonable limits by between 1,500 and 2,000 cfs. Likewise, in the Flint River Basin Regional Water Development and Conservation Plan, Georgia recommended triggering the FRDPA to reduce irrigation in predicted drought years by 20 percent (a figure criticized by federal officials for not being sufficiently protective of the environment). JX-21 at 52, 54; FX-46 at GA00537489-91. If Georgia had carried out that plan—which it did not—it would have capped irrigation at approximately 450,000 acres in drought years. See JX-21

at 15. Instead, in 2013 Georgia had roughly *800,000 irrigated acres*—nearly 80 percent more than its own conservation plan called for. Sunding PFD ¶ 28 & table 1.

In the face of all this evidence, Georgia's defense to the reasonableness of its consumption has rested on the claim that "Georgia's *total* consumptive water use in the Basin has never reached a monthly average of 2,000 cfs." Ga. Exceptions Resp. 17 (citing Zeng PFD ¶¶ 5, 22-23). But as discussed above, the reality is quite different. *See supra* at 17. And Georgia's failure to argue that consumption levels substantially above 2,000 cfs are reasonable notwithstanding the harm they cause reflects a basic truth: They aren't.

Instead, under the so-called "regulated riparian" regime that Georgia law admits is appropriate for resolving water rights disputes, upstream uses are not reasonable (and thus are appropriately enjoined) where they cause "unreasonable adverse effects" downstream. JX-21 at 79, § 5.1.5 (Georgia EPD recognition of authority to halt irrigation if water use would cause "unreasonable adverse effects"); *see Florida v. Georgia,* 138 S. Ct. at 2513. Georgia "cannot complain if the same rule is administered between herself and a sister state." *Kansas v. Colorado*, 206 U.S. 46, 104-05 (1907). And under that rule, the devastation that Georgia's overconsumption over the last several decades has wrought in Florida means that Georgia's present consumption is unreasonable—especially given the modest steps that Georgia could take to prevent those effects in Florida. *See infra* at 33-38 (discussing common-sense reforms Georgia could implement to reduce consumption).

The record, in short, overwhelmingly establishes that Georgia's "largely unrestrained" consumption (Lancaster Report 32) is patently unreasonable.

C. The Water Saved From Georgia's Wasteful Practices By An Equitable Decree Would Flow Into Florida (Questions 3 and 4)

At this point, Georgia's primary defense has been that the Court cannot do anything to address Georgia's wasteful practices because there is no guarantee that water saved by a decree ultimately would flow to Florida given the Corps' role in managing reservoirs in Georgia. Special Master Lancaster believed the Court's precedents required him to accept that argument. But after clarifying the relevant principles, the Supreme Court rejected the argument in its decision last June. *Florida v. Georgia,* 138 S. Ct. at 2526.

The legal significance of the Corps' discretion was the central issue before the Court. And, in rejecting Special Master Lancaster's conclusion that it was required to deny relief because of the lack of "sufficient certainty" about how the Corps will react (Lancaster Report 31), the Court repeatedly emphasized that "[f]lexibility and approximation are often the keys to success in our efforts to resolve water disputes between sovereign States." *Florida v. Georgia*, 138 S. Ct. at 2527. "Consistent with the principles that guide our inquiry in this context," the Court stressed, "answers need not be 'mathematically precise or based on definite present and future conditions.'" *Id.* (citation omitted). Instead, "[a]pproximation and reasonable estimates may prove 'necessary to protect the equitable rights of a State.'" *Id.* (citation omitted). Given those considerations, the Court found that it "[could] not agree with the Special Master that the Corps' 'inheren[t] discretio[n]' renders effective relief impermissibly 'uncertain' or that meaningful relief is otherwise precluded." *Id.* at 2526 (alterations in original) (citation omitted).

Moreover, the Court concluded based on the record that, "if necessary *and with the help of the United States* . . . [the Court] should be able to fashion [a decree]" that will afford relief, and so the Court remanded for further proceedings. *Id.* (emphasis added). In doing so, the Court emphasized that the analysis of how a decree will operate in practice and the benefits it would generate need not be based only on the Corps' existing operational Master Manual (developed based on Georgia's current consumption levels), but instead can appropriately take account of the "reasonable modifications that could be made to that Manual" in response to a decree that ultimately makes *more* water available by capping Georgia's consumption of water before it enters the Corps' system. *Id.* at 2527.

The Supreme Court explained that "[t]he United States has made clear that the Corps will work to accommodate any determinations or obligations the Court sets forth if a final decree equitably apportioning the Basin's waters proves justified in this case." *Id.* at 2526. And that only makes sense. If the Court enters a decree requiring Georgia to reduce its consumption, the water generated by that decree will be water the Corps did not anticipate receiving, and does not require, in order to meet all of the ACF system needs under the current Master Manual. *See* Record of Decision adopting Proposed Action Alternative for Implementation of Updated ACF Master Manual (Mar. 30, 2017) ("R. of Decision") at 8, 19 ("The [selected Manual alternative] would . . . operate the federal ACF projects for their authorized purposes, in light of current conditions"). Once the Court equitably apportions that water to Florida, therefore, the Corps would pass it along to Florida, either through exercise of its discretion under the existing Manual (as Special Master Lancaster found it has done in the past, *see* Lancaster Report 55) or, if necessary, by changing its Manual.

In any event, as the Supreme Court also recognized, even if the Corps made no discretionary releases during formal "drought operations" and did not amend the Master Manual, the releases already anticipated under the existing Manual would be beneficial to Florida. *Id.* at 2523. Under the existing Manual, "[d]rought operations" are not coincident with climatic droughts (low precipitation), but depend instead on enumerated water levels in four ACF reservoirs in Georgia. *See* Master Manual at 7-22 (2017). History shows that reservoir "drought operations" did not occur during the first year of recent climatic droughts, *e.g.*, in 2007 or 2011, and were only triggered during the second year of those droughts. *See, e.g.*, Final Envtl. Impact Statement (FEIS) at 4-18 to 4-20 (2016); R. of Decision at 2; FX-811 at 2; GX-924. Additional water would thus mean additional releases during the first year of a drought, prior to the onset of drought operations.

Moreover, stockpiling even just a portion of the additional water would allow the Corps to reduce the onset and duration of drought operations. *See Florida v. Georgia*, 138 S. Ct. at 2523-25. During the 2011-2012 drought, for example, if the Corps had been able to store (or not release) a mere 40,000 acre-feet more water, it could have avoided drought operations entirely. *See id.* at 2523 (citing GX-924 (showing storage dipped only incrementally into drought operations in 2012)); FX-811 at 2. Increasing streamflow by 2,000 cfs in peak summer months would have generated three times that much water in a single month, leaving two-thirds of the water saved to flow through to Florida even without any modifications to the Corps' Master Manual. *See* Fla.'s Exceptions Br. 48-49, *Florida v. Georgia*, 138 S. Ct. 2502 (filed May 31, 2017). And staving off drought operations, for days or weeks, would increase flows when the Apalachicola most needs it.

For all of those reasons, the only "reasonable prediction[]," *Florida v. Georgia*, 138 S. Ct. at 2514 (citation omitted), is that Florida would materially benefit from all or substantially all of the water generated by a decree capping Georgia's consumption.

D. The Benefits Of A Decree Would Substantially Outweigh The Costs Of A Decree (Questions 5, 6, and 7)

All that remains is whether the benefits of a decree are likely to substantially outweigh the costs. Here again, the record permits only one answer: Yes, clearly.

1. *A Decree Would Result In Critical Benefits To Florida And The Apalachicola Region*

Florida seeks a two-part decree in this case: (1) an every-year cap on Georgia's total consumption in the ACF at current levels until at least 2050; and (2) a cap sufficient to reduce Georgia's streamflow depletions at the state line by up to 2,000 cfs (from recent drought-year peaks) for years in which drought is predicted in the ACF.[6] Both aspects of such a decree would produce critical benefits for the Apalachicola Region. As to the first, an every-year cap at current levels would ensure the situation does not worsen even more dramatically, and would enable replenishment of the Upper Floridan aquifer during non-drought years so that when droughts do come, their effects on streamflow are not as severe. *See*, *e.g.*, Hornberger PFD ¶¶ 98-102 ("[A]pproximately 90% of groundwater removed through agricultural pumping eventually becomes a streamflow depletion."). As to the

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[6] Florida references the year 2050 in its proposal because Georgia's water demand projections through that year—submitted in requests to the Corps, *see* FEIS at ES-2-5; *see also* JX-126 at 1-2—provide a benchmark against which to compare an initial remedy. The decree would be adjusted and applied to future years as warranted. Drought predictions triggering aspects of the decree could be performed using well-established criteria. *See* Hornberger PFD ¶¶ 131-33.

drought year reductions, meanwhile, the Supreme Court explained that "the record suggests that an increase in streamflow of 1,500 to 2,000 cfs is reasonably likely to benefit Florida significantly." *Florida v. Georgia*, 138 S. Ct. at 2520. Indeed, even an increase of 1,000 cfs would help to facilitate meaningful recovery. *See, e.g.*, Kimbro PFD ¶ 7; Glibert PFD ¶¶ 15(e), 9-21, 32, 49, 57-60, 81-84; Allan PFD ¶¶ 26, 32, 43, 66-67, 73-74.

Such a decree would take key steps to restore the conditions under which the Apalachicola River and Bay survived and thrived for centuries before Georgia's consumption spiked in the past several decades. The historical record shows that in the past, Bay and River resources quickly recovered from droughts so long as severe low flows below 6,000 cfs were only occasional, not persistent. In the droughts of 1986-88, for instance, flows fell substantially below 6,000 cfs in two summer months but ultimately recovered, and there was no fisheries disaster (as occurred in 2011-12). *See* FX-D-1; Sutton PFD ¶¶ 59, 66 (noting past rebounds of oyster stocks). Even the severe low flows seen in 1999-2001 did not precipitate a total crash of the fisheries; although severe low flows persisted for a few months in 2000, the same pattern was not immediately repeated thereafter (in part because Georgia paid farmers not to irrigate under the FRDPA during a portion of that drought period, *e.g.*, Reheis PFD ¶¶ 52-56), and the oysters soon recovered. The difference in 2011-12 was that flows dropped well below 6,000 cfs and remained there for many months at a time for multiple years, FX-D-1, and Georgia took no action to reduce its irrigation. *See supra* at 23-24.

This historical record of the River and Bay's resiliency when flows were consistently maintained at levels 1,000 to 2,000 cfs above current minimums is more than

sufficient, by itself, to support the "reasonable predictions" that the River and Bay would recover with the help of a decree. *Florida v. Georgia*, 138 S. Ct. at 2514 (citation omitted). But Florida presented more. With regard to the Bay, Florida offered scientific evidence that increases in freshwater flow and corresponding reductions in salinity would positively impact the oyster population by driving out predators and promoting an increase in oyster biomass. *See*, *e.g.*, Kimbro PFD ¶¶ 7, 101; Kimbro Tr. Test. (vol. 6) 1570:23-1572:2. That evidence showed that a remedy preventing the recent pattern of persistent low flows from recurring is likely to allow the Bay to more closely approximate its natural function, with healthy periods of drought and recovery, and prevent another devastating crash. *See*, *e.g.*, Kimbro PFD ¶ 7; Glibert PFD ¶¶ 5(e), 81-84; Allan PFD ¶¶ 65-70.

Georgia sought to discount this evidence by characterizing as "*de minimis*" the reductions in salinity of approximately 1 ppt that a 1,000 cfs cap would have produced in 2012. Ga.'s Post-Trial Br. 86-87. But exactly that type of flow reduction—a persistent decrease that allowed predators to thrive—caused the 2012 crash in the first place. Georgia also misrepresents the importance of the salinity and nutrient impacts of greater flows: It deliberately obscured the fact that as a *comparative* figure, 1 ppt is highly significant—some key areas of the Bay, for example, normally have salinities of between 0-5 ppt. Glibert Tr. Test. (vol. 7) 1869:23-1870:12. Thus, the U.S. Fish and Wildlife Service found that the 1 ppt salinity change would materially improve the survival rates of oysters and juvenile Gulf sturgeon. JX-122 at 34; *see also* Kimbro Tr. Test. (vol. 6) 1570:24-1572:2.

As Special Master Lancaster observed, "[t]he oyster collapse has [also] greatly harmed the *oystermen* of the Apalachicola Region, threatening their long-term

sustainability." Lancaster Report 32 (emphasis added) (citing Ward PFD ⁋⁋ 24-29, 42). A decree improving the survival rates of oysters would therefore benefit the people whose livelihood depend on the oysters, to say nothing of sustaining the "distinctive culture and fishery built around the harvesting of oysters" in the Apalachicola. *Id.* at 9-10 (citing Steverson PFD ⁋⁋ 27-28; Ward PFD ⁋⁋ 12-18); *see id* at 10 ("The harvesting and sale of shrimp, crab, fish, and oysters is the primary economy in the Apalachicola Region.").

Florida provided ample scientific evidence of the benefits of a decree for the River, too. The evidence showed that maintaining river flow levels at 6,000 cfs, 7,000 cfs, or higher would ensure that many more Apalachicola floodplain sloughs remain connected and would keep channel margins inundated, greatly benefiting the river life and the Apalachicola forests. *See* Hoehn PFD ¶¶ 43, 48-50, 53; Allan PFD ¶ 67; *id.* ¶¶ 26-27, 32, 43, 66, 73-74; Kondolf Tr. Test. (vol. 10) 2629:7-15; Allan Tr. Test. (vol. 3) 580:18-584:7 (noting that a wide range of sloughs disconnect between 5,000 and 9,000 cfs).

The benefits of restoring flows to the River and Bay, and recreating the conditions in which they thrived for centuries, are both clear and significant.

2. *The Costs Of A Decree To Georgia Would Be Reasonable*

These benefits outweigh the true costs of a decree to Georgia. Florida's economic expert, Dr. Sunding, calculated annual fiscal costs to Georgia of approximately $35 million for a remedy that would increase flows to Florida by 2,000 cfs during periods of peak consumption, and considerably less for a more limited remedy. *See* Sunding PFD ¶¶ 88-93 & tables 4-6. And many of those costs are not even properly cognizable in the equitable balance, because they simply represent the expense of implementing "reasonable

conservation measures" that numerous other States (including Florida) already employ. *Colorado I*, 459 U.S. at 186. The Court has insisted that a State must adopt such conservation measures *first*, and that only the costs that remain *after* it has done so are properly weighed in the equitable apportionment. *See id.* ("We conclude that it is entirely appropriate to consider the extent to which reasonable conservation measures by New Mexico might offset the proposed Colorado diversion and thereby minimize any injury to New Mexico users."). Any other approach would perversely reward States, like Georgia, that have historically refused to adopt such practices voluntarily, by allowing them to treat as a "cost" the simple prevention of waste. *See id.* at 195 (O'Connor, J., concurring in the judgment) ("Protection of existing economies does not require that users be permitted to continue in unreasonably wasteful or inefficient practices.").

Even if those costs are given weight, the balance still decisively favors Florida. Taking Florida's proposed every-year cap first, the evidence shows that capping Georgia's every-year water consumption at current levels would not impose undue costs. Predicted growth in demand in metropolitan Atlanta can be offset with the same types of measures Georgia and Atlanta have already committed to take, including by accelerating leak abatement and actually following their own outdoor watering restrictions during drought periods. Sunding PFD ¶¶ 41-44, 73-75; JX-41 at 28, fig. 13, 32; JX-40 at 3, 6, 61, 63; *see also* Kirkpatrick Tr. Test. (vol. 13) 3396:15-3398:10. In the Flint Basin, meanwhile, Georgia could not possibly claim that further expansion of its irrigation practices would be "reasonable" in light of other water needs downstream; indeed, Georgia made no attempt to argue at trial that it would need more irrigation water than it currently uses at any point

in the future. At most, therefore, the every-year cap would require Georgia to stop granting backlogged permits, and begin enforcing current acreage limits in the permits that already exist—steps Georgia has not seriously argued would be unreasonable.

The second component of Florida's proposed remedy—a cap sufficient to reduce streamflow depletions by between 1,000 and 2,000 cfs during years in which drought is predicted—would require more affirmative steps by Georgia, but its costs would still be reasonable, especially given the harms Georgia is inflicting. Florida's expert, Dr. Sunding, provided multiple examples of precisely how Georgia could achieve such reductions with a range of different measures, almost all of which have either been proposed by Georgia officials internally or utilized successfully in other States, including in Florida.[7]

Georgia's response to this evidence is unconvincing. For example, it has focused primarily on generalized observations about the needs of the Atlanta metropolitan area and the comparative size of Georgia's population and economy, even though Florida's proposed cap would have virtually no impact on those high-level figures.[8] Instead, Florida's proposed remedy focuses primarily on irrigation of row crops in the Flint Basin.

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[7] *See* Sunding PFD ¶¶ 46-47, 49-50, 52, 55-61, 67-70, 80, 84, 86, 90 & tables 4-6; FX-784 ¶¶ 161-65, 173-77; JX-154 at 2; Sunding Tr. Test. (vol. 11) 2851:3-22, 2867:8-17, 2852:5-2853:7, 2853:16-856:4; Turner Tr. Test. (vol. 12) 2980:18-2981:4, 2974:22-2976:9; Cyphers PFD ¶¶ 36-37, 39-40, 53-56; Cowie Tr. Test. (vol. 9) 2250:5-19.

[8] For example, Georgia's economic expert, Dr. Stavins, assumed a decree would create massive disruption in industries such as poultry processing and aircraft and pharmaceutical manufacturing, *see, e.g.*, Stavins PFD demos. 15, 16—none of which would actually be impacted by Florida's proposed cap. He also focused at length on costs that are already contemplated under Georgia's own laws and thus not properly attributable to a decree, such as the effects that limits on outdoor lawn watering in Atlanta might have on landscaping and yard-care businesses during droughts. *See* Sunding PFD ¶ 16.

Such crops represents less than one half of one percent of the Georgia economy there. Sunding PFD ¶ 21. Even in the Lower Flint River Basin, where agriculture is most concentrated, *all* agricultural activity (including many things beyond the row crop cultivation that would be affected by a decree) accounts for just five percent of economic output. *See* Stavins PFD ¶ 19. And only about half of Georgia's row crops are currently irrigated, demonstrating that many Georgia farmers continue to be successful with no irrigation at all. Sunding PFD ¶ 22.

Moreover, Georgia's witnesses took aim at a straw man, suggesting that Florida is proposing to halt all irrigation in the region—something Florida does not remotely propose. Instead, Florida simply seeks to introduce reasonable conservation measures, such as increasing irrigation efficiency, drilling irrigation wells to deeper aquifers that enable continued irrigation without impacting river flow, paying farmers not to irrigate in particular years (as current Georgia law already contemplates), or buying back irrigation rights for some acreage. Sunding PFD ¶¶ 55-61, 86, 90 & tables 4-6; *see* Turner Tr. Test. (vol. 12) 2968:19-2969:14 (FRDPA never implemented after 2002). Georgia's experts and other witnesses did not genuinely consider or rebut Florida's assessment of the costs of these measures. Indeed, Georgia declined to call its designated agricultural expert, Dr. Irmak, at trial. Meanwhile, Georgia's economic expert, Dr. Stavins, acknowledged that he made no effort to analyze the costs of *limiting* (rather than eliminating) most irrigation in the ACF, or the possibility of saving water by altering *how* irrigation was done, including by adopting Variable Rate Irrigation and other irrigation efficiency measures, implementing irrigation scheduling, using sod-based and other crop rotations, reducing

water loss from farm ponds, aquifer storage and recovery, capping irrigation water amounts, or moving higher-value crops to deeper aquifers.[9] Dr. Stavins' failure even to consider the available measures for *limiting* irrigation or changing *how* it is done greatly undermines the credibility and weight of his testimony and overblown cost estimates.

Dr. Stavins also estimated the cost of Georgia buying irrigation rights from farmers as more than twice as high as the purchase price for acquiring the irrigated land itself, despite many authoritative sources of information that the cost would be far lower.[10] As Florida demonstrated at trial, the actual costs of purchasing those irrigation rights would likely be one tenth of Dr. Stavins' projections. *Compare* Sunding PFD ¶ 62, *with* Stavins PFD ¶¶ 109-10, demo. 17. Making matters worse, Dr. Stavins made no effort to calculate certain positive economic impacts of a decree, such as the beneficial effects for local economies of cash payments to farmers for reducing irrigation (even as he assumed that the resulting reductions in irrigation would have large indirect *costs* for local economies). Sunding PFD ¶¶ 91-92. Nor did he take into account the fact that even without irrigation from the River or the Upper Floridan aquifer, Georgia farmers could actually maintain or increase their crop yields from current levels while reducing their water use at the same time. *Id*. ¶ 91. And Dr. Stavins ignored entirely the programs in Florida, Nebraska,

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[9] *See* Stavins Tr. Test. (vol. 17) 4437:23-25, 4444:10-24, 4445:19-4446:6, 4450:23-4452:18, 4453:18-21, 4455:7-15, 4456:13-4457:1, 4463:2-13, 4465:24-4467:12, 4484:18-23, 4486:16-22; *see also* Masters Tr. Test. (vol. 14) 3668:12-15; Masters PFD ¶ 76; FX-960 at 44-45 (showing potential 70-80% water savings from sod-based crop rotation); GX-868 at 77-78; Sunding PFD ¶¶ 98-99, 103.

[10] *Compare* Stavins PFD ¶¶ 109-10, demo. 17, *and* FX-D-49, *with* FX-927 (farm land average values); *see* Stavins Tr. Test. (vol. 17) 4476:11-4479:5, 4482:16-20.

Nevada, Oregon, and California where irrigation-related limitations have been successful. *See* Sunding Tr. Test. (vol. 11) 2850:25-2851: 22, 2852:5-2853:7, 2853:16-2856:4, 2867:8-17; FX-784 ¶¶ 161-65, 173-77; Cyphers PFD ¶¶ 36-37, 39-40, 53-56.

Ultimately, the evidence overwhelmingly establishes that Georgia, like Florida and other States, can reasonably manage its irrigation practices and reduce its consumption considerably by eliminating waste, so that it is practicing what both States' laws regard as "reasonable use." JX-21 at 43, 79. And once again, Georgia's prior statements undercut its litigating position here. Georgia itself introduced evidence showing it had previously offered to work with the Corps on facilitating modifications that would ensure minimum flows of 6,000 cfs at the state line. *See* Turner Tr. Test. (vol. 12) 3074:18-3076:21; Zeng PFD ¶¶ 140-41 (indicating that such an option could be "feasible"). Among other things, Georgia's proposal included building the Glades and other reservoirs (at a cost of hundreds of millions to the State) and moving a number of irrigation wells to lower aquifers that do not impact river flow (at additional cost to the State). *See* Zeng PFD ¶¶ 140-41; JX-154 at 2; Turner PFD ¶¶ 55-56. Ultimately that proposal went nowhere, but it provides a relevant yardstick of what Georgia thought would be a reasonable expense to prevent further harm to the River and Bay—an amount that is not wholly dissimilar from the anticipated expense of Florida's proposed remedies. *See* Sunding PFD ¶¶ 88-93 & tables 4-6.

III. THE SPECIAL MASTER HAS FLEXIBILITY IN DETERMINING THE FORM THAT A DECREE SHOULD TAKE IN THIS CASE

Because the benefits of a decree would substantially outweigh the decree's costs, the Special Master should recommend that the Court enter a decree in Florida's favor. A

decree could take different forms. As discussed, Florida has proposed a decree requiring that Georgia limit every-year consumption to current levels through 2050, and reduce consumption in years where drought is predicted by an amount sufficient to increase state-line flows by 2,000 cfs (or any other amount the Court deems appropriate) from current drought-year levels. Such a decree is reasonable and would be effective. *See* Hornberger PFD ¶¶ 127-39 (explaining how imposing a consumption cap is practical and verifiable).

Florida has proposed multiple examples of reasonable measures Georgia could take to achieve both requirements, *see, e.g.*, Sunding PFD ¶¶ 88-90 & table 4, but Georgia could take other measures with similar impacts.[11] Georgia might, for example, renew its plans to construct reservoirs to supplement drought year flows, or take other mitigation measures it has previously considered. *See, e.g.*, *supra* at 34. Alternatively, Georgia could approach the Corps (perhaps in conjunction with Florida) about discretionary actions the Corps could take or "reasonable modifications" that could be made to the Master Manual to increase flows to Florida in dry and drought periods. As indicated, Georgia has proposed modification of Corps operations previously, with an intended 6,000 cfs minimum flow. *See supra* at 38. And the ACF Stakeholders' deliberations and report, FX-883, supported by personnel on Atlanta's Regional Commission and other Georgia stakeholders, *see id.* at "Acknowledgements," provides another example of proposed modifications to Corps

[11] Because Georgia would and should have flexibility in deciding how to make the consumption reductions required by a decree, it is impossible to say in advance how much the decree would increase flows along the Flint River specifically. *See* Case Mgmt. Order No. 25 at 4. Florida anticipates, however, that a significant majority, if not the vast majority, of the water saved by a decree would come in the Flint River.

operations—along with many other steps to be taken by the States—to supplement drought year flows to Florida. *See id.* at 4-6, 62-92; *see also* Turner Tr. Test. (vol. 12), 3093:18-3094:9 (stating that ACF Stakeholders proposed "real commonsense changes" to Corps operations). In 2012, the changes that report recommended could have increased flows by nearly 4,000 cfs during the four designated weeks, *see id.* at 4, 73; that same amount of supplemental flow, if allocated differently across the summer, could have added 1,000-2,000 cfs in flows to Florida over much of the key summer period in 2011-12.

Florida respectfully suggests that the Special Master issue a report finding that Florida is entitled to a decree, then instruct the parties to negotiate, including as appropriate with the Corps, regarding the final form of a recommended decree.[12] The Corps has made clear that it would be willing to participate in such negotiations. *See, e.g.*, U.S.' Opp. to Ga.'s Mot. to Dismiss 18 n.4 (Mar. 11, 2015), Dkt. No. 66. Such a process would facilitate the execution of the decree in a way that would likely prove more efficient in the long run. Alternatively, the Special Master could invite additional briefing, or hold further proceedings, on the particular form that a decree should take. But the Special Master should recommend that the Court find that Florida has shown it is entitled to relief.

CONCLUSION

For the foregoing reasons, the Special Master should recommend the Supreme Court enter a decree equitably apportioning the waters of the ACF Basin.

[12] If the parties are unable to agree to the form of judgment within 120 days, the Special Master could order adversarial briefing in favor of their preferred judgment forms.

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Respectfully submitted,

/s/ Philip J. Perry

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