

No. 142, Original

**In The
Supreme Court of the United States**

STATE OF FLORIDA,

Plaintiff,

v.

STATE OF GEORGIA,

Defendant.

**GEORGIA'S OBJECTIONS TO WRITTEN DIRECT TESTIMONY OF PATRICIA
GLIBERT, PH.D.**

SAMUEL S. OLENS
ATTORNEY GENERAL
STATE OF GEORGIA DEPARTMENT OF LAW
40 Capitol Square
Atlanta, GA 30334
Tel.: (404) 656-3383
AGOlens@law.ga.gov

CRAIG S. PRIMIS, P.C.
Counsel of Record
K. WINN ALLEN
DEVORA W. ALLON
KIRKLAND & ELLIS LLP
655 15th Street, NW
Washington, DC 20005
Tel.: (202) 879-5000
craig.primis@kirkland.com

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Pursuant to Case Management Order 20, the State of Georgia hereby serves objections to the admission of the following portions of the Direct Testimony of Patricia Glibert, Ph.D.

Portion of Testimony	Basis of Objection
¶1 (“Apalachicola Bay has received a high degree of protection (<i>See</i> Figure 1, showing conservation lands around the Bay)).	Authenticity; Foundation
¶11	Authenticity; Foundation; Legal conclusion
¶12	Foundation
¶13 (“East Bay is an area of particular significance: its lower salinity and greater nutrient availability render it an important nursery region for many fish and invertebrate species, and it historically contained an extensive amount of submersed aquatic vegetation.”)	Foundation
¶13 (“East Bay also plays an important role as an oyster refuge when salinities become high in the Bay proper, as Dr. Kimbro explains.”)	Foundation
¶17 (“As I will discuss in more detail below, a particular concern in the Bay is that many of these harmful algal species increase in abundance under low-flow conditions, which have become more common in Apalachicola Bay with increased upstream consumption by Georgia, as explained in the testimony by Dr. Hornberger.”)	Foundation; Speculation
¶19	Foundation; Speculation
¶20	Foundation; Speculation
¶21	Foundation; Speculation
¶26	Foundation; Not Disclosed in Discovery

Portion of Testimony	Basis of Objection
<p>¶27 (“I have found that water quality in Apalachicola Bay has changed directly as a result of reductions in freshwater flow, which Dr. Hornberger has described are caused by an increase in Georgia’s consumption. These changes are especially harmful because the greatest impact of increased consumption comes at the time when low flow naturally occurs, during summer and fall, when the estuary is already experiencing natural stress.</p> <p>With reduced freshwater flow, over increasingly large areas of the Bay water quality becomes more like the Gulf of Mexico with higher salinities and less beneficial delivery of nutrients.”)</p>	Foundation
<p>¶27 (“Dr. Robert Livingston, one of the most preeminent Apalachicola Bay researchers, reached the same conclusion in his analysis of river flow effects on Apalachicola Bay - even before the most severe low flow years (2011-2012) occurred. (See Livingston 2008 (FX-379)). As he said, ‘Without adequate river water input, the Apalachicola estuary, one of the most prolific in North America, would be transformed into a much less productive system.’”)</p>	Hearsay
<p>¶31</p>	Foundation
<p>¶33</p>	Foundation
<p>¶38 (“I also reviewed a report that became available very recently after preparation of my report that summarizes the results of field investigations done by various estuarine researchers at Florida State University, discussing phytoplankton composition including the critical 2011-2012 years. (Phlips Report 2016 (FX-359)).”)</p>	Hearsay; Not Disclosed in Discovery

Portion of Testimony	Basis of Objection
¶39 (“In fact, this trend was reaffirmed in the recent report by Dr. Phlips et al. (FX-359)) in which the top 40 types of phytoplankton were reported for the years 2008-2012 (<i>i.e.</i> , including the driest years of 2011-2012).”)	Hearsay; Not Disclosed in Discovery
¶40 (“This comparison shows that various freshwater phytoplankton species observed in 1973, the era prior to significant increases in Georgia consumption (<i>see</i> Dr. Hornberger Testimony), were rarely seen or not seen at all in 2014.”)	Foundation
¶46	Hearsay; Not Disclosed in Discovery
¶52 (“For comparison, in the recommended values of water quality for estuaries established by NOAA as reaffirmed for Georgia estuaries (Sheldon and Alber 2011 (FX-360)), a value of 20 µg chlorophyll-a per liter is considered to be “high” and associated water quality is considered to be “fair/poor.”)	Hearsay; Foundation; Authenticity
¶53	Foundation
¶58	Foundation; Speculation
¶59	Foundation; Speculation
¶64 (“This SAV did not recover for many years as flows remained relatively low, including during the drought year of 2007. (Livingston FDEP 2008 (FX-379)).”)	Hearsay; Foundation
¶66	Foundation; Speculation
¶67	Foundation; Speculation
¶68	Foundation; Speculation
¶69	Foundation; Speculation
¶70	Foundation; Speculation

Portion of Testimony	Basis of Objection
¶71 (“As Dr. Livingston has explained, he has observed these kinds of changes in the food web during low flow years. (Livingston FDEP 2008 (FX-379)).”)	Hearsay; Foundation
¶71 (“A more recent study of fish and invertebrate species also concluded that flow and salinity are strongly tied to what type of community is observed in the Bay. (Garwood et al. 2016 (FX-401)).”)	Hearsay; Foundation; Authenticity
¶71 (“There are numerous other studies that show that upper food web species change as flow changes. (E.g., Gandy et al. (FX-402)).”)	Hearsay; Not Disclosed in Discovery; Foundation
¶72 (“As the salinity regime changes due to Georgia’s consumption, as shown in Dr. Greenblatt’s testimony, some species of zooplankton will be less able to thrive and others will flourish, changing the nature of the food web.”)	Foundation; Speculation
¶73	Foundation; Speculation
¶75 (“In addition to effects due to food quality, research, including some that I performed (Glibert et al. 2007) (FX-358)), has established that certain harmful algae toxins have severe effects on oyster larvae. Each of the major HAB species in Apalachicola Bay has been shown in laboratory studies to have direct effects on oyster feeding, oyster spawning or larval development. <i>Karenia brevis</i> and <i>Karlodinium veneficum</i> toxins both cause larvae to become deformed and die because the toxins eat away at the cell membranes. (See Figure 21).”)	Relevance; Foundation; Authenticity

Portion of Testimony	Basis of Objection
<p>¶75 (“The maximum concentration of Karlodinium cells reported by Dr. Philips (Philips Report 2016 (FX-359)) is certainly in the range where these effects have been observed under laboratory conditions. Additionally, when Prorocentrum minimum are abundant, again in the range of values reported by Dr. Philips for 2011-2013, oyster spawning may not occur and such densities may also reduce the growth of larvae and juvenile oysters. As I have discussed above, the risk of these harmful algae proliferating in the Bay increases as flows decrease, and their maximum abundances in the recent data is many-fold higher than previous records have indicated. Even the toxic Pseudo-nitzschia, which too has increased during the very low flow years, affects oysters, which increase their pseudofeces production in response, costing them additional energy and harming their growth.”)</p>	<p>Hearsay; Not Disclosed in Discovery</p>
<p>¶¶77-80</p>	<p>Foundation; Speculation</p>
<p>¶¶81-82</p>	<p>Foundation; Speculation</p>
<p>¶83 (“While estuaries are dynamic and resilient, there is a limit to estuarine resiliency.”)</p>	<p>Foundation; Speculation</p>
<p>¶83 (“When naturally stressful periods of low flow are exacerbated by human consumption, as here, an estuary can be stretched beyond its capacity and experience disproportionately large effects such as the oyster crash observed in Apalachicola Bay.”)</p>	<p>Foundation; Speculation</p>

Portion of Testimony	Basis of Objection
<p>¶83 (“In East Bay especially, the data show that eutrophication, hypoxia, and anoxia occur during extreme low flows, indicating that there are harmful ecological changes during low flows exacerbated by Georgia consumption. And, the longer stressful low-flow conditions are maintained as a result of upstream consumption, the more difficult it comes for Apalachicola Bay to stabilize and recover. Thus, this degradation and shift in character of the Bay could lead to permanent harm to the Bay ecosystem.”)</p>	<p>Foundation; Speculation</p>
<p>¶84</p>	<p>Foundation; Speculation</p>
<p>¶¶92-93</p>	<p>Foundation; Speculation</p>