



# SJR fish kill investigation

- Started late May, reports tailing off 3<sup>rd</sup> week in June (>250)
- Species affected primarily adult redfish, stingray, catfish (white, hardhead), gar (longnose, Florida), baitfish (shad, menhaden)
- Species less (or not) affected e.g. croaker, spot, pinfish, silversides
- Fish kill differential by species and size class
- No other wildlife apparently affected
- Main area affected fresh to low salinity ( $\sim < 8.0$ ppt) reach from Colee Cove north to downtown Jacksonville
- No (rare) reports in Doctors Lake, rare north of Jacksonville
- Sporadic fewer fish kill reports south from Colee Cove to Palatka, down to Lake George
- Separate (connected?) fish kill & diseased mullet in Lake George
- Salinity spike (increase) (USGS data) late May at Buckman Bridge coincided with approximate start of fish kill



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- Cyanobacteria bloom *Aphanizomenon* cf. *flos aquae* appears restricted to freshwater and low salinity (<2.0ppt)
- Other cyanobacteria species present in fresh water (*Microcystis*, *Anabaena*) south
- Low to no level cyanobacteria toxicity (N = 1)
- Not consistent with low dissolved oxygen (levels normal)
- No other obvious WQ parameters (singly, but possibly synergistically)
- Possible WQ changes associated with *Aphanizomenon* blooms (e.g. high pH, ammonia [SJRWMD data]), currently not suggested at existing kill area, but further south
- Fish behavioral and pathological signs not consistent with cyanotoxin neurotoxins or hepatotoxins (e.g. microcystins, cylindrospermopsin, saxitoxin) – but not ruled out, diagnostics ongoing



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- Suspect cause toxicosis based on preliminary pathology (more work needs to be done to confirm)
- Completing diagnostics on fish (pathology, disease, hematology, pathogens)
- Reviewing possible connection between fish kill, cyanobacteria blooms or other HAB species (toxins, bioactive compounds [e.g. hemolysins]), WQ, by-products of bloom decomposition
- Review of available WQ and historical data (chemistry, biological) in conjunction with partners
- Review of fisheries data (why some species and size classes affected, not others?) and trophic dynamics
- Other environmental factors?

