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Mr. Drew Bartlett  
Deputy Secretary for Ecological Restoration  
Florida Department of Environmental Protection  
3900 Commonwealth Blvd.  
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April 28, 2016

Dear Mr. Bartlett:

A key component of the North Florida Regional Water Supply Plan – the North Florida-Southeast Georgia (NFSEG) Regional Groundwater Flow Model – is nearing completion. The NFSEG model will be central to all regulatory decisions made by DEP and by both the Suwannee River and the St. Johns River Water Management Districts (WMD) regarding groundwater extractions and springs protection in the region.

The Florida Springs Council (FSC) has reason to be concerned that the NFSEG model may not be adequately peer-reviewed before it is implemented. Last year, FSC sent the following public records request to all five water management districts:

*Please provide all documentation on file related to the following items concerning the use and application of groundwater models in your water management district:*

- 1. A listing of all groundwater models that are used by your District as part of regulatory decision-making and water-use planning. This listing should include all models used in the review and issuance of water-use permits, minimum flows and levels, prevention and recovery strategies, water supply plans, basin management action plans, and other similar activities.*
- 2. A description of the review process for each groundwater model. Specifically, please provide information on whether, and the extent to which, each model has been peer-reviewed by internal or external parties, the names of the reviewers, and the dates of the reviews.*
- 3. A copy of the documents related to any peer review and your district's responses to the review's comments and suggestions, including the changes in model simulations resulting from modifications based on the review's comments and suggestions.*

Responses from the WMDs were revealing. There was no uniformity whatsoever in how the five districts conducted peer-review of their models. One district in fact claimed that it uses no models at all in its water-related regulatory determinations. For some district models, there was no record of any peer-review, while in others both the peer-reviewers and the report that they produced appeared to be highly professional.

One constant, however, stood out in these peer-review exercises. Even when the reviews were conducted with care, there was little if any documentation of how the district in question responded to the peer-reviewers' comments and critiques. High-quality peer-review guidelines, such as those utilized by the U.S. Geological Survey (<http://www.usgs.gov/fsp/>), mandate that an agency whose science is being reviewed should respond to all peer-review suggestions with an explanation of whether, how, and why these suggestions did or did not result in modifications to the model being reviewed. This basic guideline is rarely if ever followed by Florida's WMDs in developing groundwater models. The most specific response to peer-reviewers' critiques that we found in reviewing WMD documents was a vague assurance that "...we intend to address these issues in the next iteration of the model".

State leaders – both elected officials and appointed environmental managers – repeatedly talk about the importance of sound science in developing environmental regulations. But by and large, the State's use of peer-review in evaluating groundwater models has not been characterized by a level of rigor that would justify use of the term "sound science".<sup>1</sup>

What would the FSC recommend regarding peer-review of the NFSEG model?

During consideration of the omnibus water bill (SB 552) approved in January, FSC noted that some groundwater models developed in the private sector might be more flexible and accurate than those currently used by WMDs. We recommended that the State should fund one or more of these outside models and suggested that qualified peer reviewers compare their usefulness with that of the State's models. [See amendment #16 from FSC's recommended amendment package: <http://springsforever.org/wp-content/uploads/2015/02/Springs-Bills-2016-Recommended-Amendments.pdf>.] The legislature chose not to include this amendment in SB 552, and WMDs have not followed our recommendation to fund alternative groundwater models.

The next best outcome, from FSC's perspective, would be to conduct rigorous peer-review on all groundwater models, using standards endorsed by USGS, and to involve the best peer-reviewers available, including those who have been critical of past modeling efforts by WMDs. **Specifically, we would strongly recommend that Dr. Todd Kincaid should be one of the peer-reviewers for the NFSEG model.**

You are familiar with Dr. Kincaid and his work, having hosted a lengthy meeting in Live Oak about two years ago when Dr. Kincaid discussed his views on the shortcomings of WMD approaches to groundwater modeling. Several WMD executive directors and senior modelers attended Dr. Kincaid's presentation. His credentials are impeccable – a Ph.D. from the University of Wyoming, founder and President of a successful consulting company, vast experience with groundwater and geology in North Florida, experienced cave diver. Dr. Kincaid's client list includes Fortune 500 companies as well as the Department of Energy, which hired him to assess groundwater flows in perhaps the most sensitive project imaginable – namely, our nation's primary nuclear testing site, the Nevada National Security Site (NNSS). If he were not at the top of his profession, Dr. Kincaid and his team would not have been hired at the NNSS.

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<sup>1</sup> See Dr. Robert Knight's comments on peer-review of groundwater models in: <http://www.gainesville.com/article/20160422/OPINION03/160429980/-1/opinion?Title=Robert-Knight-Flawed-models-used-to-permit-groundwater-pumping>

Dr. Kincaid, as you know, has been critical of the groundwater models developed by our State agencies. I don't speak for Dr. Kincaid, but it is safe to say that he believes that these models are neither state-of-the-art nor particularly accurate and that the State could do a much better job developing models, especially those like NFSEG that have significant regulatory import. Dr. Kincaid summarized many of his concerns in a talk to UF's annual water symposium in February of this year: <http://waterinstitute.ufl.edu/Symposium2016/downloads/presentations/kincaid.pdf>

No doubt, some WMD staff will bristle at the thought of a critic like Dr. Kincaid serving on the NFSEG peer-review panel. They shouldn't. Science proceeds most effectively when conflicting views are brought to the fore and debated. Any serious State modeler should welcome both Dr. Kincaid's input and the opportunity to engage him in serious back-and-forth discussions concerning alternative modeling approaches.

Last week, Scott Laidlaw and John Fitzgerald of SRWMD briefed Sierra Club representatives on the North Florida Regional Water Supply Plan and the NFSEG model. In that meeting, it was suggested that Dr. Kincaid would make an excellent peer-reviewer for the NFSEG model. The SRWMD representatives expressed some concern that Dr. Kincaid might be an inappropriate choice given his involvement in the technical meetings undergirding development of NFSEG. This should not be a serious concern. Dr. Kincaid attended only one of these technical meetings, and even then only to help Alachua County officials understand how the model might affect their county.

In the past, the public's lack of faith in the State's management of its water resources has led to numerous lawsuits and administrative challenges. A vigorous, open process for establishing groundwater models could reduce future challenges by enhancing the credibility of the process. FSC would strongly urge you both to utilize the strong peer-review procedures in your implementation of the NFSEG model and to retain Dr. Kincaid as a peer-reviewer for that model. It is critical that the model's limitations be identified, described, and honestly considered when making resource management decisions. Dialogue with critics can only improve the process and give your effort credibility.

Sincerely,



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CC: Dr. Ann Shortelle, St. Johns River WMD  
Mr. Noah Valenstein, Suwannee River WMD