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**Statement to the Faculty Senate regarding EHST 2110 (Introduction to Environmental Health) – 19 March 2002**

My name is Joseph J. Luczkovich, Associate Professor, Department of Biology and an Associate Scientist at the Institute for Coastal and Marine Resources. For 11 years, I have taught BIOL 1060 (Environmental Biology GE: SC), which is a course that is similar in content to the proposed Environmental Health course, but which differs in some important ways, as I will discuss below. Thus, I am perhaps the best qualified faculty member in the Biology Department to evaluate the proposed course, and its ability to meet the requirements set forth in the university catalog as a required science class.

I am here to state my objection to the acceptance of EHST 2110 for general education requirements in science (GE: SC) at ECU. My objection is based on two simple facts: (1) that the course, as described in the syllabus and textbook provided to me (exhibit A), does not cover the scientific method, and (2) it under-emphasizes ecology, which is the basic science on which the environmental sciences, including environmental health, is based.

The Scientific Method, which is the method by which one can distinguish possible explanations of phenomena in nature from impossible ones, is the hallmark of science. It is a common method to biology, chemistry, physics, and geology. It allows one to distinguish between a hypothesis (which is an educated guess) and a theory (which is a narrative of un-refuted hypotheses). Let me provide a familiar example: when one flies in an airplane, one relies on the *theory* of aerodynamics to arrive at the destination, not a *hypothesis* of aerodynamics. The theory of aerodynamics was derived by assembling all un-refuted hypotheses that physicists, materials scientists, and engineers have tested over the years since the Wright Brothers flew at Kitty Hawk. It is not simply a hypothesis that one might end up flying to Miami (or wherever) when one boards a plane, but a fact! Use of the terms "theory" and "hypothesis" are often intermingled by non-scientists (lawyers are notorious for this), but these two concepts should not be confused. A basic science class must cover this most important topic; no college-educated person should be graduated without understanding the difference between a hypothesis and a theory. (After all, some of these graduates will be on juries, planning boards, and school boards, where they will be asked to judge competing "theories"). Students in general education at ECU should understand all aspects (measurements and errors, quantification, etc.) of the

scientific method after taking a college-level science class. Examples discussed in class need to refer back to the scientific method. However, EHST 2110 (and the text listed by Anne Nadakavakaren, *Our Global Environment: A Health Perspective*) does not cover the scientific method in any detail. It would be as if a required English course failed to cover grammar, sentence structure, or spelling.

Secondly, the detail of the lecture topics and readings from the text leave much uncovered in basic ecology. I spend six weeks on the basics of ecology and evolution, which covers the first nine chapters in my textbook. Nadakavakaren compresses all of that material into one chapters in the text (I can't tell from the syllabus how long the instructor will take to cover that chapter, but the text is inadequate to provide enough detail for the students). This seems to be inadequate coverage of the basics science upon which one must build to understand all of the complexity involved in environmental science, especially when considering humans and their diverse cultures. For example, this textbook assumes that the student understand the process of natural selection when the topic of pesticide resistance is covered. In my experience, it takes non-biology major students quite a while to fully grasp the concept of natural selection and evolution. The process of pesticide resistance by insects cannot be fully understood without a solid foundation in the theory of natural selection and evolution. Policies and regulations regarding pesticide spraying must be understood in light of the basic science underlying pesticide resistance. Because of the poor coverage of natural selection, the average student will not be able to explain the scientific rationale (selection of pesticide-resistant strains of insects) underlying the restrictions in pesticide use as discussed in this text. Before I delve into environmental health, pollution and environmental policy, I review the basic science of ecology, along with related topics in physics, chemistry, and geology. It seems that the health perspective of the proposed course requires that the basic science of ecology be reduced in coverage, and this is not acceptable in a basic science class.

I want to state for the record that I do not think this proposed course is inadequate for a attaining a general education health requirement. In fact, I encourage the advocates for this Introductory Course in Environmental Health to explore that option for attracting students to their program. Nor do I think that the instructors are incapable of teaching an excellent, topical course in Environmental Health. Indeed they are well qualified. But I do

not think that this course meets the basic standard for a general education science requirement. Thanks for your time.

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