Minutes from the SAB Ecological Processes Standing Committee (EPSC) Meeting (March 5th, 2013)

1.) Opening statements made by Dr. Bob Hazen (Lead Liaison, NJDEP, OS); quick introductions made between each EPSC member in attendance and participating NJDEP staff.

- Brief introduction and overview of new Charge Question (No. 2): "Should the DEP research and test new statistical analysis methods with the potential to substantially decrease monitoring cost in the near future?", or alternatively "What statistical analysis methods should the DEP evaluate in order to assess the potential to substantially decrease monitoring costs in the near future?"

2.) Dr. Nick Procopio (NJDEP, Office of Science) provided an overview of the new issue in question, with some supporting examples and background of statistical approaches/monitoring costs of past and present projects. Dr. Procopio's discussion was divided into three broad categories: C1) the general use of GIS based geostatistical methods, C2) specific implementation of geostatistical methods, and C3) analysis of large continuous data sets.

3.) Committee began an open discussion of all talking points raised by Dr. Procopio; Dr. Z. Qiu felt that the most logical place to begin exploring the issue would be to have a few specific examples or projects in which to initiate comment and review. The main question, as voiced by others, include context: "how good are the methods/models given the inputs; need to know the purpose, scale, needs, temporal/spatial components, etc.,

- How would the inputs potentially influence policy?
- Need to look to see if monitoring programs within the Department can be enhanced or adjusted to become more efficient.

4.) D. Frizzera provided to the EPSC an overview with examples (i.e. Climate change/SLR predictive models) of how Department programs collect data, what the outputs are based on current regulations (both State and Federal) and available analytical and modeling techniques, and how conclusions derived from the models/data are used to inform decision making.

- DEP should provide three or four examples of programs and/or monitoring protocols that the EPSC can review and analyze. This would serve as the starting point for the EPSC to tackle the issues (e.g. Water quality data, SLR, Air, ENSP habitat mapping, etc.).
- Also, the need arises to analyze monitoring programs for cost vs. methodologies. Can the science help inform which strategies are the most efficient and cost effective (i.e. Where are the largest costs, technically – equipment, personnel, other)?

- B. Witherell from the Office of the Commissioner offered his services to provide analyses for monitoring costs and cost breakdowns for specific DEP monitoring programs; EPSC will need to choose which monitoring program it would like to examine.
- EPSC could look at the SAB Water Quality Standing Committee's work, perhaps review previous work/final report, focusing specifically on the monitoring components.

5.) Dr. J. Kennen offered a refined version of the charge question given the inputs provided by the discussion, emphasizing the need to focus the question: "Can NJDEP reliably use geospatial modeling techniques (e.g. Bayesian, etc.) to develop some predictive capacity that better informs decision making (cost-benefit) for monitoring at the state level? What parameters should be used across space and time (e.g. arsenic, water quality, PCBs, etc.)?"
    - Dr. Mihaela Enache suggested using the NJ Lakes Monitoring data (via the EPA databases), which could utilize current or novel geospatial modeling and analyses for the purpose of investigating impairments to water quality (i.e. diatoms).

6.) Category 2 (C2): What other states are using this approach? How successful were they? Who/what programs within the Department would benefit?

- Action item: EPSC to perform literature review and/or find datasets amenable to procedures for collecting and spatially/temporally analyzing water quality data, discovering data gaps, looking at standards, and testing sensitivity.
- Data/databases to be reviewed for modeling activity, reliability, and for validation efforts.
- EPSC to examine overall how these data/databases have been utilized and if they and/or the modeling to which they have been subjected be made more effective.
- Assignments for database investigation for 3/5/13 attendees is as follows:
    a. Meadowlands (C. Bentivegna)
    b. Barnegat Bay (U. Howsend)
    c. Passaic/Raritan (M. P. Weinstein, Z. Qiu)
    d. Lakes (M. Enache)
    e. Delaware River (R. Hoke)
    f. Delaware Bay (D. Frizzera)

7.) Category 3 (C3): Discussion of continuous data collection (e.g. data loggers); EPSC discussion of how to deal with voluminous data sets and examine ways in which data can be reduced to statistically acceptable standards. Dr. Procopio stressed the need to address the issue of data reduction with respect to statistical analyses where scientists use large data sets to extrapolate trends or into model input, others in agreement.
    - Could use literature to inform (mathematical approaches could be too labor intensive) what sub-set of data is most useful, and/or when there are too much data or too little (e.g. Monte Carlo Simulation); Need to investigate if sampling points are discrete or giving same information.

8.) Next meeting: to be determined via Doodle poll (April), will invite Dr. Leo Korn (NJDEP, Office of Science) to join next EPSC meeting. Meeting location to be at the USGS Facility on Bear Tavern Rd., Ewing, NJ.

SAB Members in Attendance:

- Michael Weinstein (Chair)
- Carolyn Bentivegna
- Zeyuan Qui
- Paul Bovitz
- Jonathan Kennen
- Ursula Howson
- Robert Hoke

NJDEP Staff:

- Bob Hazen, Lead liaison (OS)
- Joe Bilinski, Liaison (OS)
- Dorina Frizzera, Environmental Scientist (OS)
- Mihaela Enache, Research Scientist (OS)
- Nick Procopio, Research Scientist (OS)
- Ben Witherell, Director of Economic Analysis (OC)