



ATMOSPHERIC MERCURY DEPOSITION AT SELECTED NADP SITES

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ABSTRACT

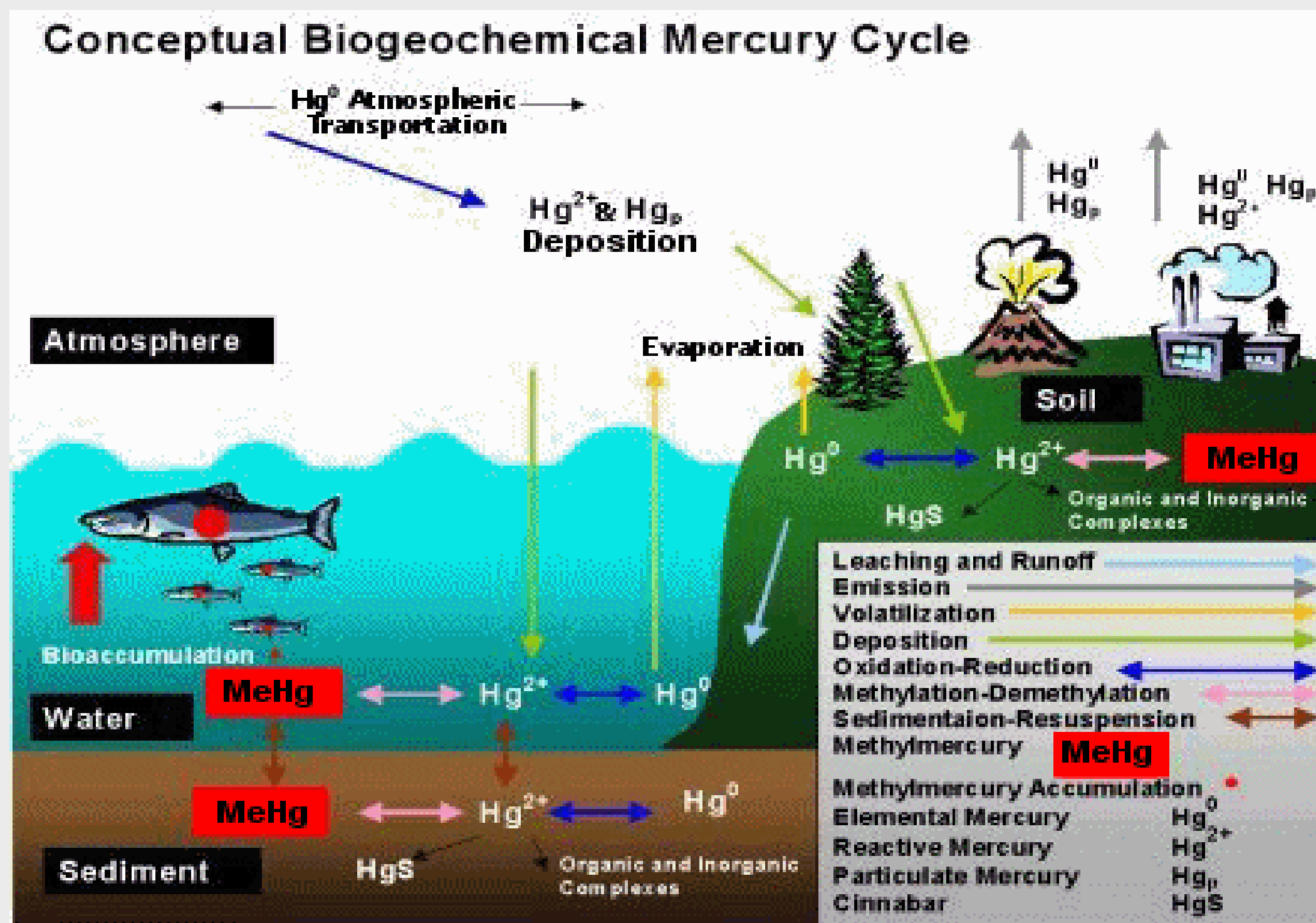
Human activities since industrialization have caused the amount of mercury formed in the environment to increase by a factor of 2-4. The goal of the Mercury Deposition Network (MDN) is to develop a network that adequately covers all continental ecoregions for accurate determination of wet mercury levels in the regions. This work presents a preliminary investigation into the atmospheric mercury deposition at selected National Atmospheric Deposition Program (NADP) sites at North Carolina A&T State University, (NC17); Lake Waccamaw State Park, (NC08); Savannah River Site, (SC03) and Congaree National State Park, (SC19), in the year 2015. The result of the investigation suggests that the mercury deposition increases as the weather becomes warmer.



Miranda Jackson at NADP Site NC17

INTRODUCTION

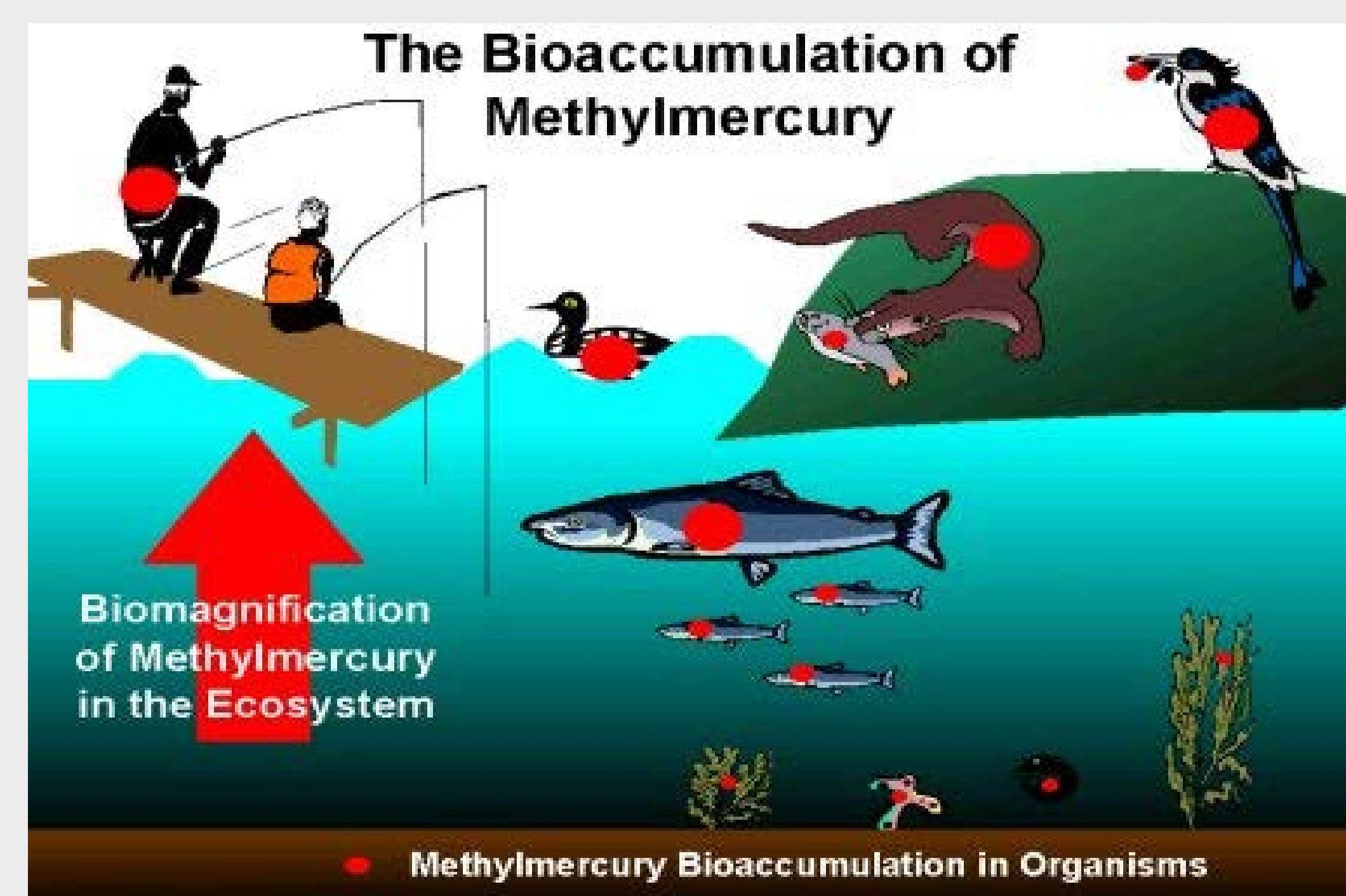
Mercury (Hg) belongs to the class of chemicals called persistent bioaccumulative toxins. Elemental mercury has atmospheric lifetime of up to two years during which it moves from one location to another until it gets buried in the soil where it stays as methyl-mercury (Me-Hg) for many decades.



Source: www.ec.gc.ca/mercure-mercury/

MERCURY IN FOOD CHAIN

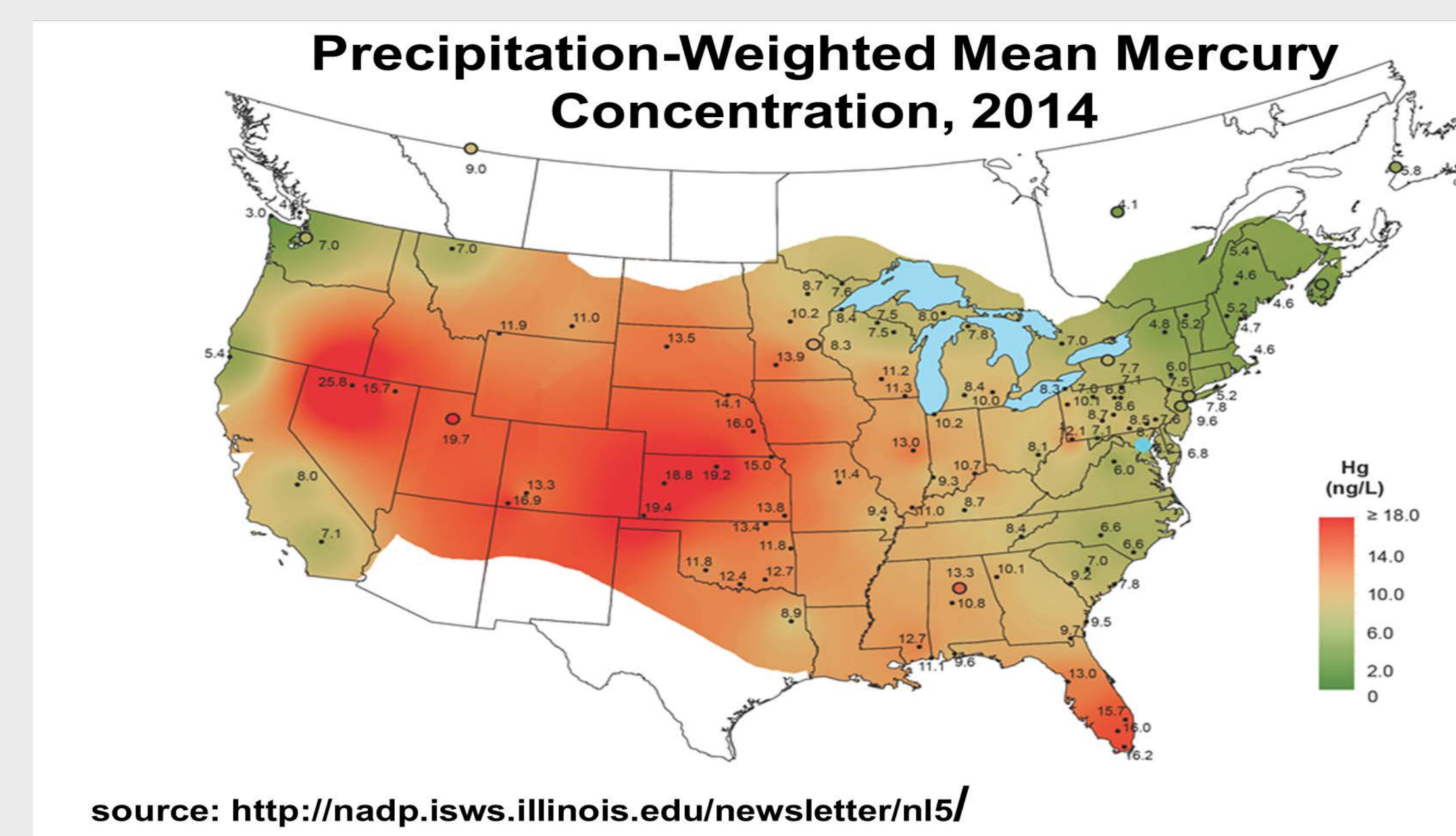
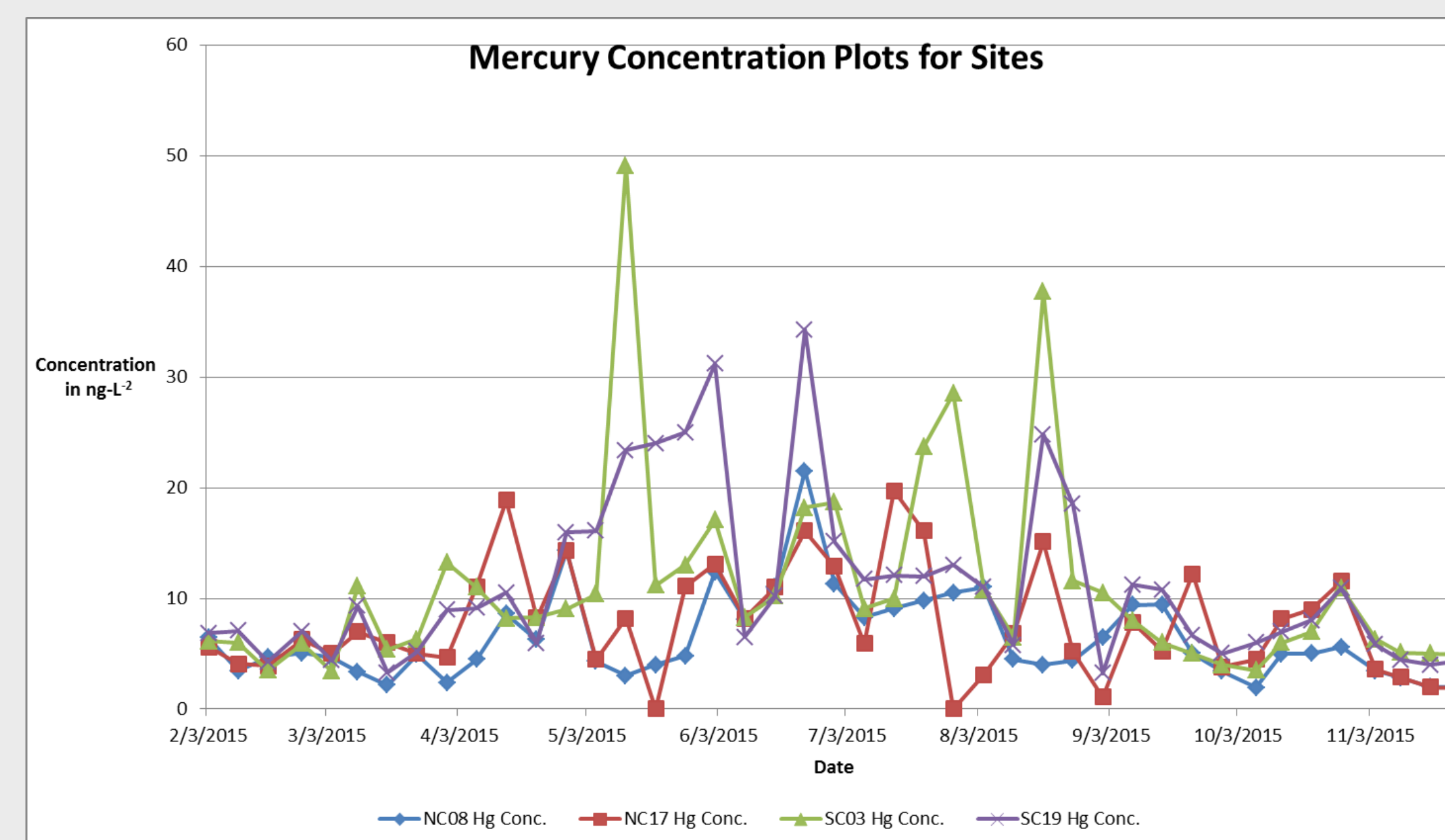
Mercury and methyl mercury though present in only very small concentrations in seawater, are absorbed, usually as methyl mercury, by algae at the start of the food chain. This algae is then eaten by fish and other organisms higher in the food chain. As humans consume fish, they also consume any Me-Hg in the fish. Humans bioaccumulate Me-Hg if they consume Me-Hg faster than their bodies can remove it. Mercury concentration in humans could be reduced by consuming less mercury-contaminated foods. This idea has led to the fish-consumption warnings for mercury.



Source: www.ec.gc.ca/mercure-mercury/

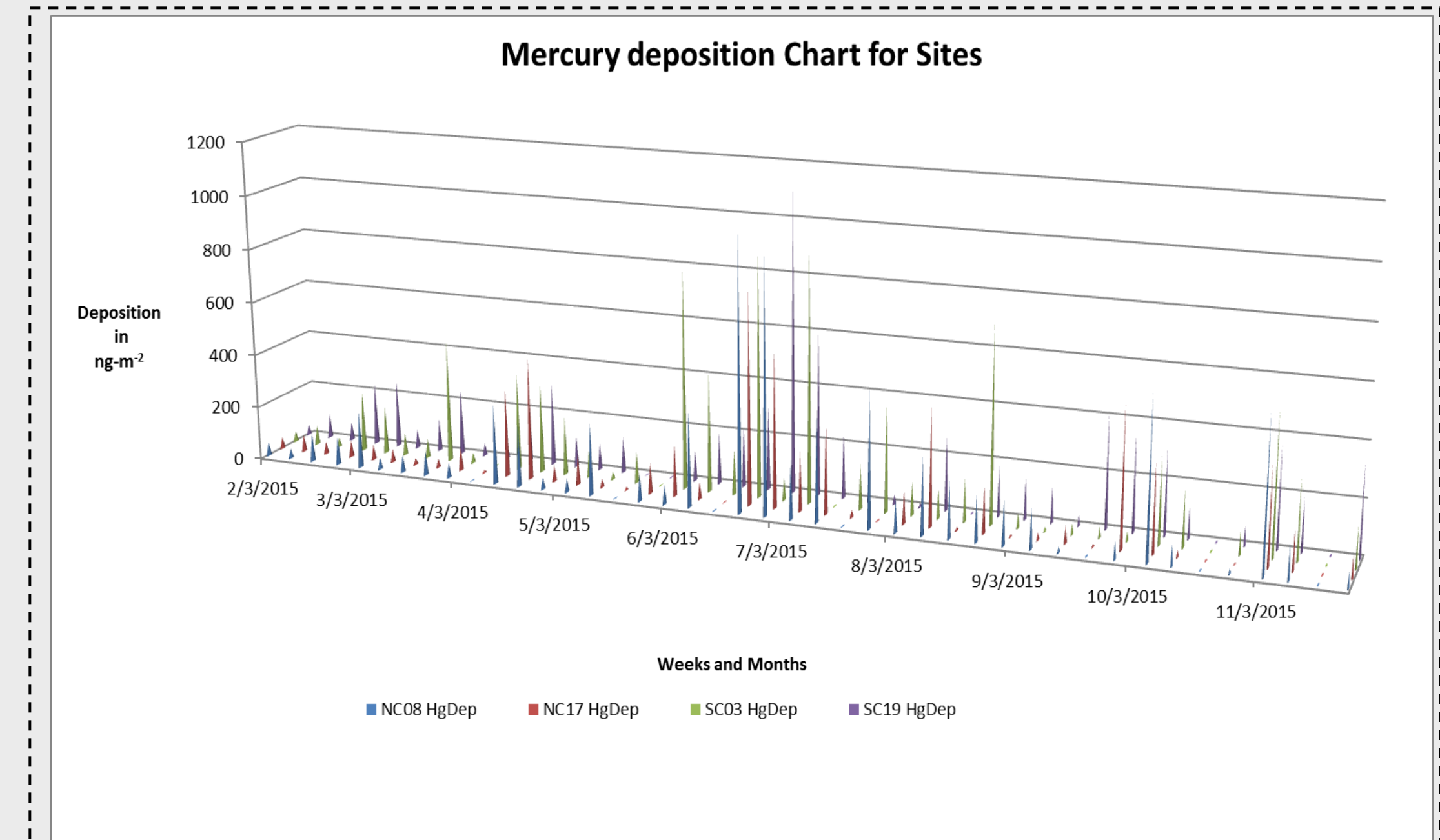
METHODOLOGY

Rain samples were collected weekly from the NADP sampling sites and sent to NADP laboratories for analysis. The analysis is aimed at determining the average mercury deposition in Nano-gram per square meter, which is a function of the mercury concentration in the air of the data collection locations. The site characteristics are as follows:
 NC08: located near Lake Waccamaw
 NC17: University Farm located near industrial and manufacturing operations
 SC03: located near nuclear materials
 SC19: located near old bottomland hardwoods



source: <http://nadp.isws.illinois.edu/newsletter/n15/>

Results

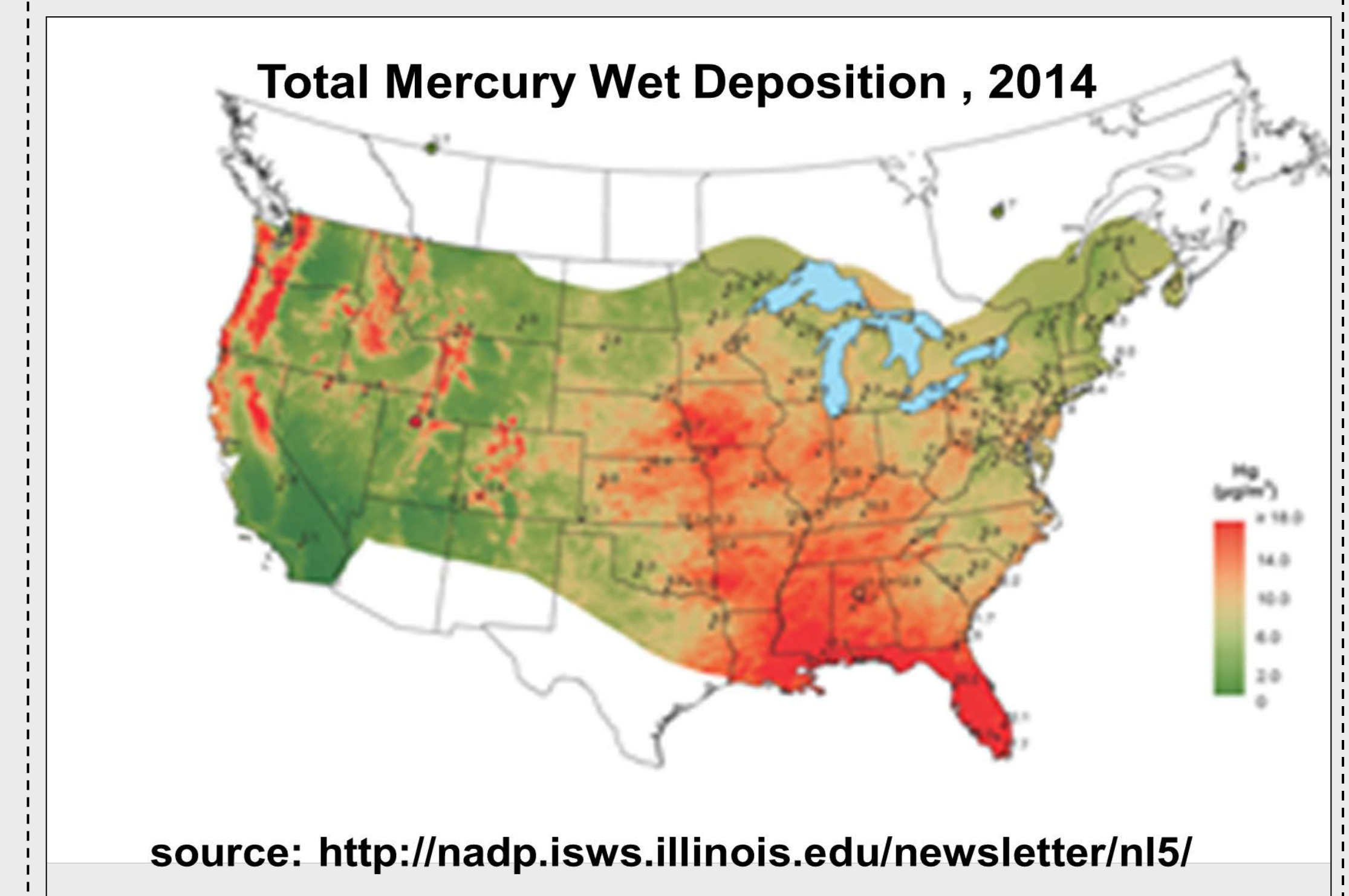


The lowest average Hg wet-depositions were recorded in the month of February 2015 and range from 53.7ng/m² at NC17 to 106.5ng/m² at SC19. The highest average Hg wet-depositions were recorded in the month of July 2015 and range from 325.72 ng/m² at NC17 to 592.95ng/m² at NC08. The individual highest weekly Hg wet-deposition occurred at SC19 in the month of July 2015.

The variation in Hg wet-deposition appears to be seasonal. Data suggests that mercury deposition increases as the weather becomes warmer. This observation also seems to hold true with mercury concentration.

Conclusion

This study adds to national scale measurements of atmospheric Hg deposition amounts, geographic distribution, and trends across Southeast United States and improves environmental quality.



source: <http://nadp.isws.illinois.edu/newsletter/n15/>

