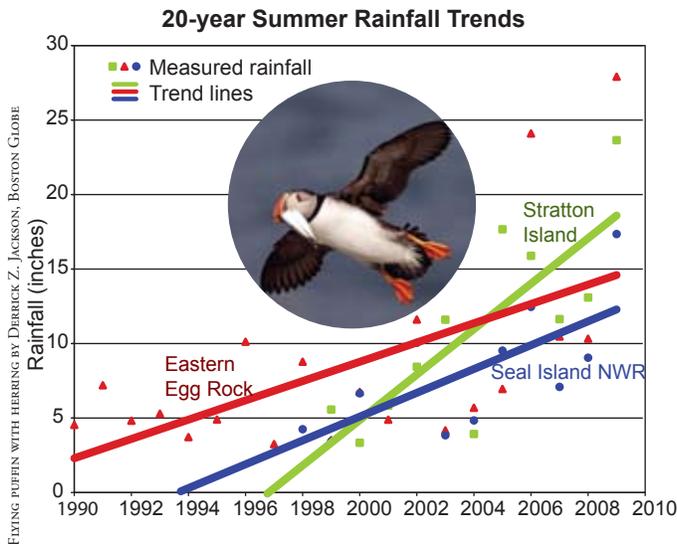


# EXTREME RAIN AFFECTS MAINE SEABIRD NESTING

## HERRING BUFFERS THE EFFECTS OF WEATHER

Extreme rains are a predicted outcome of global warming<sup>1</sup> and observations from this past summer are consistent with a pattern of wetter-than-usual summers on Maine islands. Yet even given this trend, summer 2009 was memorable for record-breaking amounts of rain. High rainfall usually results in poor seabird nesting, but this year the negative effects were countered on some islands by the exceptional amount of Atlantic herring that parent seabirds brought to their chicks.



While it's usually difficult to separate the effects of weather, from food and predator impacts on chick survival, this year the extreme weather and abundant herring were clearly dominant forces.

For example, last summer Eastern Egg Rock seemed to be sitting under more rain clouds than any of our islands. Interns recorded nearly four times the usual rainfall, with 27.9 inches of rain from late May to early August. This compares to an average of 7.4 inches during the same period for the previous 20 years. The rain and cool temperatures (daily highs averaged just 60° F.) especially affected the terns, whose surface nests are easily impacted by weather. Despite the extreme rain, most terns fared well through incubation and the first week following hatching. During this period, adults could shelter their eggs and small chicks under their bodies and wings. Rain that fell after the chicks were about a week old did the greatest damage, as the larger chicks were more exposed and their food demands were greater. At this age, chilling rains often lead to chick death through exposure.

Because of the chilling effects of rain, the appearance of a consistent and abundant supply of high-calorie herring was especially important this summer. Atlantic herring typically makes up about 20% of the Common Tern chick diet, but last summer, herring

comprised more than 50% of the chicks' diets across all islands.

At Eastern Egg Rock, herring, while more common than usual, still made up just 20% of the food delivered to Common Tern chicks. That inadequate amount resulted in only 0.7 chicks per nest fledging. Likewise, Arctic and Roseate Terns had the lowest productivity in eight years. Even puffins, which nest beneath a protective cover of boulders, had less nesting success, producing 0.79 chicks per nest, notably below the 21-year-average of 0.90 chicks per nest.

In contrast, islands with higher proportions of herring and less rain had much higher nesting success than Egg Rock. At Stratton Island, for example, Common Terns fledged 1.74 chicks per pair, far better than the island's typical average of just one chick per pair. This excellent productivity occurred despite 23.7 inches of rainfall from early May to early August. Here the diet of tern chicks contained 42% herring—more than twice that received by Egg Rock chicks

## HURRICANE BILL

In late August, Hurricane Bill roared up the Atlantic coast. It missed a direct hit to Maine, but the storm created 20-foot waves that flooded about two-thirds of the puffin nesting habitat at Seal Island NWR. This thriving new puffin colony was fortunate as most of the puffin chicks had fledged just before the storm. Apparently, the abundant herring which nurtured this year's puffins helped the chicks fledge earlier than usual. This near-miss was another reminder

of how vulnerable Maine's puffin nesting islands are to flooding from storms and predicated ocean level rise from melting Arctic ice.

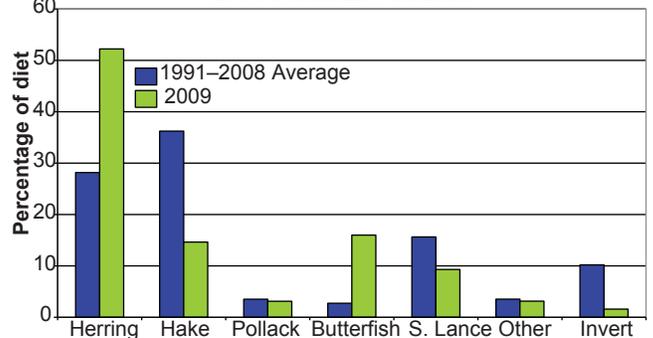
An expanded version of this article is available on line in the *Egg Rock Update* archives at [www.projectpuffin.org](http://www.projectpuffin.org).

<sup>1</sup>Richard P. Allan and Brian J. Soden 2008. Atmospheric Warming and the Amplification of Precipitation Extremes. *Science*. Vol. 321, 5895:1481–1484.



*A Common Tern chick peeks out from under the protective cover of its parent during a summer rain shower.*

## Foods Delivered to Common Tern Chicks 1991–2009 at Seven Maine Islands



*In 2009, herring increased to record high amounts in tern chick diets.*