Environmental Case Study
A Flood of Pigs:
NC Aquatic Dead zone from floods after Hurricane Floyd

October, 1999

Eastern North Carolina

North Carolina, the US’ leading hog producing states, is also home to the nation's highest concentration of hog manure-holding lagoons in a flood plain. In October 1999 those lagoons washed out in the flooding following Hurricane Floyd. The waste, mixed with the floating bodies of between 30,000 and 100,000 dead hogs, and with waste from flooded sewage plants, choked coastal rivers and washed into Pamlico and Core Sounds. There the waste created a 350-square mile dead zone, devoid of oxygen and of life, in the nation's second largest estuary. The state's $1 billion fishing industry is expected to suffer severely as a result of the flooding.

No one was surprised when the manure lagoons washed out. Statistically, North Carolina receives heavy rains and flooding after hurricanes as often as any other state on the eastern seabord. At the same time, the state has had explosive growth in the hog producing industry, producing 10 million animals a year by 1999. Many of the hog producers are located on the flat, flood-prone coastal plains and the river flats of eastern North Carolina. Environmental regulations on waste management are relatively lenient. Hogs are raised in barns holding thousands of animals each—many farms produce more waste than a small city. Because these facilities are agricultural, though, they are overseen by the Department of Agriculture, which requires little or no processing or purification of waste materials. Liquid manure is normally spread on fields, where growing vegetation, ideally, takes up the excess nitrogen before it washes into groundwater or surface waterways. Every year there are dozens of significant lagoon spills, some of which have resulted in major fish kills. The floods after Floyd were only the most recent and most serious in a long series of lagoon spill catastrophes.

In addition to the hogs killed in the floods, about 2 million chickens and 700,000 turkeys were drowned in the aftermath of Floyd.

The governor of North Carolina has asked Congress for $5.3 billion in disaster relief aid, to rebuild hog barns and lagoons on the coastal plain as well as to help rebuild houses in the area.

To read more, see

Environmental Science, A Global Concern, Cunningham and Saigo, 5th ed.
Canadian cod fishery decline: page 213
Fish farming (alternative fishery source): page 218

Environmental Science, Enger and Smith, 6th ed.
Fishery management: pages 201-203
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For further information, see these related web sites:

Report from the Washington Post
Hog Watch: Environmental Defense Fund information on hog farming
General report from Salon.com