THE UNIVERSITY of NORTH CAROLINA at CHAPEL HILL

The Bingham Facility

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Environmental Review Commission
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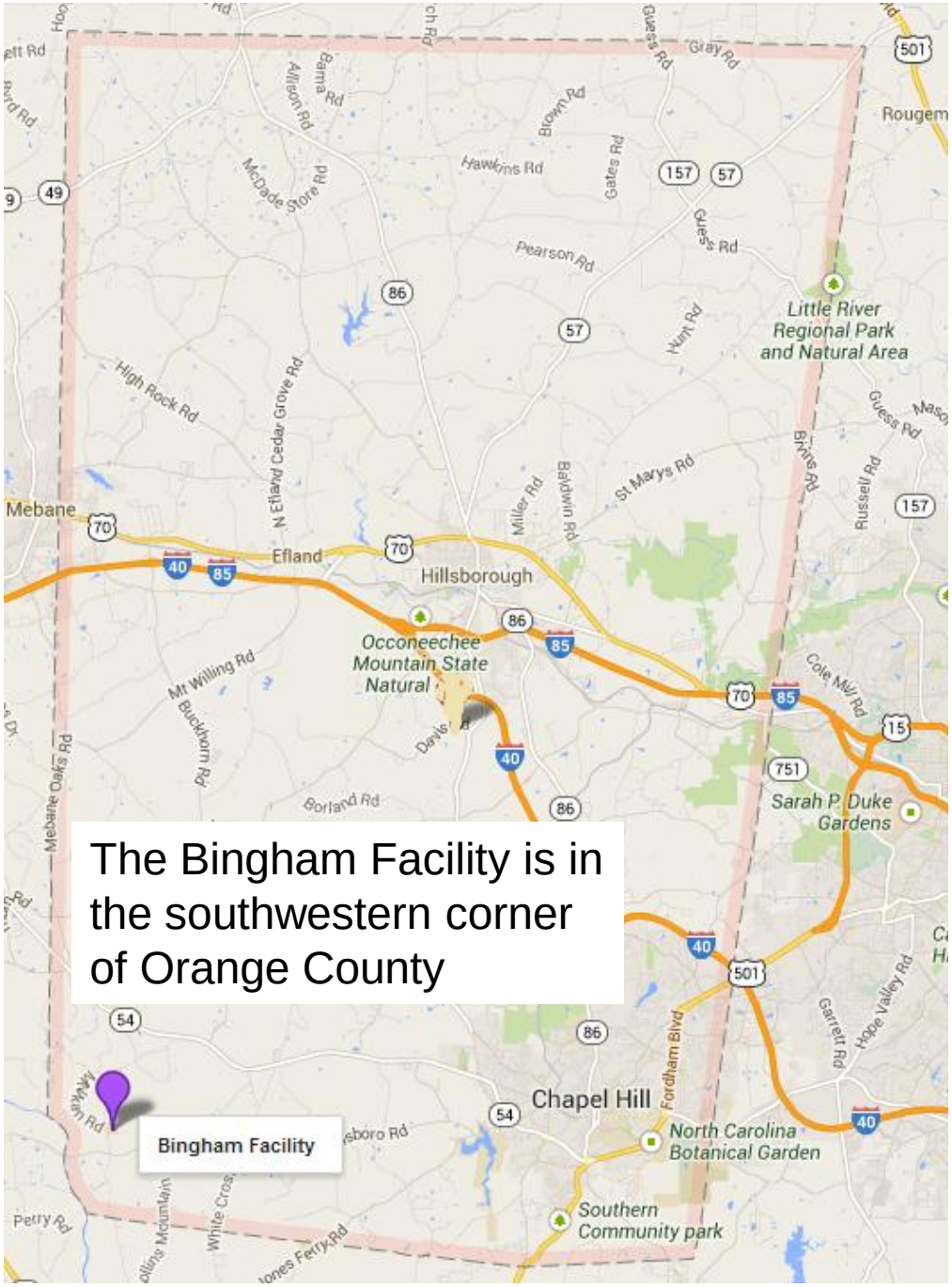
The Bingham Facility

The facility was built in the 1970s on a 56-acre, mostly wooded tract owned by the University in rural Orange County.

It began as one building and pasture for large research animals, like dogs and pigs, similar to a farm.



The Bingham Facility is in the southwestern corner of Orange County

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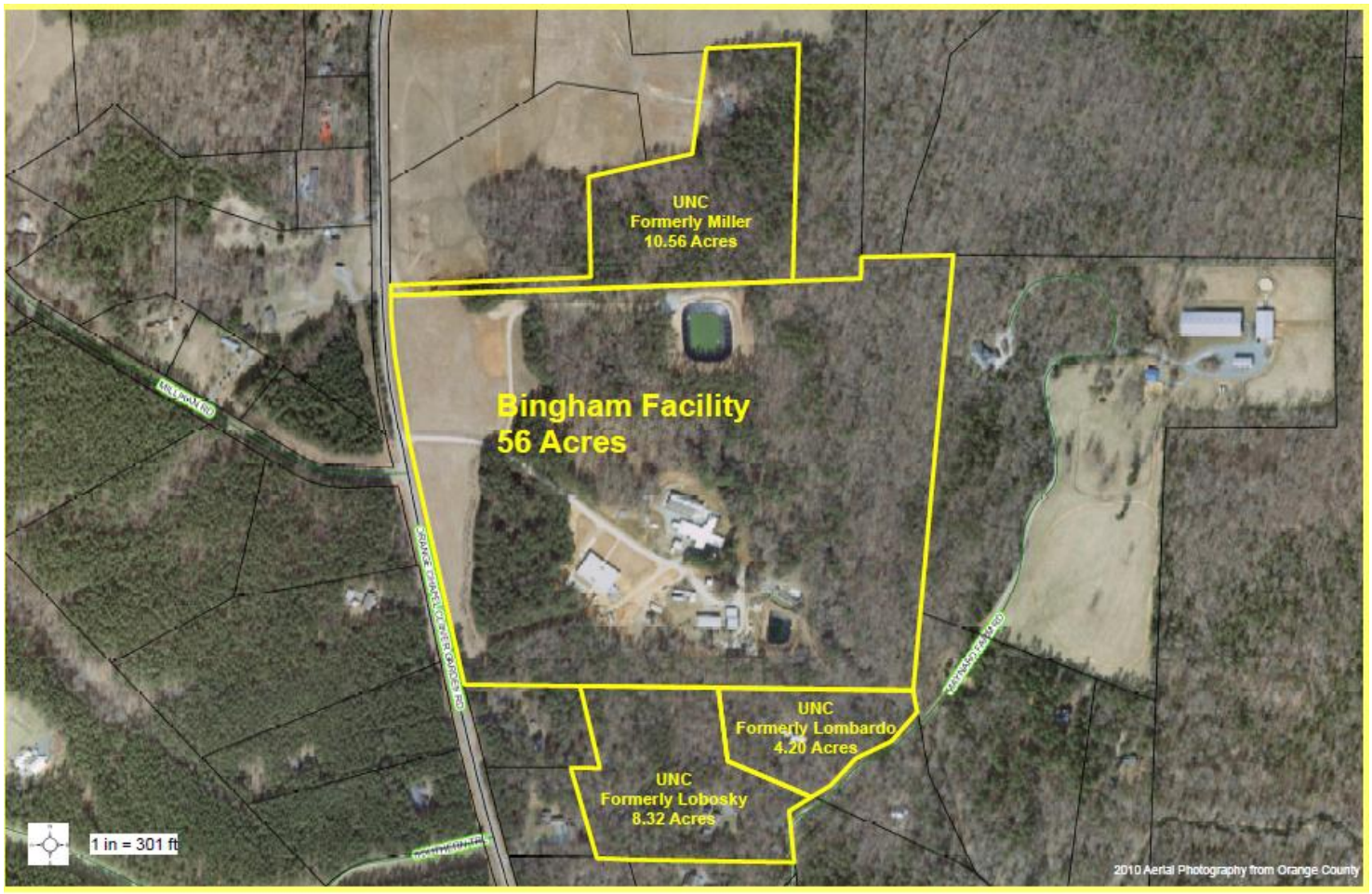


Now the Bingham Facility consists of three buildings to house animals, a wastewater treatment system and basins for holding treated wastewater. This aerial view also shows three buffer UNC properties.

The Bingham Facility

- Designed to house large animals in keeping with its rural surroundings
- Also serves as a place to observe new animals before bringing them in contact with research animals on campus

These were the primary reasons for choosing a site in rural Orange County, separate from the main campus in Chapel Hill.

The Bingham Facility

Since the 1970s, this rural facility has been a vital part of Carolina's research mission. Shown here are the original building (white) and a second building (gray), constructed in 2007.

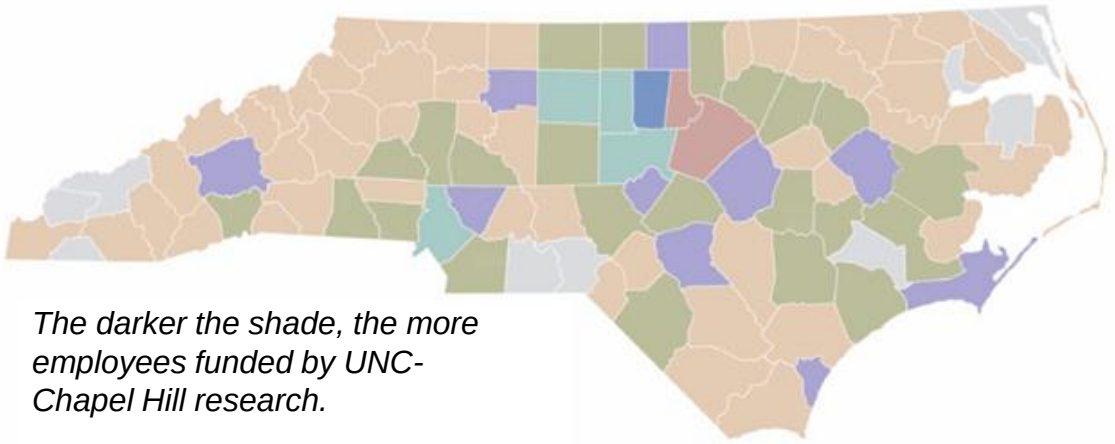
Carolina is a national leader in research

Based on the most recent available data, Carolina ranks:

- 1st (in a 7-way tie) among the nation's public research universities (Top American Research Universities, 2011)
- 9th in federal Research & Development expenditures (National Science Foundation or NSF, 2012)
- 11th in overall Research & Development expenditures (NSF, 2012)
- 7th among all universities in Health and Human Services expenditures, including the National Institutes of Health (NSF, 2012)
- 42nd among the world's top 400 universities (*Times Higher Ed.*, 2012–13)
- 20th among U.S. universities and 31st in world ranking (University Ranking by Academic Performance, 2012)

Carolina research means support and jobs for NC

- **$79 million** in technical assistance and support provided to professionals, public officials and organizations in NC
- More than **5,000 full-time jobs** funded
- At least **13,230 jobs** created annually throughout NC



The darker the shade, the more employees funded by UNC-Chapel Hill research.

UNC-Chapel Hill research dollars pay the salaries of employees in almost every North Carolina county.

Carolina research also translates into **healthcare benefits** and **quality of life improvements** for residents of every county in North Carolina.

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School of Medicine Research

At Carolina, the academic unit that receives the most research funding is – by far – the **School of Medicine**.

UNC SCHOOL OF MEDICINE

$391.5 million from all sources in 2012

51 percent of all UNC-Chapel Hill research funding

School of Medicine Research

At Carolina, the academic unit that receives the most research funding is – by far – the **School of Medicine**.

UNC SCHOOL OF MEDICINE

50 percent of School of Medicine's research funding goes to animal research

95 percent of the research animals at Carolina support School of Medicine research

Studying blood disorders and heart disease

One of the first and longest-running NIH grants (1947-1999) went to a UNC researcher studying blood disorders. The work of **Dr. Kenneth Brinkhous** (left) continues today at UNC, led by **Dr. Timothy Nichols,** (below).

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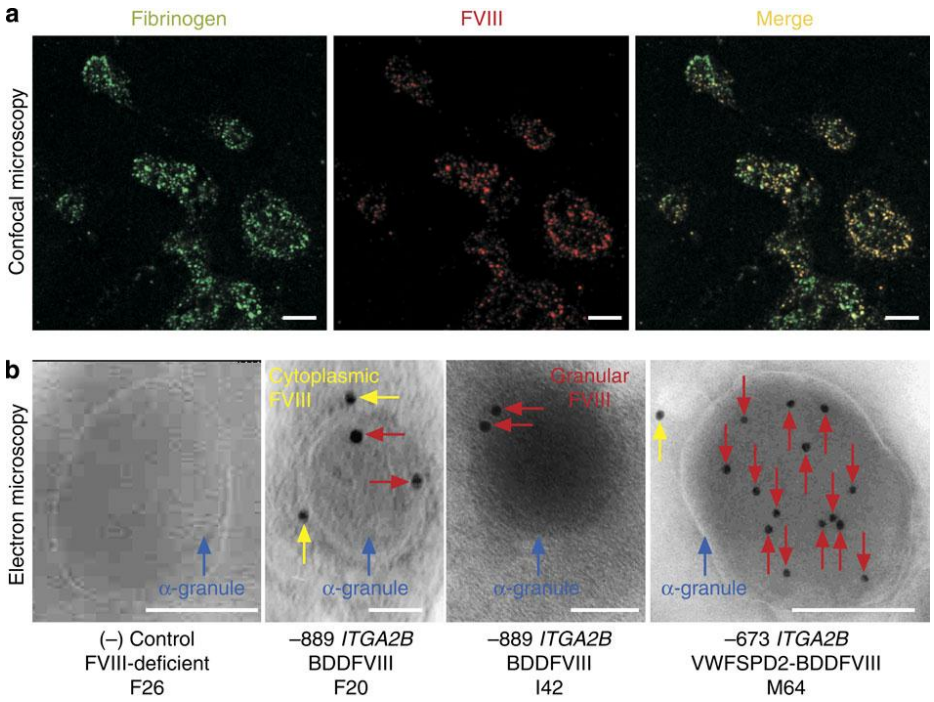
Studying blood disorders and heart disease



This figure shows the synthesis and trafficking of BDDFVIII into canine platelet α-granules.

Colonies of dogs born with bleeding disorders, such as **hemophilia** and **von Willebrand disease**, help researchers develop gene therapy for dogs as well as humans.

To learn more about thrombotic disorders related to **atherosclerosis**, **heart attacks** and **strokes**, researchers study pigs.

These large animals have been housed at the Bingham Facility.

New study results announced just last month

New gene therapy proves promising as hemophilia treatment

December 10, 2013

Researchers at the UNC School of Medicine and the Medical College of Wisconsin found that:

- a new kind of gene therapy led to a dramatic decline in bleeding events in dogs with naturally occurring hemophilia A, a serious and costly bleeding condition that affects about 50,000 people in the United States and millions more around the world.
- Before the gene treatment, the animals experienced about five serious bleeding events a year. After receiving the novel gene therapy, they experienced substantially fewer bleeding events over three years, as reported in the journal *Nature Communications*.

The Bingham Facility

The colonies of dogs that support this research live here.

The Bingham Facility

Previous Expansion Plans

A second building to house animals was built on the Bingham property in 2007.

In 2008, the School of Medicine planned to expand the rural facility with four more buildings:

- To consolidate dogs from the Francis Owen Blood Research Laboratory at Bingham for easier veterinary care and less travel
- To replace leased space in Hillsborough that housed a different colony of dogs used to study muscular dystrophy
- To accommodate current research using other large animals

The Bingham Facility

Expansion Mistakes

- Miscalculations of the amount and type of wastewater generated and total amount of water needed for operations resulted in a plan that could have severely stressed the Bingham Facility site.
- Further, the new wastewater treatment system installed at that time was undersized for the buildings that were proposed.
- Plastic linings in wet weather storage basins failed.
- Some road and basin construction encroached on 0.14 acre of wetland areas without appropriate permits.

The Bingham Facility

Results of Expansion Mistakes

- The failure of the plastic lining of the large wet weather storage basin led to a slow leak of highly treated wastewater that eventually reached a Collins Creek tributary, resulting in DENR violation and fine.
- Frozen and burst pipes led to a leak of highly treated wastewater and a DENR violation.
- 0.14 acre encroachment on wetlands resulted in US Army Corps of Engineers citation and required mitigation of impacts.

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Lessons Learned

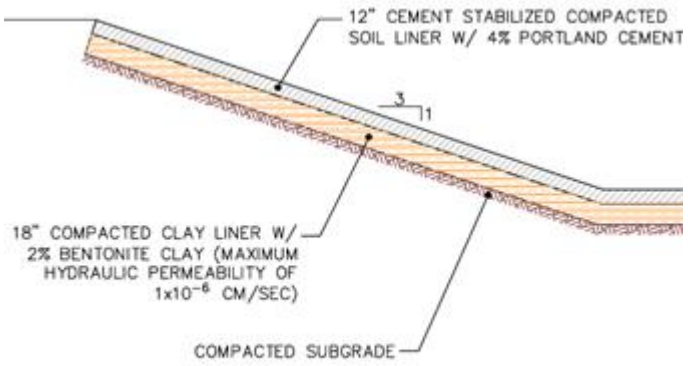
- We canceled the construction of three of the four planned buildings and returned construction grant money to NIH.
- We stopped using the site wastewater systems and are removing it and replacing it with a new site wastewater drip irrigation system.
- We restored or mitigated impacts on wetlands.
- We determined we did not need to increase overall water use.

New drip irrigation system replaces old spray irrigation system.

The Bingham Facility

Lessons Learned

- We redesigned the system, drained the wet weather storage basins, removed the plastic liners and are rebuilding the basins with clay liners.
- After a public hearing, we received a new permit from DENR.
- We are managing animal waste differently.



New clay lining is 1.5 feet thick.

Dry bedding reduces water usage.

The Bingham Facility

Lessons Learned

- We purchased the three adjacent properties most directly impacted by our activities at Bingham.
- These properties are NOT part of the Bingham Facility. They are fenced off and managed separately as rental properties by the UNC Property Office.

We have NO PLANS to expand the Bingham Facility beyond the current 56-acre tract.

The Bingham Facility

Lessons Learned

- We began meeting and communicating with neighbors and Preserve Rural Orange.
- We posted permits and correspondence on the Bingham website.

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Visit the Bingham Facility website at:
http://www.unc.edu/community/bingham.html

The Bingham Facility

Lessons Learned

- We added extensive landscaping that will—in time—provide a better shield between Bingham and its nearest neighbors.
- We have taken aggressive steps to reduce the noise of chillers and fans on site and to reduce night lighting—all to minimize the impact of Bingham on its neighbors.

Thank you for your time
and attention.

I would be pleased to
respond to your questions.

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