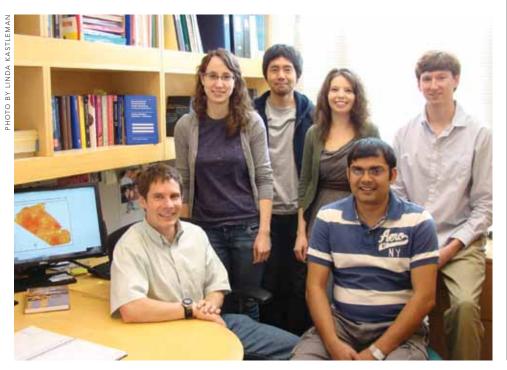
Disease mapping

to pinpoint, predict and prevent epidemics

M arc Serre, PhD, associate professor of environmental sciences and engineering at UNC Gillings School of Global Public Health and director of the UNC-BME (Bayesian Maximum Entropy) lab, was captivated by the Black Death pandemic that killed half of the people in Europe during the Middle Ages. To learn from history, he applied 21st-century geostatistical technology to analyze the disease's chilling, killing impact across space and over time.



Serre applies the same research methods in medical geography to study reasons for the prevalence of two major health concerns in North Carolina – chronic asthma in children and STDs and HIV/AIDS in males. According to state health statistics, an astounding 10 percent of North Carolina's children are living with asthma, struggling to breathe, awakening with chest tightness, and coughing through the night. In 2009, according to the U.S. Centers for Disease Control and Prevention, North Carolina had the ninth highest number of diagnosed AIDS cases in the country.

Serre's urban and rural area disease mapping provides clear, concise graphic analyses to document those at risk by pinpointing high rates of outbreaks in counties, even by zip codes, up to a year before epidemics may take hold. He consults with the N.C. Department of Health and Human Services about disease surveillance strategies for essential interventions and resource allocations based on his high-risk predictions.

"My students," Serre says, "share a passion for exploring environment-related public health issues, choosing careers to benefit our residents' well-being."

- IB Shelton

Serre's disease-mapping successes share a common thread with the work of Steven R. Meshnick, MD, PhD, who is featured in "Tracking Tropical Disease," Carolina Public Health (spring 2010), page 20.

Dr. Marc Serre (seated, left) consults about a disease-mapping project with fellow researchers (I-r) Jeannette Reyes, doctoral student; Dr. Yasuyuki Akita, postdoctoral fellow; Lani Clough, master's student; and Prahlad Jat (foreground) and Kyle Messier, doctoral students. All work or study in the environmental sciences and engineering department.