# Chapter 1 Introduction and motivation

## Spatial analysis for Epidemiology studies

## Motivating Examples

### Birth Defects in MA

### PFOA in Washington

# Chapter 2 Statistical background

## Overview of Disease mapping methods

## Mixed effects models

# Chapter 3 GAM with stratified Kernel smoothers

# Chapter 4 Additive mixed models with Kernel smoothers

# Chapter 5 Generalized additive mixed models with kernel smoothers

# Discussion