



# Historical Buildings and Religious Concentrations in Boston

Ben Tunney



# Argument

Prevalence of historical buildings in a Boston neighborhood is correlated with the maintenance of a religious group's places of worship.



## Secondary Questions

01

### RELIGIOUS CONCENTRATIONS

Where do concentrations of specific religious groups exist in Boston?

02

### BUILDING FEATURES CORRELATION

Which features of closely-located buildings correlate most strongly to maintained religious concentrations?

03

### CONCENTRATIONS OF OTHER FEATURES

Where do concentrations of features like historical buildings exist within Boston?

# Data

- Boston Parcels Dataset
  - Shape data for buildings
- Boston Buildings Dataset
  - Features for 98,930 buildings
- Boston Neighborhoods Shapefile
  - Shape representations of Boston neighborhoods

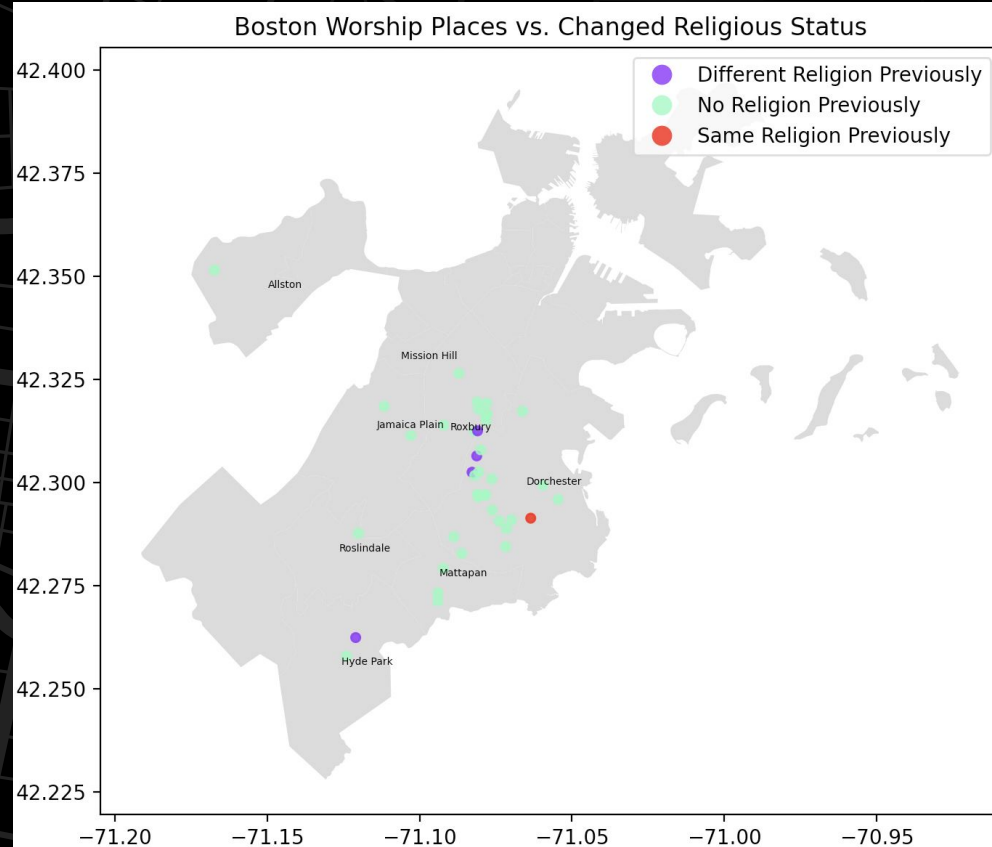
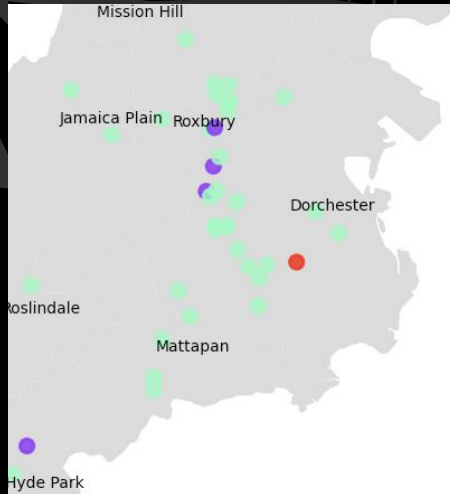
# Data for Historical and Religious Analysis

- Geocoded data using parcel centroids
- Manually labeled data
  - Historical religious state - atlascope
  - Religious grouping
- Small subset
  - Join parcel and buildings datasets
  - Null values
  - Ambiguous on atlascope
- Most labelled points fall within a concentrated area
  - Dorchester
  - Roxbury
  - Jamaica Plain
  - Mattapan
  - Mission Hill

	A	B	C	D	E	F
	Worship Place Name	Address	Street	Typ	Historical State	Religion
1	CAO DAI TEMPLE OF BOSTON INC	107	SPENCER	ST	No Religion Previously	Cao Dai
2	FAITHFUL CHURCH	81	LUCERNE	ST	No Religion Previously	Christian
3	COMMUNITY GOSPEL CENTER	8	INTERVALE	ST	No Religion Previously	Christian
4	CHURCH IN GOD OF CHRIST INC	14-18	FESSENDEN	ST	No Religion Previously	Christian
5	METROPOLITAN BAPTIST CHURCH	5	MIDDLETON	ST	No Religion Previously	Christian
6	MT CALVARY HOLY CH	15	OTISFIELD	ST	Different Religion Previously	Christian
7	UNIVERSAL CHURCH INC	761 765	DUDLEY	ST	No Religion Previously	Christian
8	ANOINTED FIRE CHURCH	777 781	WASHINGTON	ST	No Religion Previously	Christian
9	HOLY TABERNACLE CH OF GOD	14	BISHOP JOE	WY	Different Religion Previously	Christian
10	BETHEL CHURCH OF GOD 7TH DAY	1537	BLUE HILL	AV	No Religion Previously	Christian
11	ROMAN CATH ARCH OF BOS	20	ROSELAND	ST	Same Religion Previously	Christian
12	WASHINGTON LUTHER L	20	MICHIGAN	AV	Different Religion Previously	Christian
13	ANOINTED BAPTIST CHURCH INC	126	ARLINGTON	ST	Different Religion Previously	Christian
14	LAPRIMERA IGLESIAS DE DIOS	3251 32	WASHINGTON	ST	No Religion Previously	Christian
15	NEW LIFE RESTORATION TEMPLE	40	CENTRE	ST	No Religion Previously	Christian
16	MT CALVARY HOLY ASSEMBLY #1	297	TALBOT	AV	No Religion Previously	Christian
17	MASON REVEREND L DIRECTOR OF	205 211	HAROLD	ST	No Religion Previously	Other
18	DORCHESTER CHURCH OF CHRIST	1505	BLUE HILL	AV	No Religion Previously	Christian
19	JOY AND GLADNESS PENTECOSTAL	107 105	HARVARD	ST	No Religion Previously	Christian
20	CHURCH OF GOD OF PROPHECY	179	GLENWAY	ST	No Religion Previously	Christian
21	ZION ASSEMBLY APOSTOLIC	191 185	GLENWAY	ST	No Religion Previously	Christian
22	GLOBAL REACH EVANGELICAL	53	ERIE	ST	No Religion Previously	Christian
23	CASA GLORIOSA INTERNACIONAL	28	MARION	ST	No Religion Previously	Christian
24	LIFE CHANGING EVANGELICAL	165	BLUE HILL	AV	No Religion Previously	Christian
25	DANTLEY AURIE O	241 245	BLUE HILL	AV	No Religion Previously	Christian
26	WALTHAM CHAPEL	234 236	BLUE HILL	AV	No Religion Previously	Christian
27	FIRST UNITED PENTECOSTAL	1205	HYDE PARK	AV	No Religion Previously	Christian
28	CHURCH OF PENTECOST	3	BIGELOW	ST	No Religion Previously	Christian
29	NEW FAITH MISSIONARY	66	GENEVA	AV	No Religion Previously	Christian
30	CHRIST APOSTOLIC CHURCH	276	BLUE HILL	AV	No Religion Previously	Christian
31	ETHIOPIAN EVANGELICAL CHURCH	2574 25	WASHINGTON	ST	No Religion Previously	Christian
32	NEW FELLOWSHIP CHRISTIAN	27	VICTORY	RD	No Religion Previously	Christian
33	FIRST HISPANIC BAPTIST	10	KINGSBORO	PK	No Religion Previously	Christian
34	GABER MENFES KUDUS ERITRIAN	32 34	MAYWOOD	ST	No Religion Previously	Christian
35	GREATER FRIENDSHIP MISSION	111	HARVARD	ST	No Religion Previously	Christian
36	ROX PRESBYTERIAN CH	330	WARREN	ST	No Religion Previously	Christian
37	FRIENDSHIP APOSTOLIC	271 275	WASHINGTON	ST	No Religion Previously	Christian
38	MOUNT JOY CHURCH OF	88 94	ERIE	ST	No Religion Previously	Christian
39	TROUNG BAO XUAN	7	GREENWOOD	PK	No Religion Previously	Buddhist
40	FREEDOM IN CHRIST MINISTRY	651 655	WASHINGTON	ST	No Religion Previously	Christian
41						

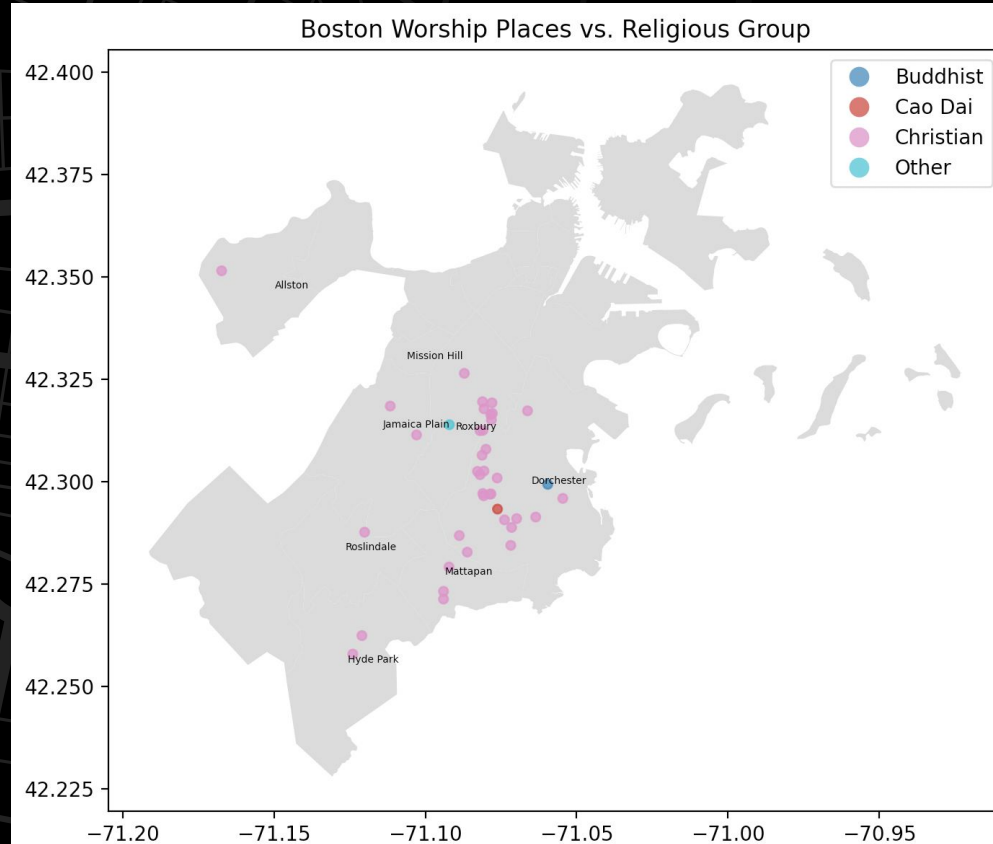
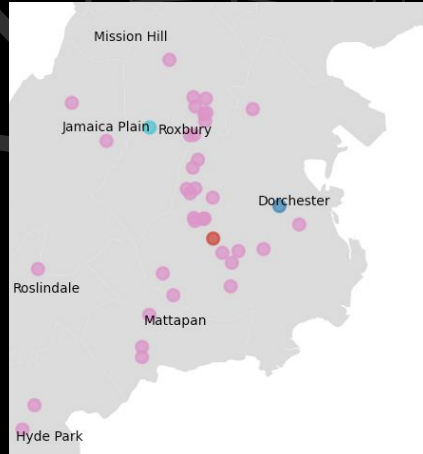
# Labeled Worship Locations - Initial Analysis

- Only 1 maintained location
- 4 maintained religious buildings
  - Concentration in Roxbury



# Labeled Worship Locations - Initial Analysis

- Predominantly Christian
- 3 Non-Christian places of worship



# Methods

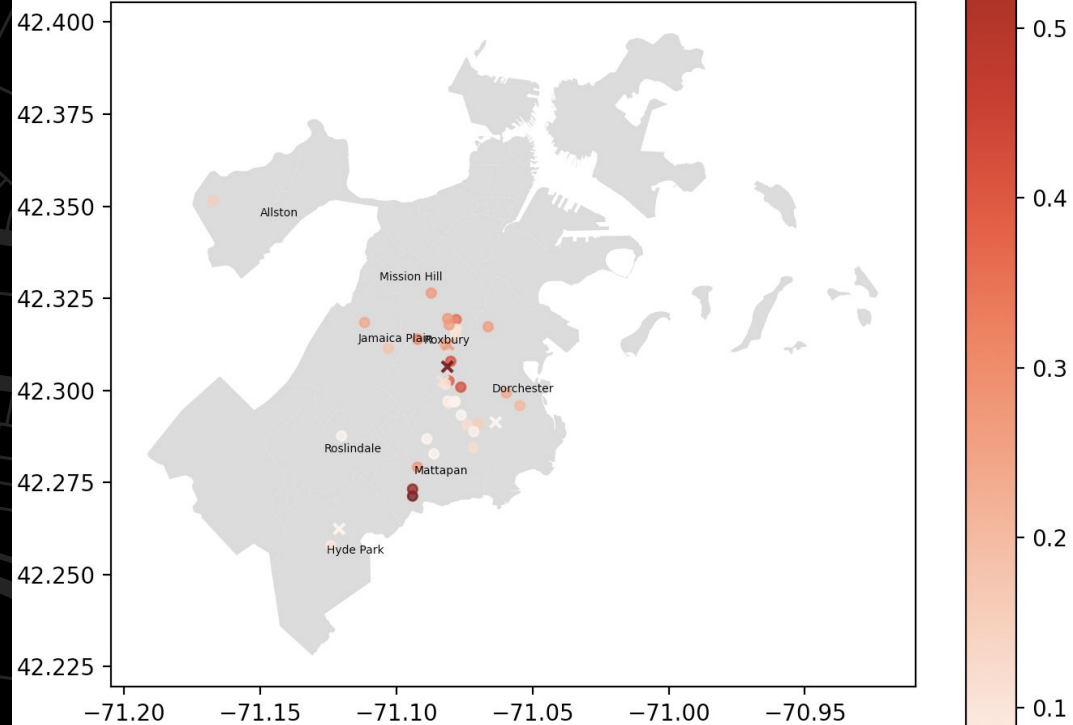
1. Get geographic data for all buildings in boston
  - a. 12,681 points
2. Get distances between all buildings
  - a. KDTree from SciPy Library
3. Get 100 nearest buildings to each place of worship
  - a. Calculate values for each 100 buildings
    - i. Average last year renovated
    - ii. Average original build year
    - iii. Percentage of buildings with asbestos
    - iv. Percentage in historical districts
    - v. Percentage with brick exterior
4. Visualize
  - a. Scatterplot
  - b. Correlation Heatmap
  - c. Swarmplot



# Brick Exterior

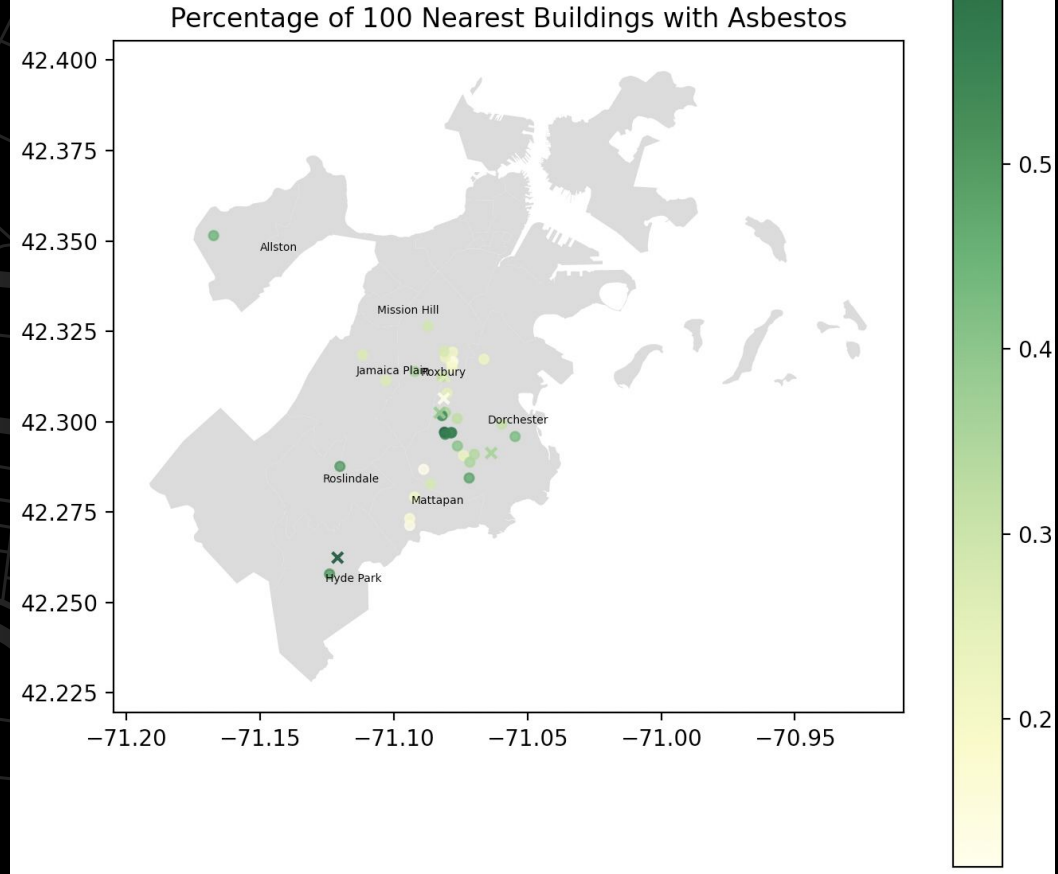
- Percentages inconsistent with maintained religious buildings
- More brick in Roxbury

Percentage of 100 Nearest Buildings with Brick Exterior



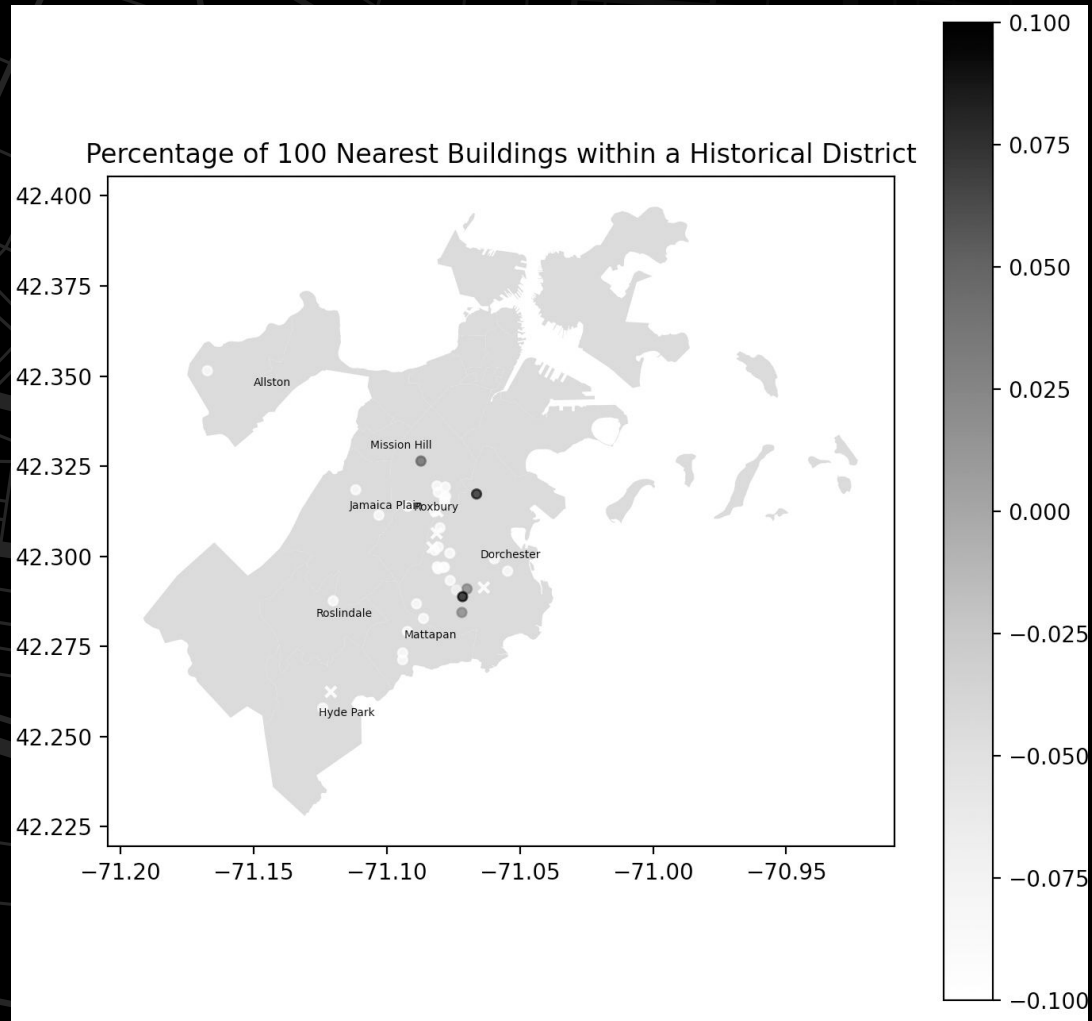
# Asbestos

- Percentages inconsistent with maintained religious buildings
- More asbestos in Lower Roxbury and Hyde Park



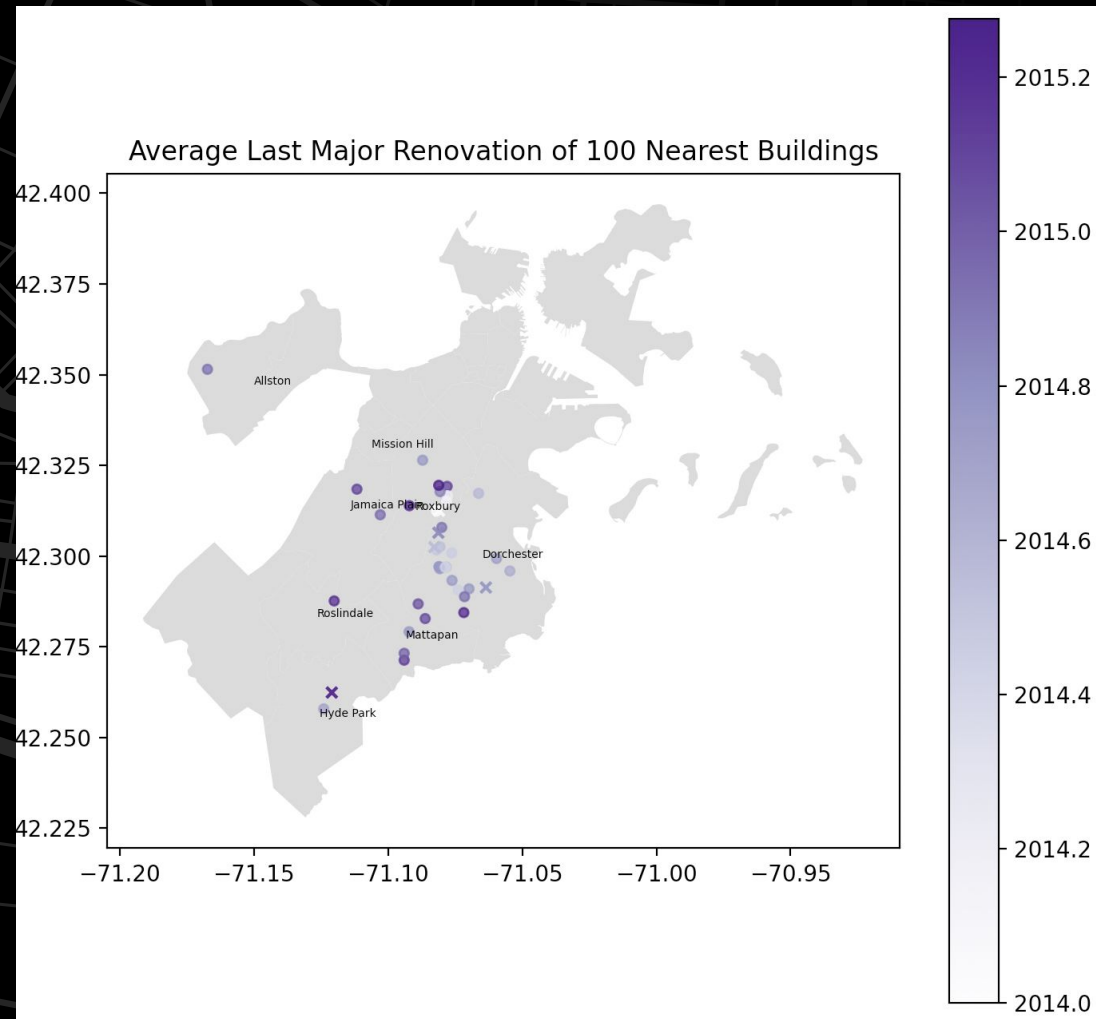
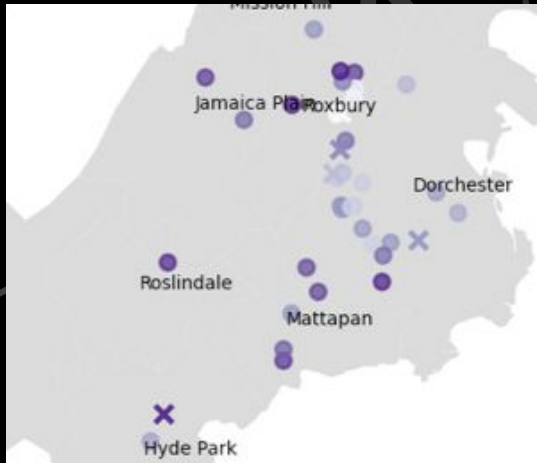
# Historical Districts

- All maintained religious buildings hold low percentages
- Highest percentages near lower Roxbury and Dorchester



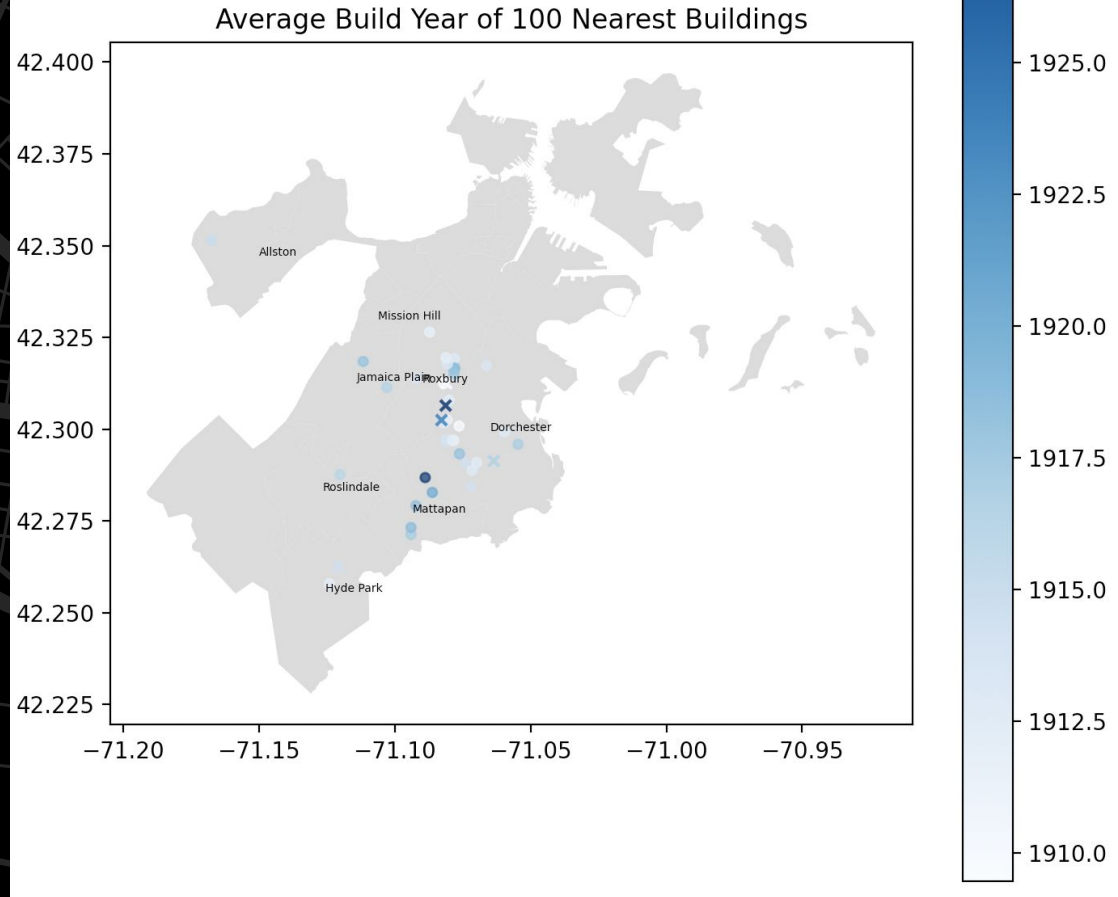
# Last Major Renovation

- Averages similar among all worship places
- Averages equally distributed amongst maintained religious buildings
- Oldest buildings in Roxbury



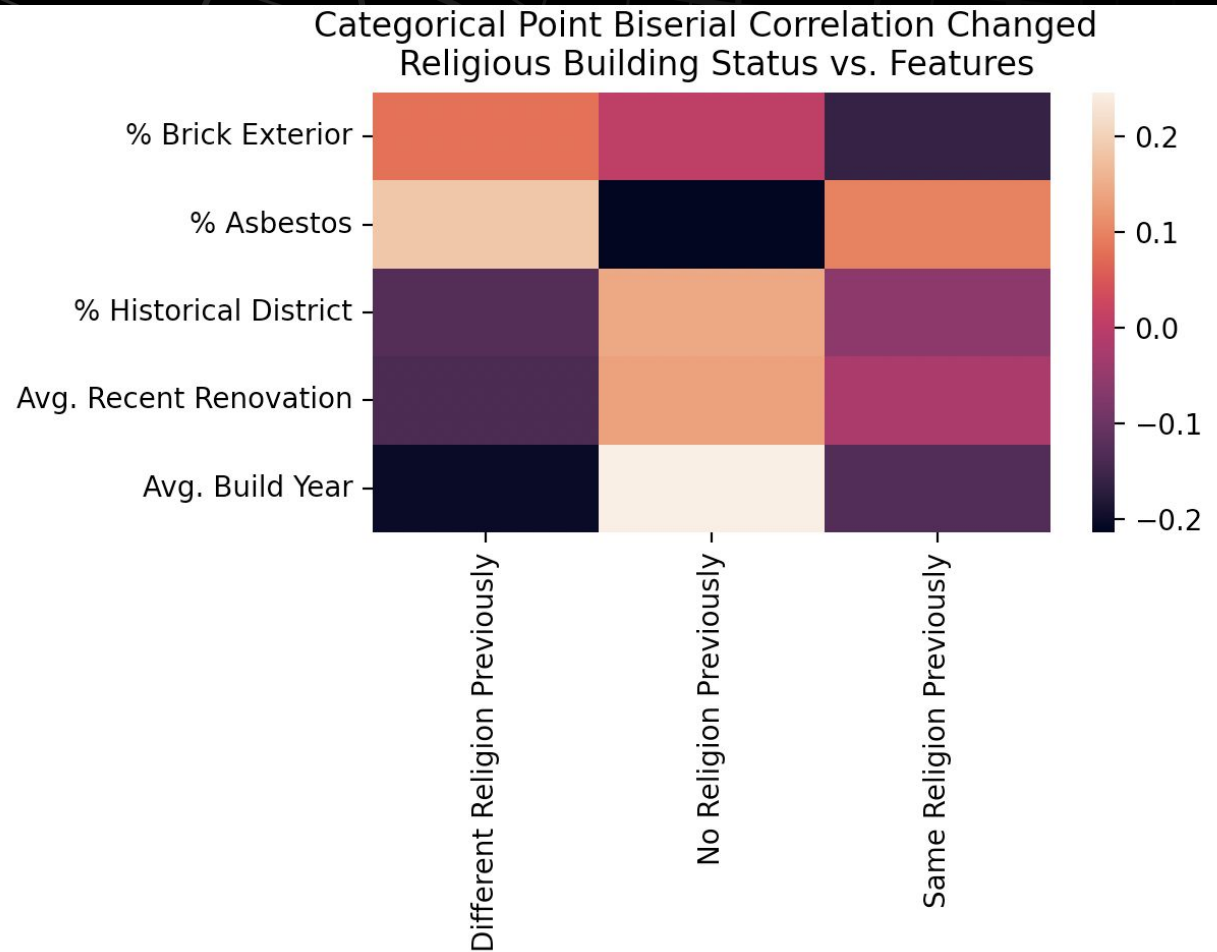
# Build Year

- Averages equally distributed amongst maintained religious buildings



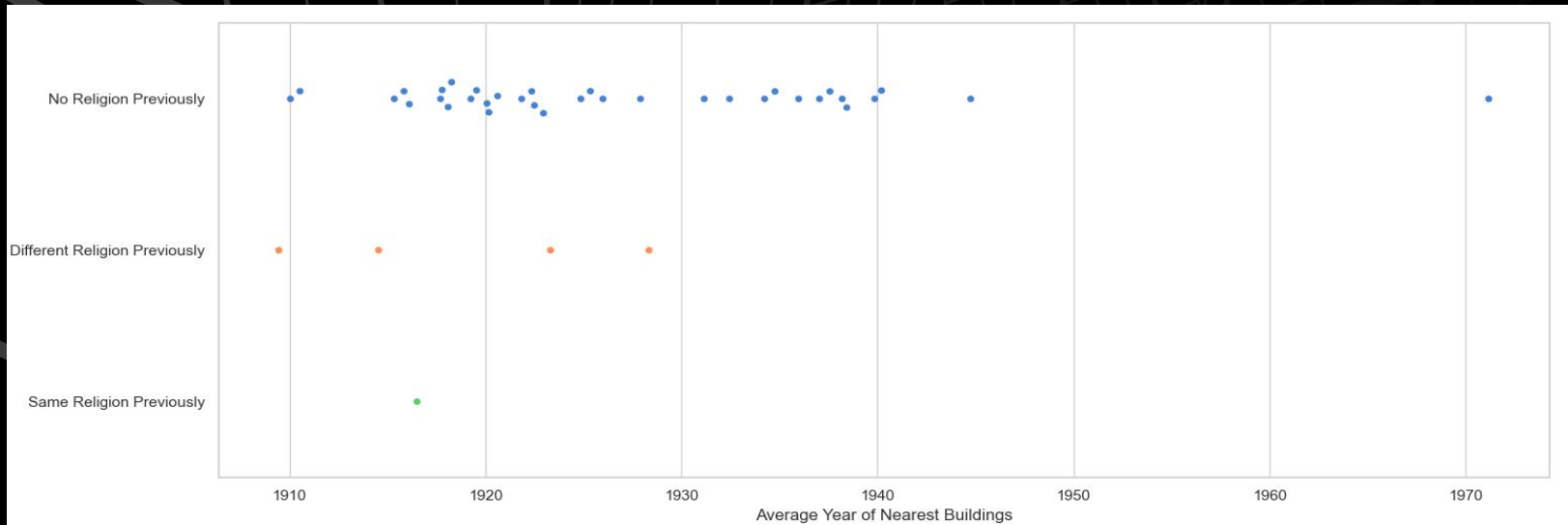
# Correlation

- Few positive correlations
- Potential relation behind no religion previously and avg. build year



# Average Year Built vs. Building Religion Change

- Some relation between maintenance of religious buildings and average build year
- Insufficient evidence



## FUTURE WORK

01

### DATA

Find more complete data  
for religious places

02

### RELIGIOUS DEMOGRAPHICS

Explore historical/current  
religious demographics

03

### INTERACTIVITY

Interactive scatterplots for  
further data inspection

04

### HISTORICAL RESEARCH

Look into what caused  
religious concentrations/shifts



# RESOURCES

- Geographic plotting
  - <https://towardsdatascience.com/plotting-maps-with-geopandas-428c97295a73>
- KDTree Distance Calculation
  - <https://stackoverflow.com/questions/45127141/find-the-nearest-point-in-distance-for-all-the-points-in-the-dataset-python>



Thank You