

21st Annual GIS/CAMA Technologies Conference Chattanooga Convention Center

GIS/CAMA • Chattanooga, TN



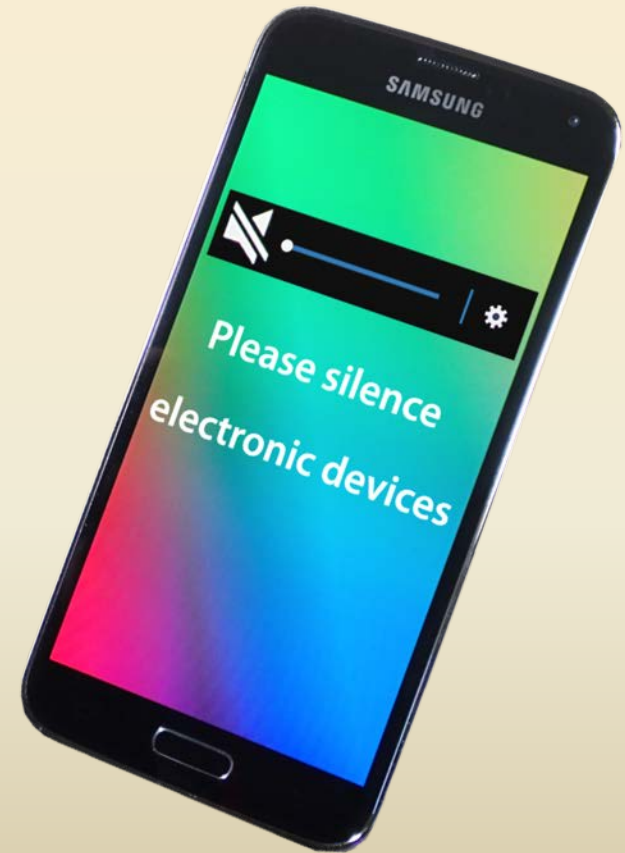
March 6-9, 2017

Continuing Education (CE) Credit

Recertification Credit forms for CE credit can be collected from the Registration Desk on Thursday.

Housekeeping

The conference proceedings will be available approximately 8 weeks after the conference.



Exploring the Attitude-Behaviour Profiles of Jamaican Property Taxpayers

Research Team:

**Tina Beale, Rochelle Channer Miller,
Cadien Murray-Stuart and Amani Ishemo**
University of Technology, Jamaica



PRESENTATION OUTLINE

- 1. Background and Scope of Presentation**
- 2. Property Tax Compliance in Jamaica**
- 3. The Property Tax System**
- 4. Research Methodology: sample cohort, survey locations, the structure of the survey, matching tax attitudes and behaviour.**
- 5. Spatial Analysis of Compliance: limitations & ethical considerations, compliance maps, tax attitude-behaviour profiles within collectorates**
- 6. Concluding Remarks**
- 7. References**



BACKGROUND & SCOPE OF PRESENTATION

- **Our presentation today is based on the data collection techniques and findings of a study that was funded by the Lincoln Institute of Land Policy. The study was conducted by the research team over the period April 2015- May 2016.**
- **Specifically, the presentation will focus on the data collection process that is required when trying to analyse the compliance/evasion phenomenon by using GIS technology in a developing economy.**
- **The presentation will also highlight the benefits and limitations of using GIS when conducting tax compliance research. This will be done by using 2 case study locations – Buff Bay, Portland & Constant Spring, St. Andrew.**



PROPERTY TAX COMPLIANCE IN JAMAICA

- Jamaica's property tax compliance rate generally hovers between 50 - 60% as compared to developed countries with compliance rates greater than 90% (*Thomas, 2015 cited in Eubanks, 2015*).
- The property tax earns 0.3% of GDP in Jamaica. In Latin America the tax revenue earns 0.8% of GDP. In emerging economies the property tax earns 1% of GDP and in developed countries 2.25% of GDP (*Bird & Slack, 2002; IMF, 2016*).



THE JAMAICAN PROPERTY TAX SYSTEM

- **Stemming from its colonial influences, the institution of local government was established in Jamaica since 1662 – poor relief and road maintenance (*McCluskey & Franzsen, 2001*).**
- **Since 1865, the system has remained unchanged until there was the creation of 14 Parish Councils and an expansion in the role of local government – KSAC, Portmore Municipal Council & 12 Parish Councils (*McCluskey & Franzsen, 2001*).**



THE PROPERTY TAX SYSTEM: TAX BASE

- **Legislative framework of the property tax – the Tax Collection Act 1867, Quit Rents Act 1896, Parochial Rates and Financing Act 1900, Property Tax Act 1903, Land Valuation Act 1957, Land Taxation (Relief) Act 1959 (*Wynter, 2014*).**
- **The system evolved from a SAS, to one where the tax base is the unimproved value of the land.**
- **Land values are determined through revaluation exercises. Revaluation exercises are completed on a ten year cycle- 1974, 1983, 1992, 2002, 2013 (*Sjoquist, 2007*)**



THE PROPERTY TAX SYSTEM: TAX RATES

Value Band JMD	Applicable Rate JMD	Value Band USD	Applicable Rate USD
Up to \$100,000	flat rate of \$1000	Up to \$850.00	flat rate of \$8.50
Over \$100,000.00 up to \$1,000,000.00	additional 1.5% for every additional dollar	Over \$850.00 up to \$8,500.00	additional 1.5% for every additional dollar
Over \$1,000,000.00	additional 2.5% for every additional dollar	Over \$8500.00	additional 2.5% for every additional dollar

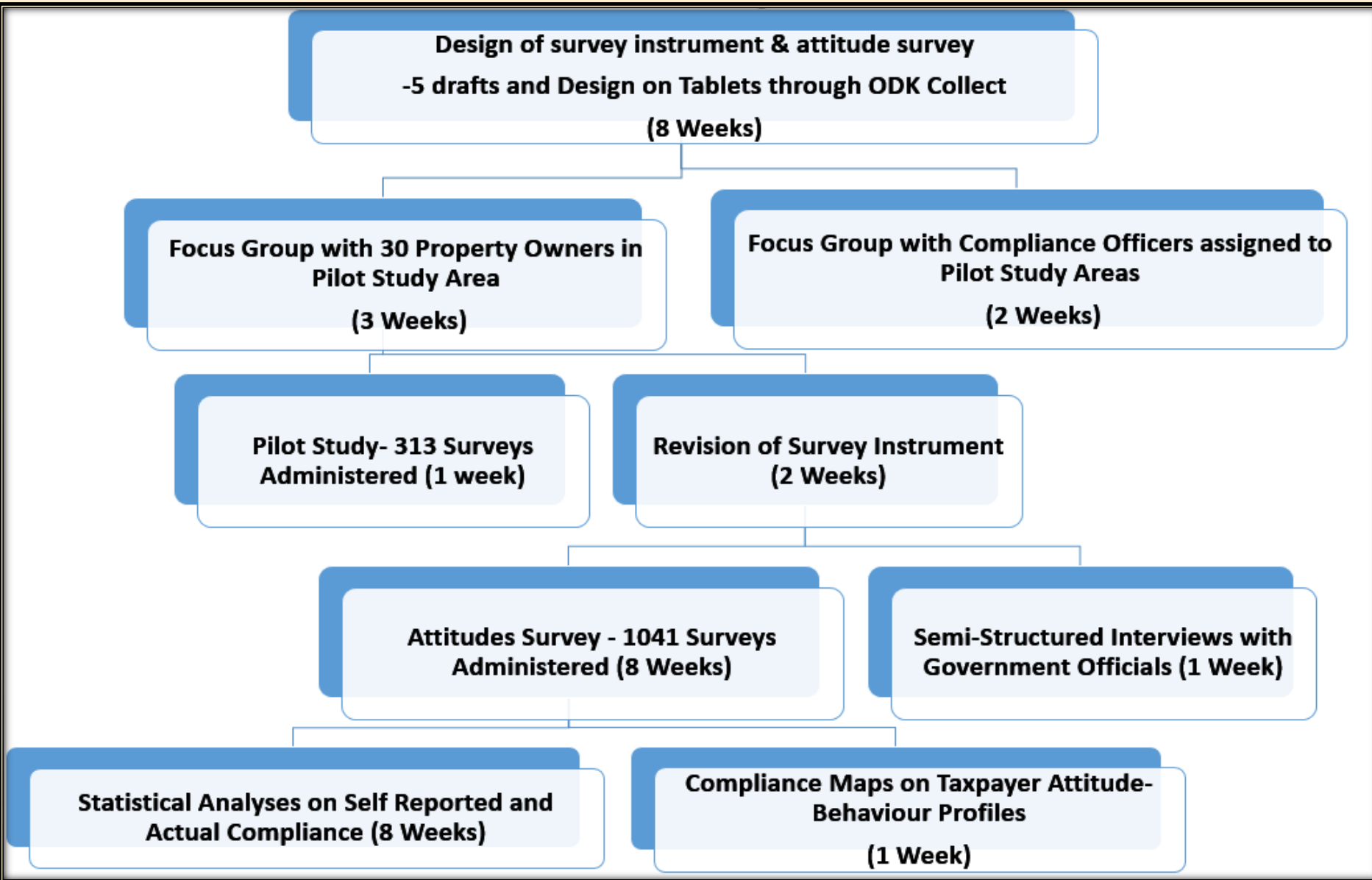
RESEARCH METHODOLOGY

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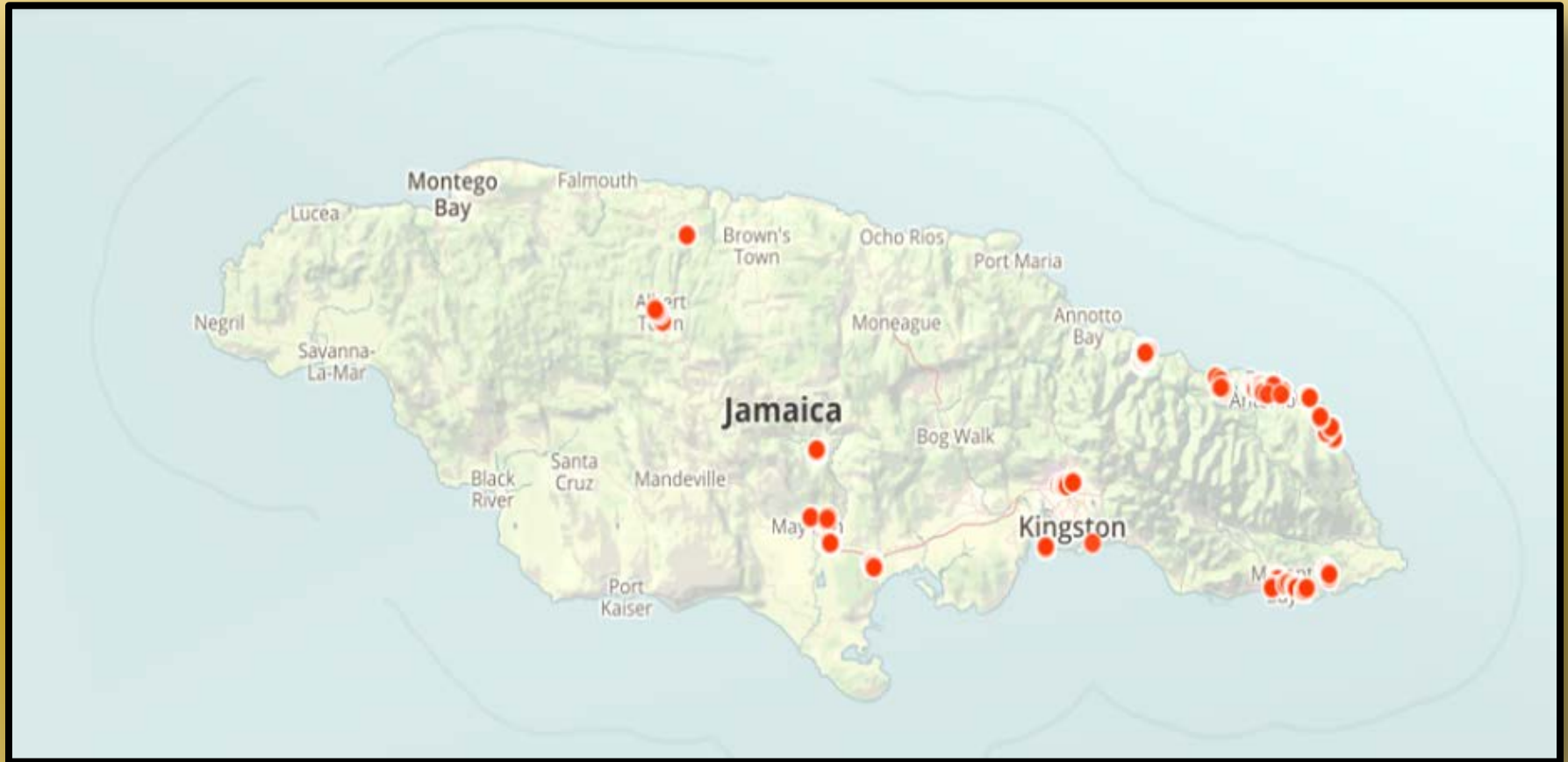
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METHODOLOGY: SAMPLE COHORT

Parishes	Selected Collectorates	Locations	Housing Units	No. of Respondents (Housing Units)
Kingston	Port Royal	Port Royal	160	12
St. Andrew	Constant Spring	Constant Spring Gardens	1259	100
St. Thomas	Morant Bay	Morant Bay	3086	230
St. Thomas	Port Morant	Port Morant	846	63
Portland	Port Antonio	Port Antonio	4654	347
Portland	Buff Bay	Buff Bay	1396	104
Clarendon	Chapelton	Chapelton	1340	100
Trelawny	Jackson Town	Jackson Town	675	50
TOTAL			13416	1006

METHODOLOGY: SURVEY LOCATIONS



METHODOLOGY: THE SURVEY

An attitudes survey was administered in 6/14 parishes to capture data on self-reported compliance. The instrument comprised of 6 sections:

1. **Property Characteristics**
2. **Attitudes to Property Taxes**
3. **Experimental Design** - Deterrence, Public Shame, Fairness/Use of Revenue
4. **Tax Motivation**
5. **Cultural and Social Attitudes**
6. **Demographic Data**



Treatment Questions

1. When was the last time you paid your property taxes? When was the last time you paid your property taxes?

last year 2 years ago 3 years ago 4 years ago 5 years ago 6 years ago 7 years ago other _____

2. How much did you pay in property taxes? _____

3. Please think about the other property owners in your neighbourhood. How likely is it that they will pay their next property tax bill? Please respond on a scale of 0 to 10.

0	1	2	3	4	5	6	7	8	9	10
They will definitely not pay					I am unsure if they will pay					They will certainly pay

4. Please tell me for the following statement whether you think it can always be justified, never be justified, or something in between: Cheating on taxes if you have the chance.

1	2	3	4	5	6	7	8	9	10
Can always be justified									Can never be justified

5. How likely is it that you will pay your next property tax bill? Please respond on a scale of 0 to 10.

0	1	2	3	4	5	6	7	8	9	10
I definitely will not pay					I am unsure if they will pay					I will certainly pay

METHODOLOGY: MATCHING TAX ATTITUDES & BEHAVIOR

Administering Surveys
to Respondents at their
homes

Collecting/storing GPS
coordinates in survey

Geodetic Conversions - GPS
to UTM

Using UTM coordinates to
obtain Valuation Roll
Numbers

Using Valuation Numbers
to obtain complain data
from TAJ's Tax Query Portal

Merging data from tax
portal with survey data.
Valuation numbers used as
primary key to link both
datasets in XLS

Uploading merged dataset
in ArcGIS 10

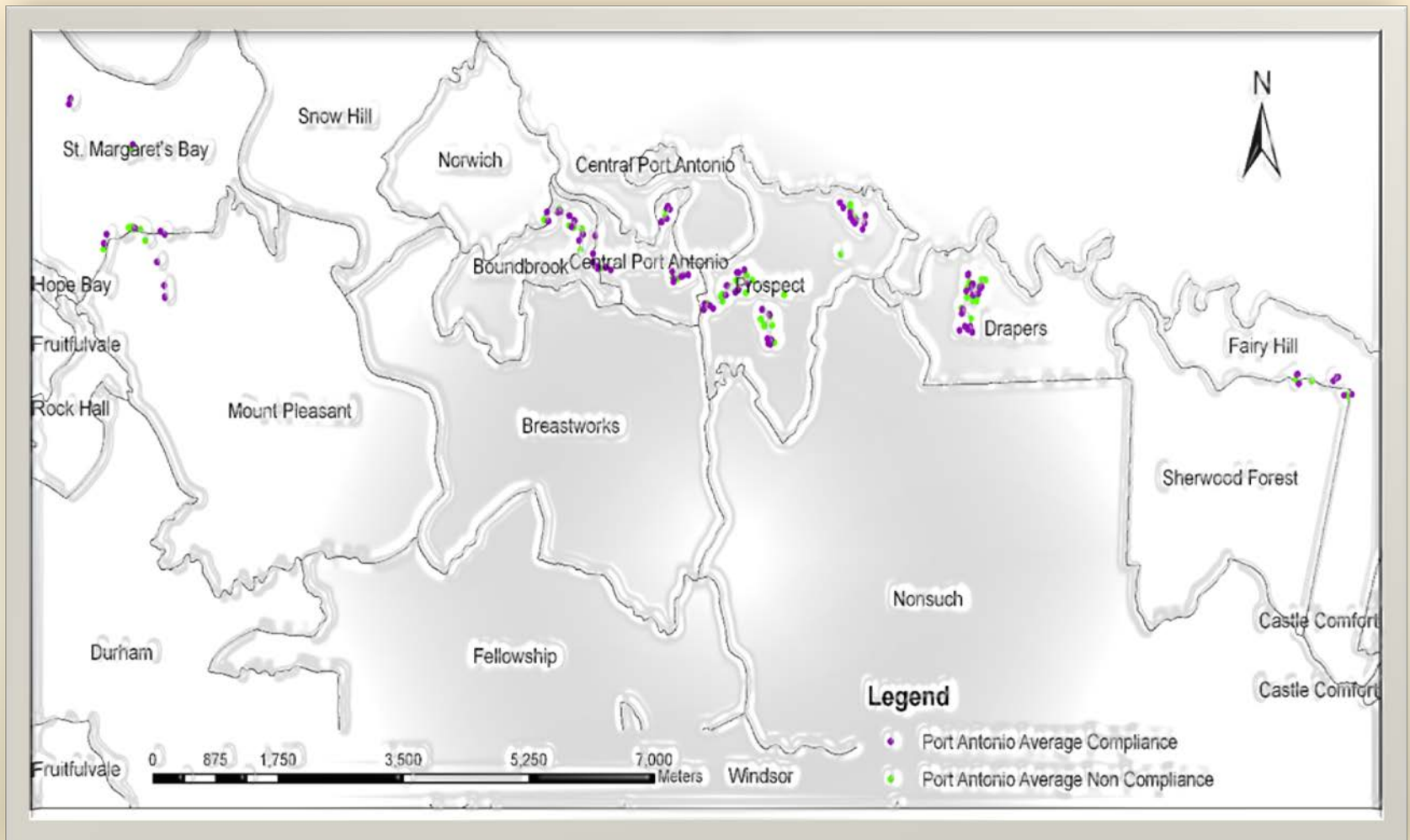
METHODOLOGY: THE MERGED DATASET

The dataset comprised of the following fields:

- **Respondent ID number**
- **UTM and GPS coordinates of each parcel**
- **Parcel Scheme Address**
- **Tax Collectorate to which each parcel is assigned**
- **Type of property owner – government, individual, church**
- **Tax liability, penalty, interest, total due, total paid and amount outstanding for each parcel for each tax year**
- **Annual Compliance rate for each parcel**
- **Compliance rate of each parcel for the study period**
- **Taxpayer attitudes on: A. likelihood of payment by neighbors, B. likelihood of paying their next tax bill & C. cheating on taxes**



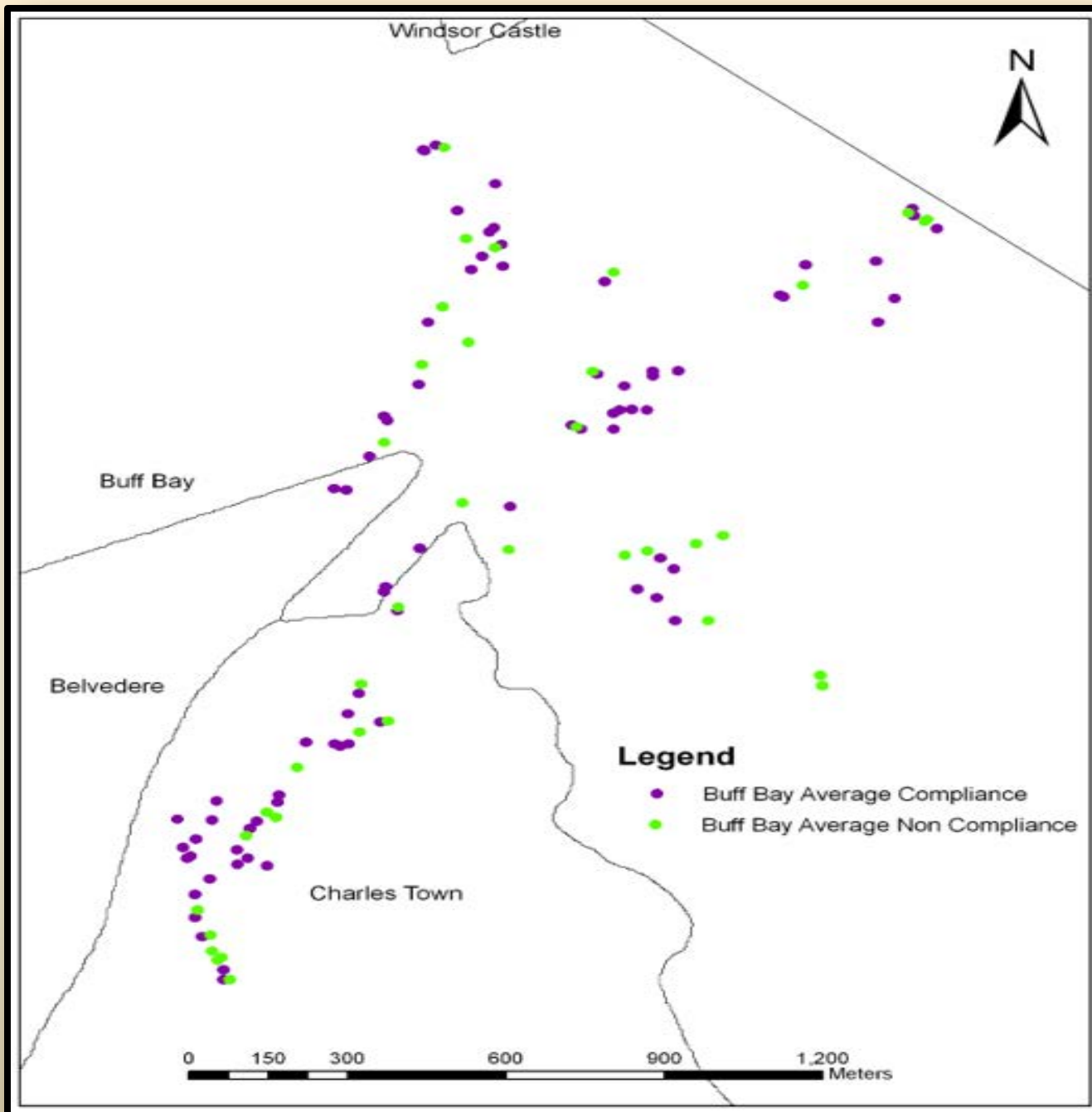
USING GIS TO ANALYSE COMPLIANCE

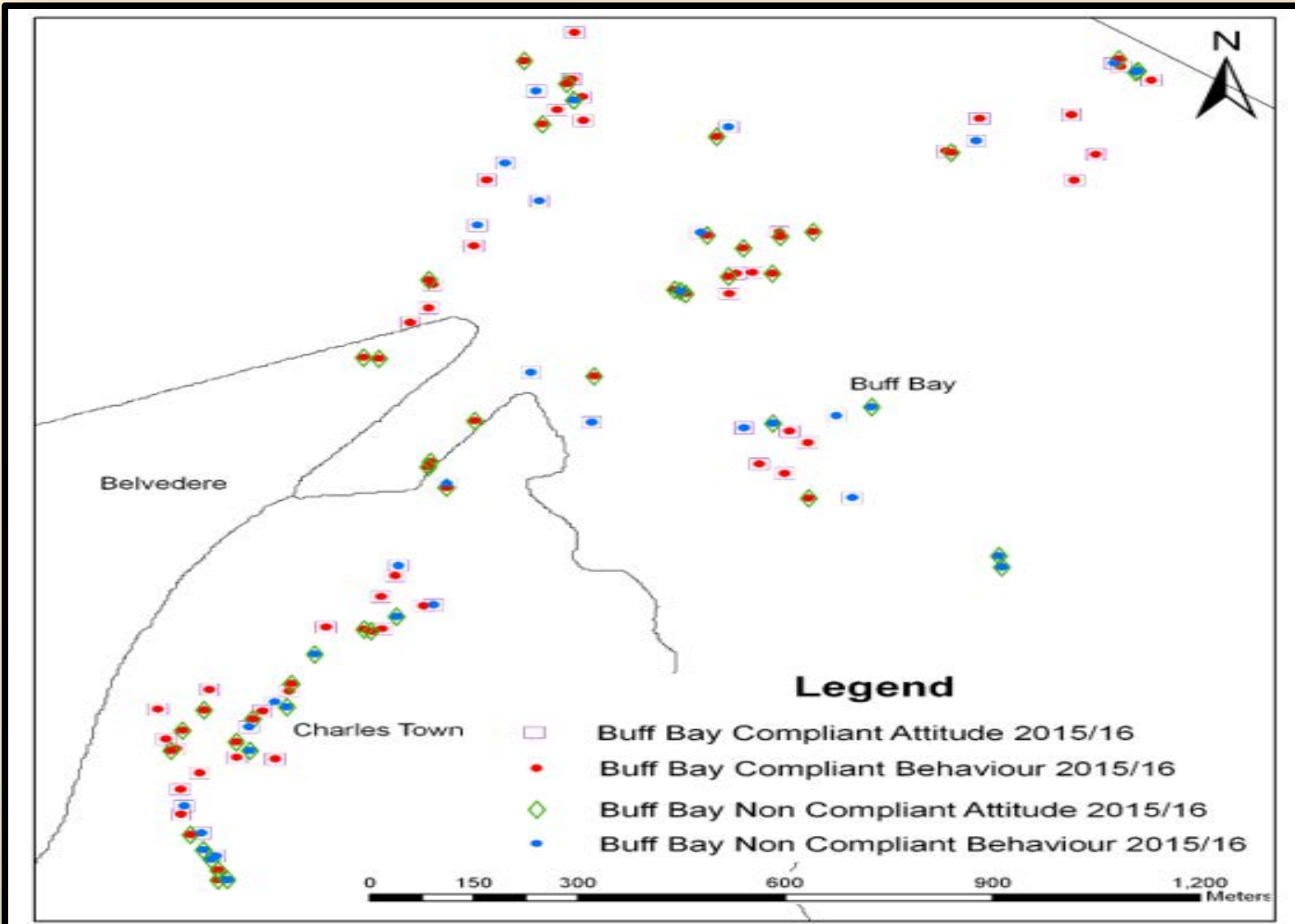


LIMITATIONS & ETHICAL CONSIDERATIONS

- **Absence of standardized boundaries across organisations on communities.**
- **Survey respondents were not advised that their responses would be matched to their tax behaviour. In response, taxpayers rarely, if ever make decisions with perfect knowledge.**
- **Spatial analysis can further compromise anonymity as highlighted by Sherman and Fetters (2007). The research team used point data as against grid data, to add further to the anonymity of respondents through maps that show taxpayer behaviour and attitudes.**

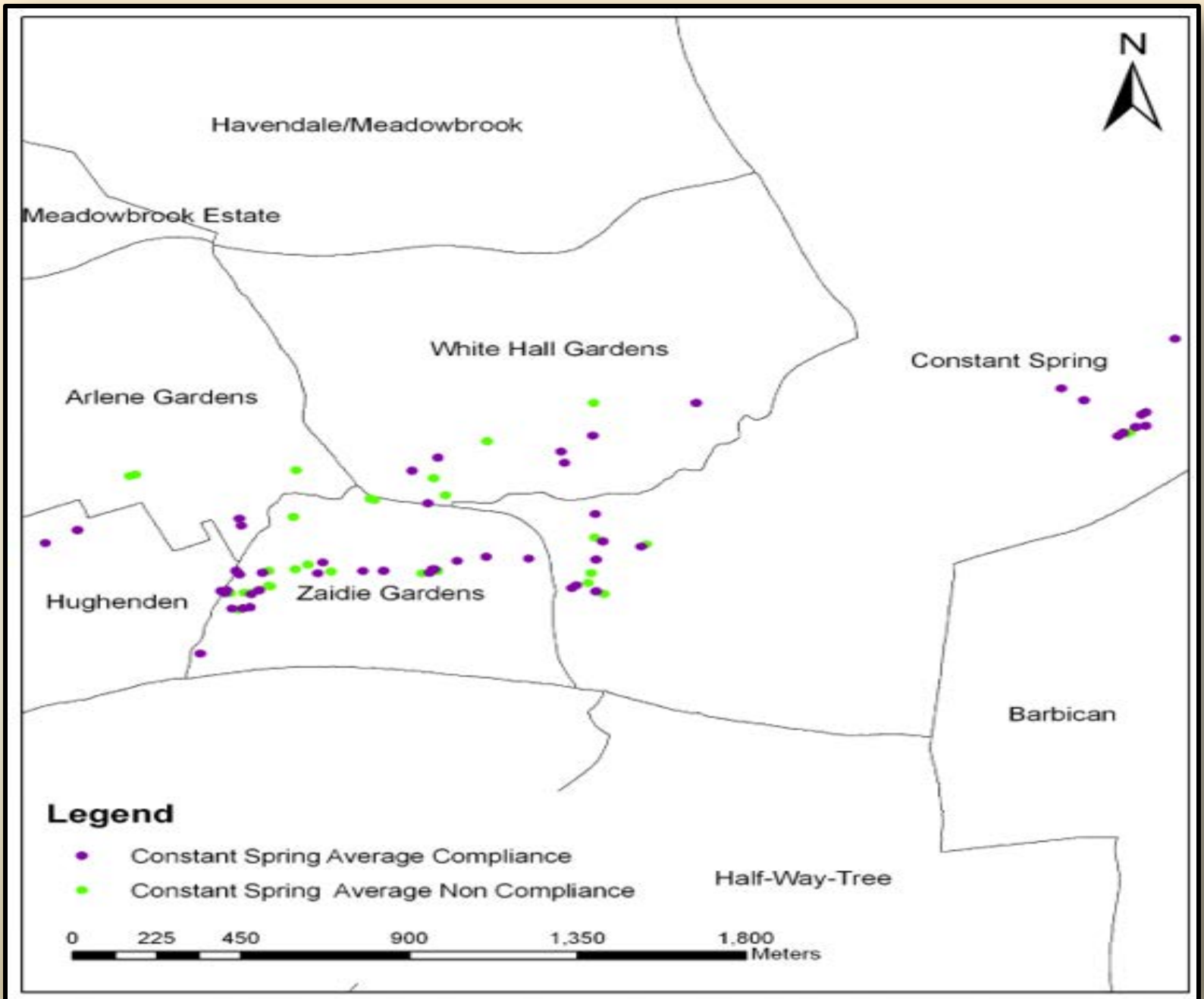


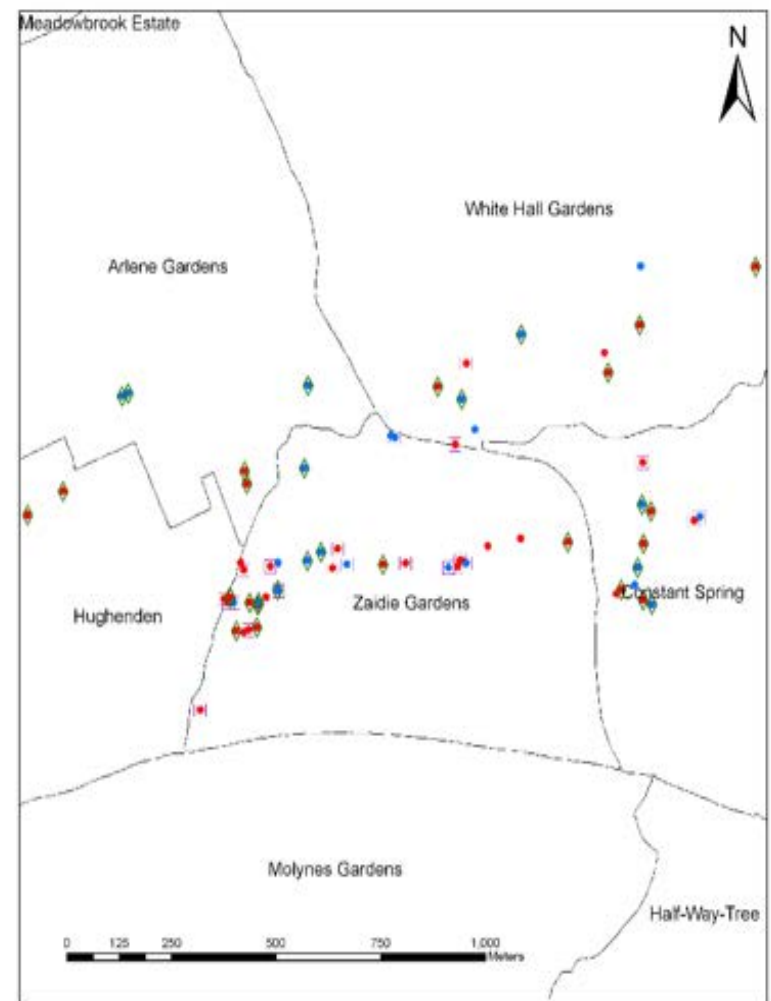
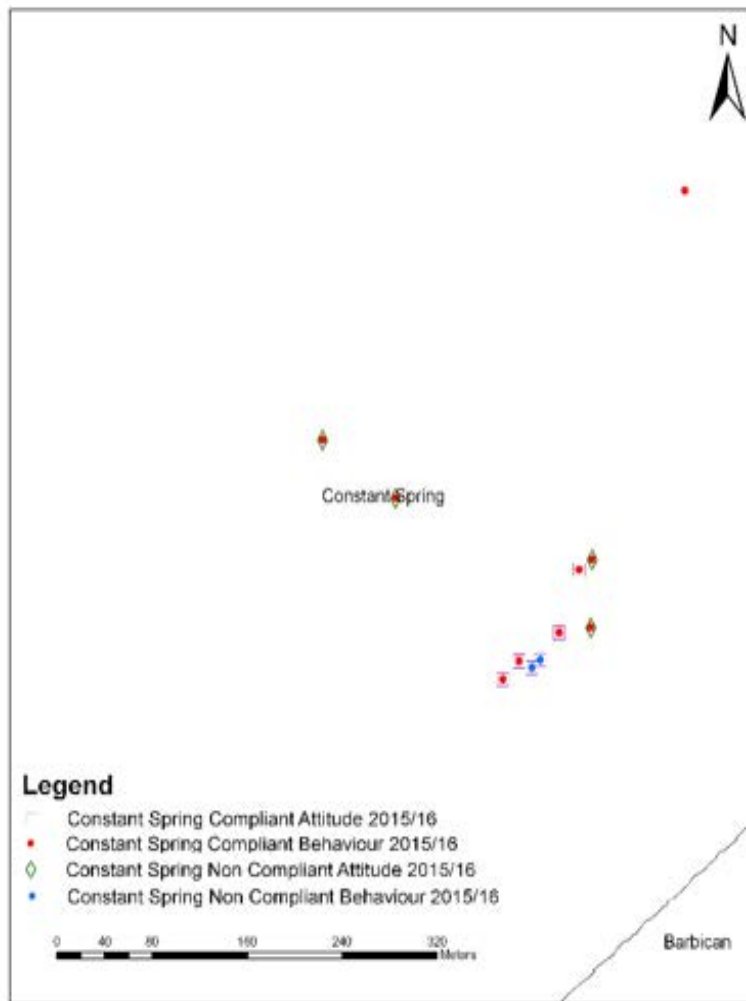




NOTES		
	Compliant attitude matches compliant behaviour	38.60%
	Non-compliant attitude matches a compliant behaviour	29.57%
	Compliant attitude matches non-compliant behaviour	19.13%
	Non-compliant attitude matches non-compliant behaviour	13.04%







NOTES		
	Compliant attitude matches compliant behaviour	35.90%
	Non-compliant attitude matches a compliant behaviour	29.49%
	Compliant attitude matches non-compliant behaviour	17.95%
	Non-compliant attitude matches non-compliant behaviour	16.67%

TAX ATTITUDE-BEHAVIOUR PROFILES OF COLLECTORATES

Collectorates	Percentage of cohort who are voluntarily compliant ¹	Percentage of cohort who need enforcement ²	Percentage of cohort with only a willingness to pay ³	Percentage of cohort with a compliant attitude ⁴
Port Antonio	37.57%	39.99%	22.22%	57.79%
Buff Bay	38.60%	42.61%	19.13%	57.73%
Morant Bay	37.39%	44.35%	18.26%	55.65%
Port Morant	53.13%	27.09%	19.79%	72.92%
May Pen	27.69%	44.61%	27.69%	55.38%
Chapelton	38.71%	22.58%	38.71%	77.42%
Jackson Town	27.66%	46.81%	25.53%	53.19%
Constant Spring	35.90%	46.14%	17.95%	53.85%
Port Royal	42.86%	35.71%	21.43%	64.29%

DISAGGREGATION OF TAXPAYERS NEEDING ENFORCEMENT

Collectorate	Non-compliant attitude with compliant behaviour	Non-compliant attitude with non-compliant behaviour
Port Antonio	55.56%	44.44%
Buff Bay	69.39%	30.60%
Morant Bay	66.67%	33.33%
Port Morant	61.53%	38.46%
May Pen	41.38%	58.62%
Chapelton	42.87%	57.13%
Jackson Town	18.18%	81.82%
Constant Spring	63.89%	36.11%
Port Royal	80.00%	20.00%

CONCLUDING REMARKS & RECOMMENDATIONS - 1

- **With the aid of spatial analysis, 4 different types of tax attitude-behaviour profiles were identified and analysed.**
- **The amalgamation of data from the NLA and the TAJ property tax online query portal, highlighted the importance of a shared spatial data infrastructure, which can be used to analyse different types of tax behaviour and the behaviour of taxpayers for different types of taxes.**
- **The study suggests GIS technology can be used to capture built environment issues that are implicit; and are not easily or readily identified or easily observed through statistical analysis.**



CONCLUDING REMARKS & RECOMMENDATIONS - 2

- **The study suggests there are latent variables that affects compliance in Jamaica. Qualitative/exploratory studies are needed to unearth those variables, with a view to developing strategies that will increase compliance rates.**
- **A unified spatial data infrastructure will also assist the government with identifying all taxpayers, which is pivotal to reducing tax evasion rates in Jamaica.**



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