
SAVE
NEW YORK CITY
TREES
Tree Census ! 2015

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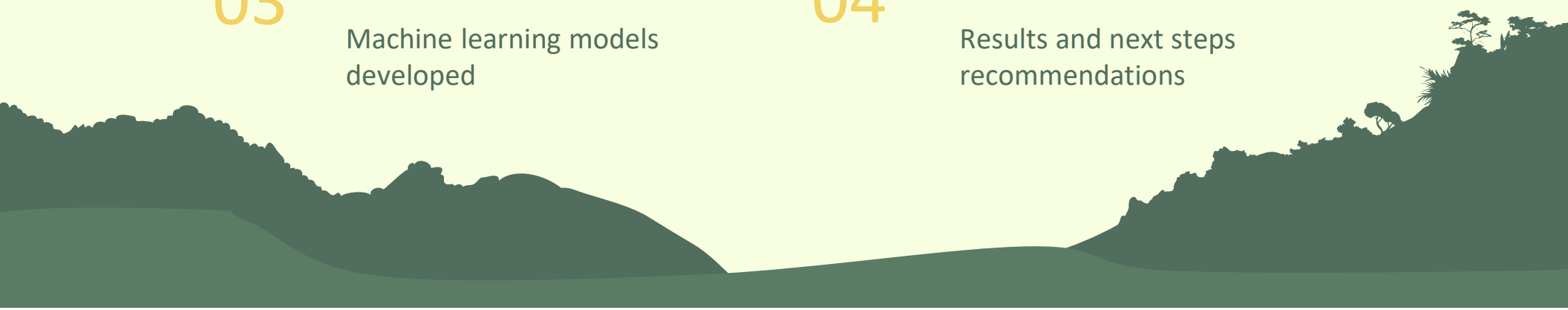
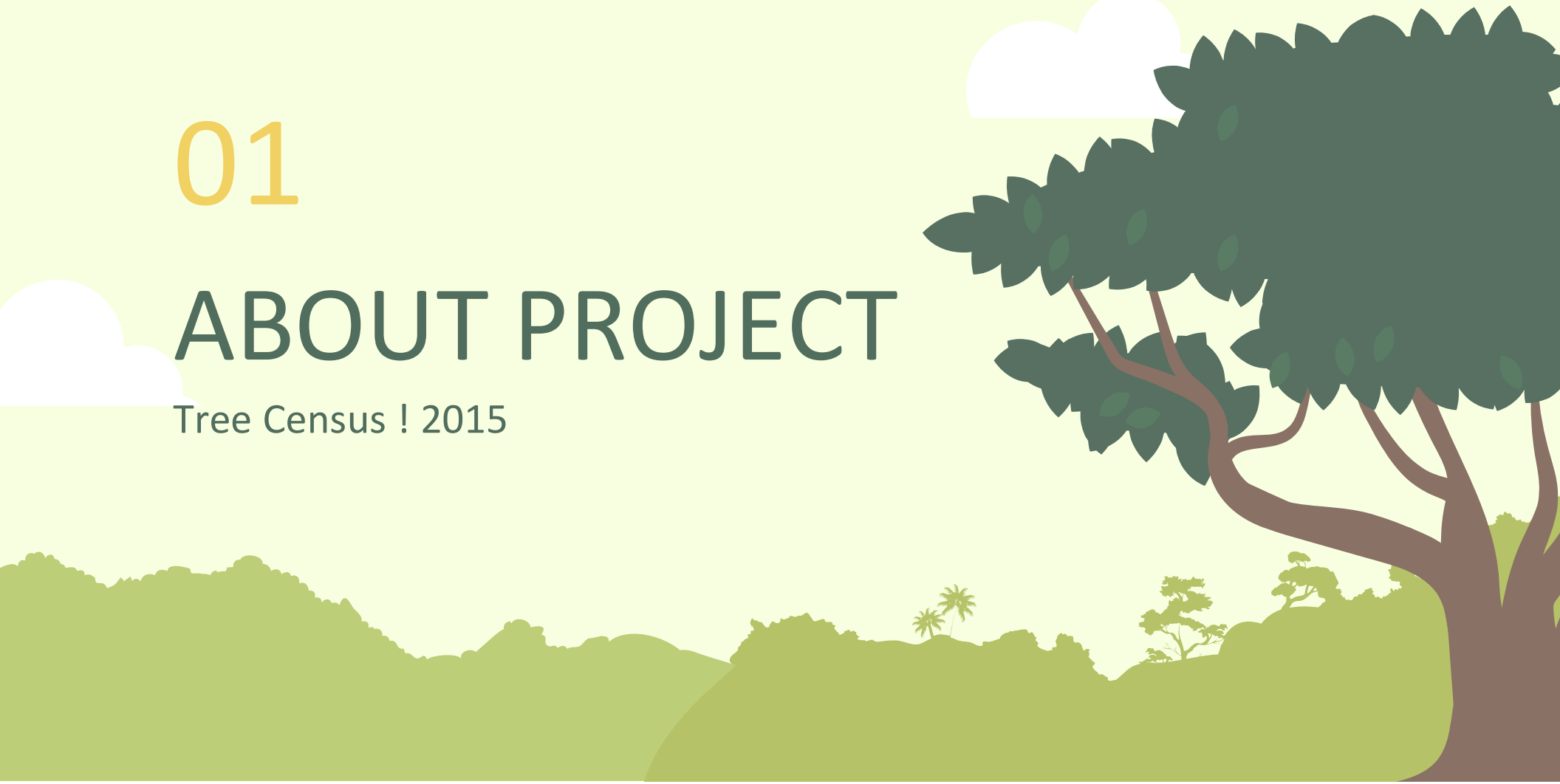


01

ABOUT PROJECT

Tree Census ! 2015



INTRODUCTION

The aim of this project is to support New York City Parks Deparment efforts of Urban Forest to reduce climate and air pollution by predicting the health of the trees. The early detection will provide an opprotunity to mitigate any conditions that are causing poor health in a tree.


“Each year NYC's street trees reduce summer electricity use from shading by 50,000 MWh.”
Every tree matters !

Problem Statement : Predict the health status of trees in New York City

Good Fair Poor

02

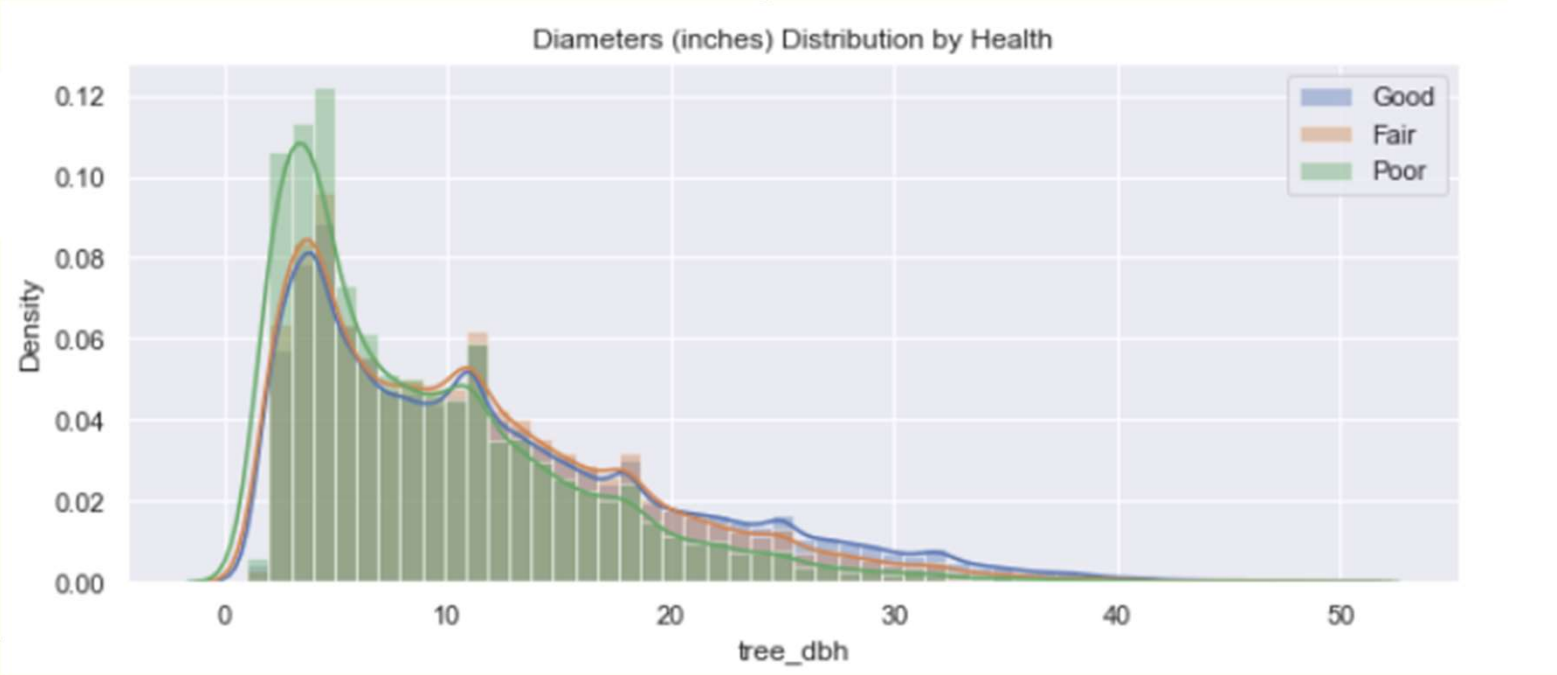
EDA

Exploratory Data Analysis

EDA

- One City | Five Boroughs | 666,134 Trees
- 81% of trees are in good health
- Most common species – London Planetree
- Chinese Chestnut, Atlas Cedar and Red Pine have least poor health trees.

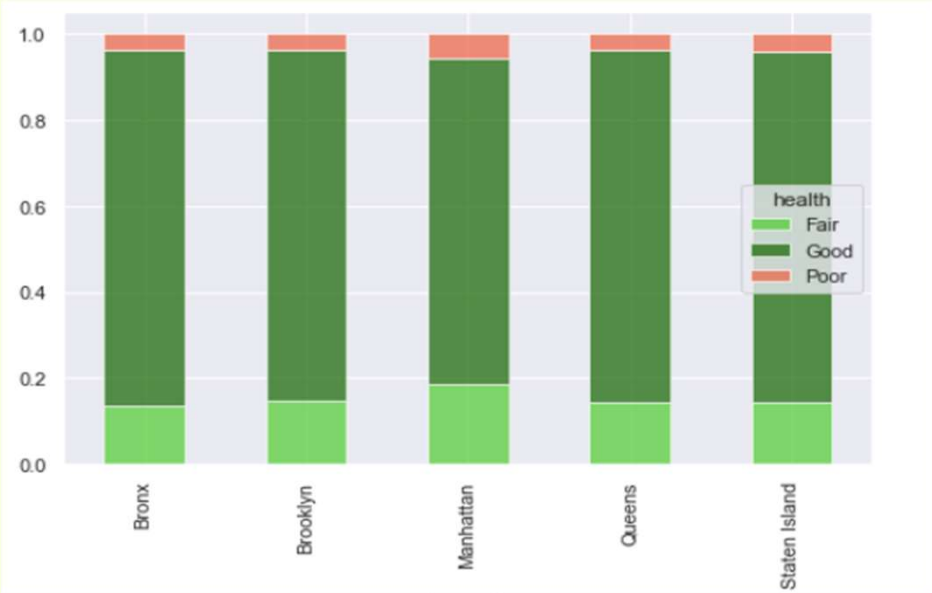
Most trees are less than 50 inches in diameter



EDA

- Most of the trees are planted on the curb
- Most common problem in the tree is related to stones
- Manhattan has highest number of trees in poor health

Tree Health by Borough



Problems in tree

01

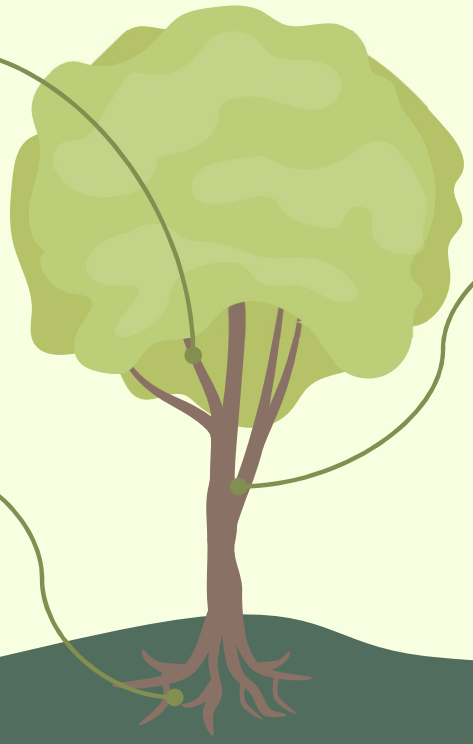
BRANCH

Problems caused by lights, wire, shoes, or other brnaches problems

02

TRUNK

Problems casued by wire, rope,lights, or other trunk problems



03

ROOT

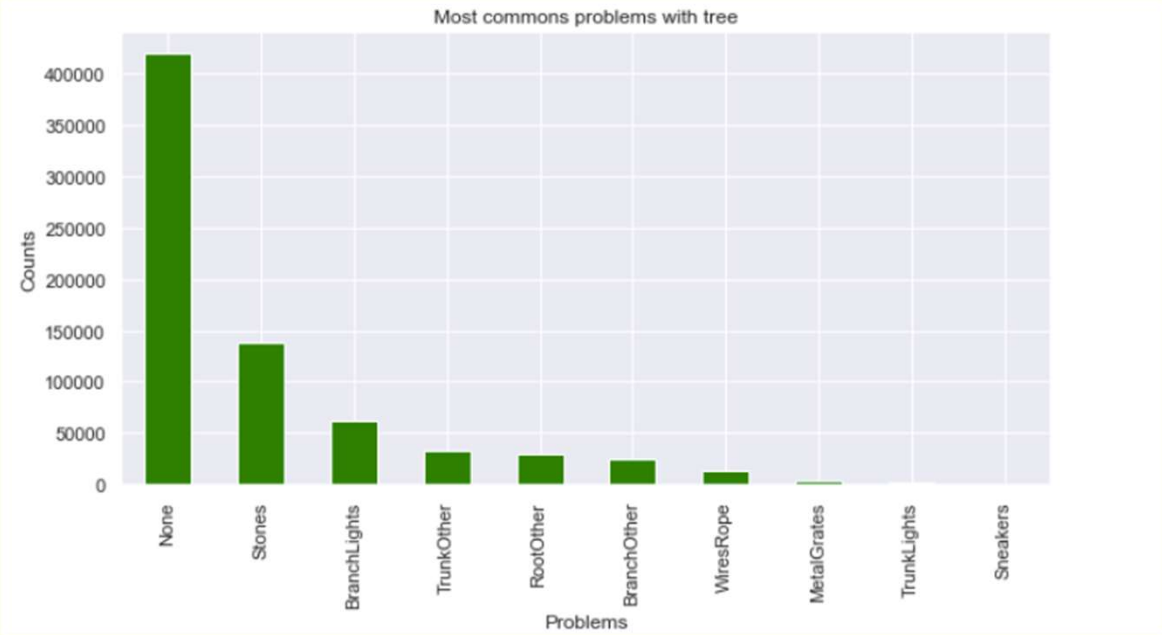
Problems casused by paving stones, metal grates,other root problems

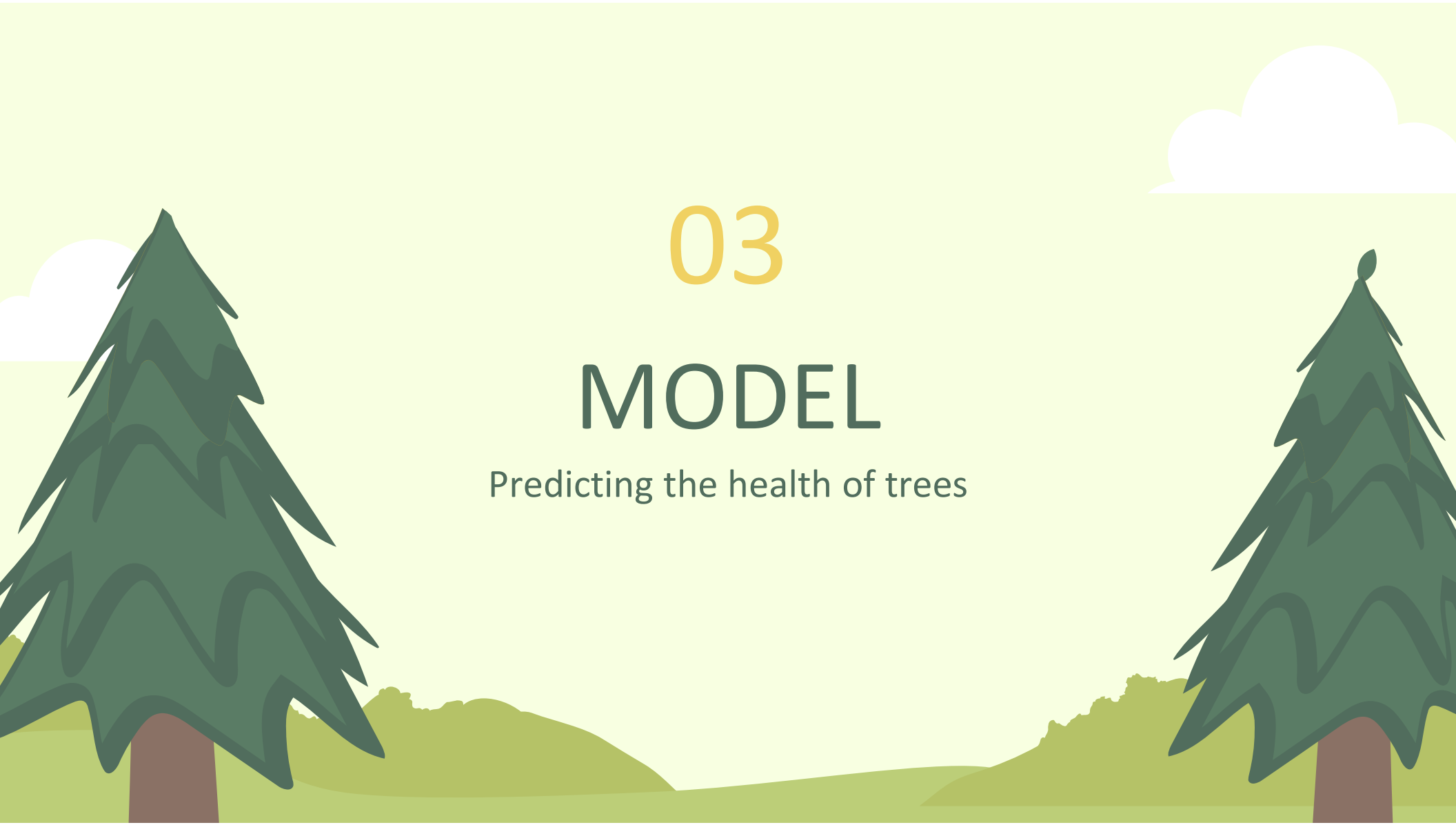
04

OTHERS

Gurads around trees, sidewalk damage adjacent to tree

Most common problems in trees





03

MODEL

Predicting the health of trees

Intial Models – Comparsions

Models	Logistic Regression		K-Nearest Neighbor		Decision Tree		Random Forest		Gradient Boosting	
	Train Accuracy - 0.81		Train Accuracy - 0.85		Train Accuracy - 0.99		Train Accuracy - 0.99		Train Accuracy – 0.81	
	Test Accuracy - 0.81		Test Accuracy - 0.80		Test Accuracy - 0.74		Test Accuracy - 0.81		Test Accuracy – 0.81	
	Recall	Precision	Recall	Precision	Recall	Precision	Recall	Precision	Recall	Precision
Good	1.00	0.00	0.94	0.85	0.85	0.86	0.96	0.85	1.00	0.81
Fair	0.00	0.00	0.25	0.40	0.31	0.30	0.20	0.47	0.01	0.51
Poor	0.00	0.00	0.06	0.38	0.18	0.17	0.12	0.39	0.03	0.48

Dealing with data imbalance

Random Forest Models	Random Oversampling		SMOTE		Borderline SMOTE		AdaSYN	
	Train Accuracy - 0.81		Train Accuracy - 0.99		Train Accuracy - 0.99		Train Accuracy - 0.99	
	Test Accuracy - 0.81		Test Accuracy - 0.87		Test Accuracy - 0.89		Test Accuracy - 0.86	
	Recall	Precision	Recall	Precision	Recall	Precision	Recall	Precision
Good	0.99	0.89	0.93	0.85	0.93	0.86	0.93	0.85
Fair	0.91	0.99	0.79	0.87	0.83	0.90	0.77	0.87
Poor	1.00	0.98	0.91	0.90	0.93	0.94	0.91	0.89

Random Forest Model

Post Random Sampling and Grid SearchCV

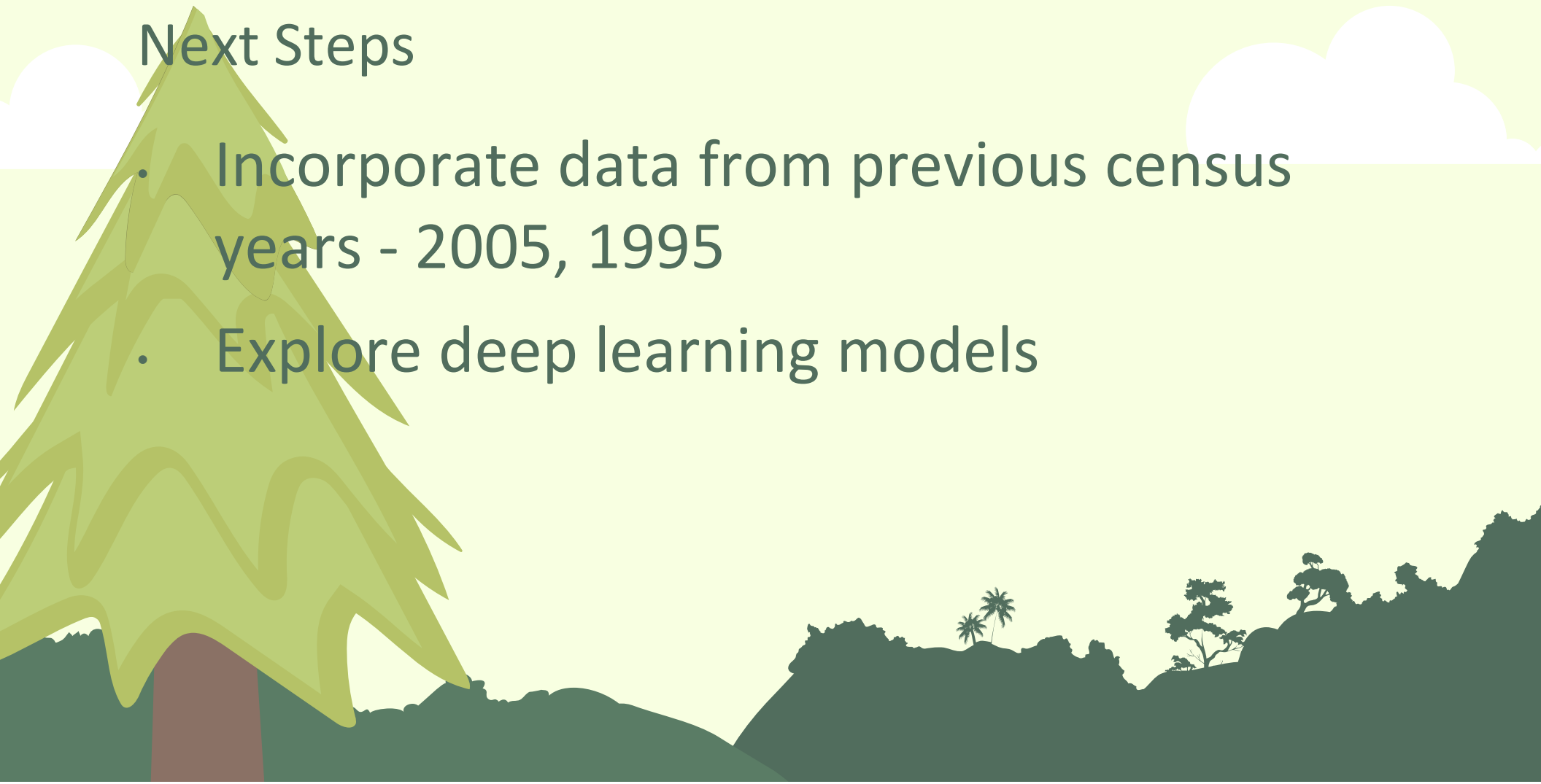
Random Forest		
Train Accuracy -		
Test Accuracy -		
	Recall	Precision
Good		
Fair		
Poor		

04

Next Steps

Next Steps

- Incorporate data from previous census years - 2005, 1995
- Explore deep learning models



THANKS!

Do you have any questions?

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