

EPA PARCELS PROJECT

Cadastral Data Exchange and RESTful APIs

Funded by US EPA Grant 83431001

Prepared for EN2014

February 20, 2014

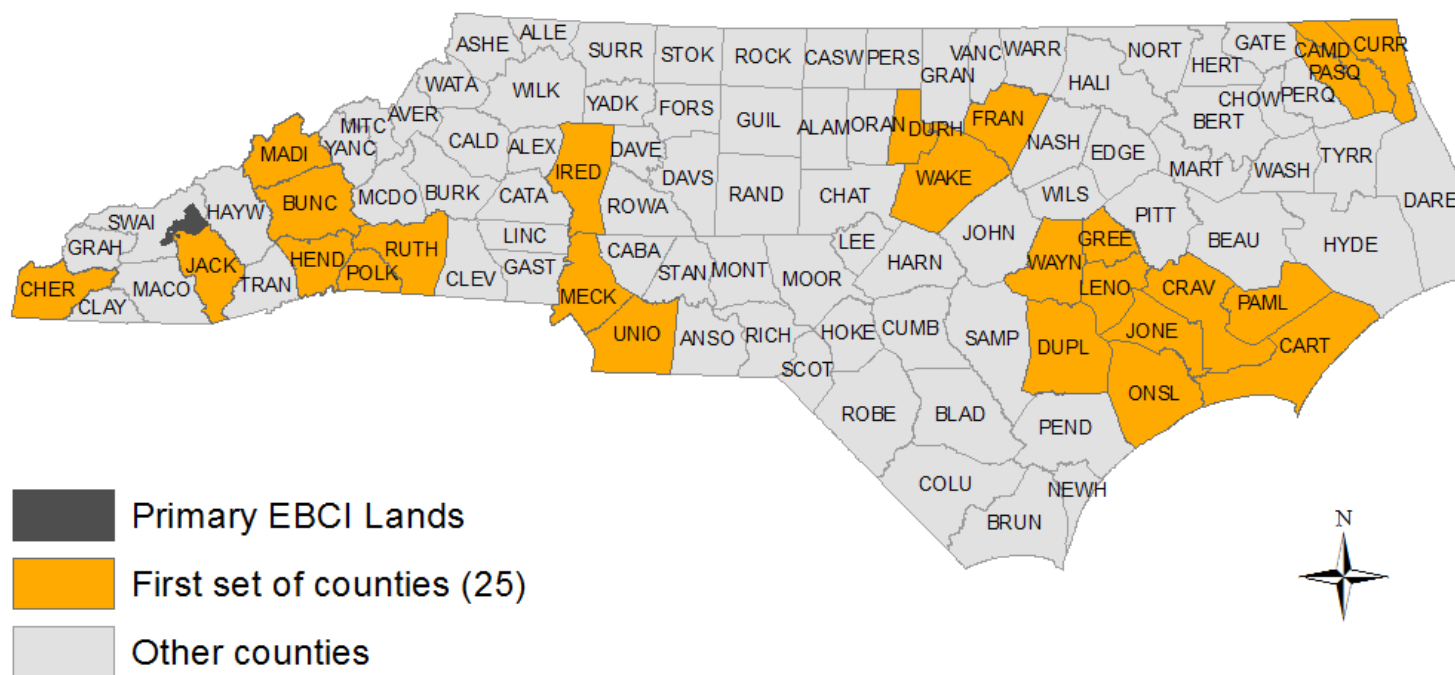
Today's Topics

- Collaboration in North Carolina
- Parcels Business Case
- EPA Exchange Network Grant / Team
- Geospatial Data Exchange
- RESTful Geo APIs
- Benefits to Exchange Network
- Q&A

Collaboration and Parcels Business Case...

County, State and Tribal Partners

North Carolina and Eastern Band of Cherokee Indians Integrated Cadastral Data Exchange Project Participants

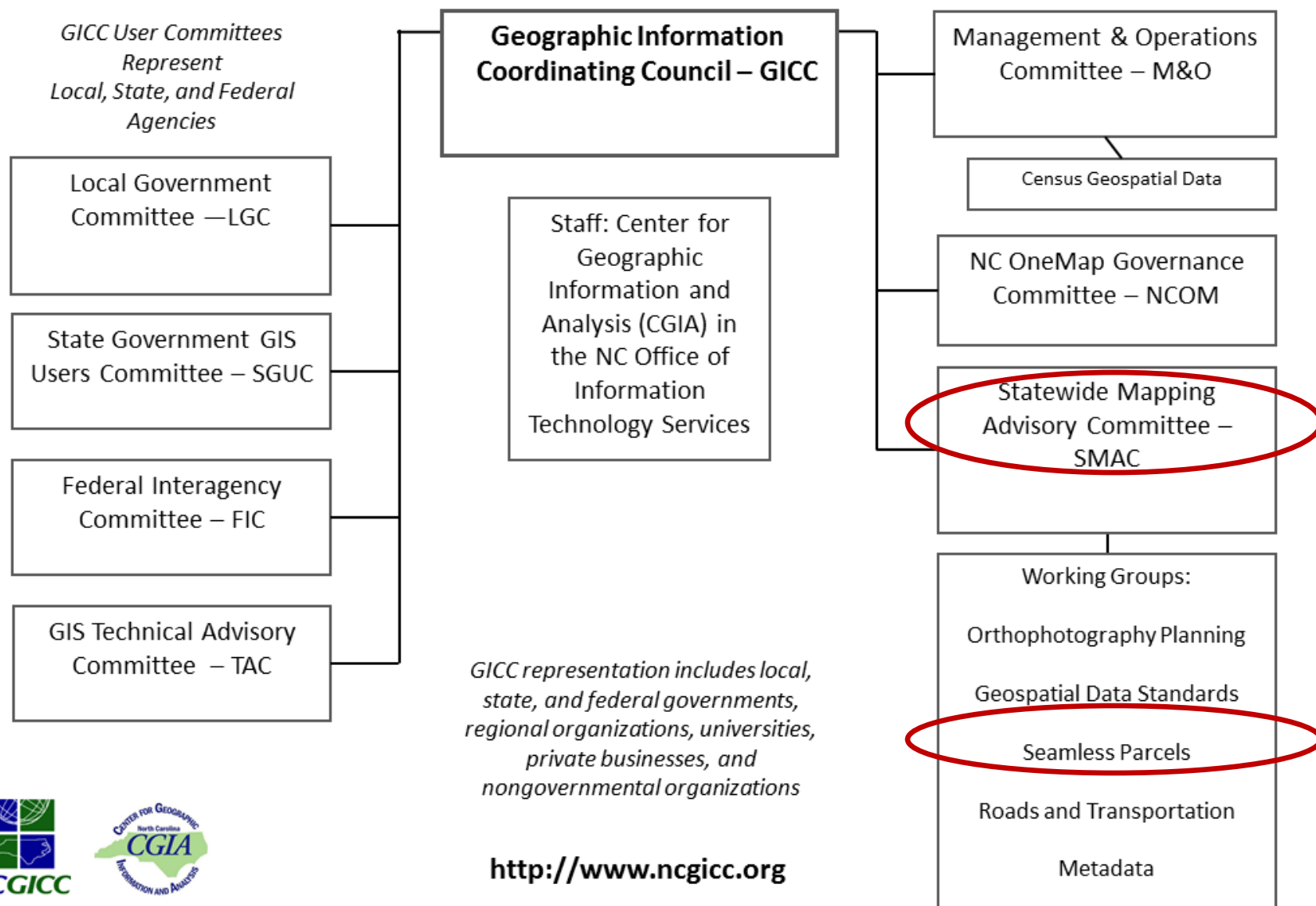


Sources: NC Center for Geographic Information and Analysis
and the Working Group for Seamless Parcels,
Statewide Mapping Advisory Committee.

January 2014



Collaboration Through the NC Geographic Information Coordinating Council



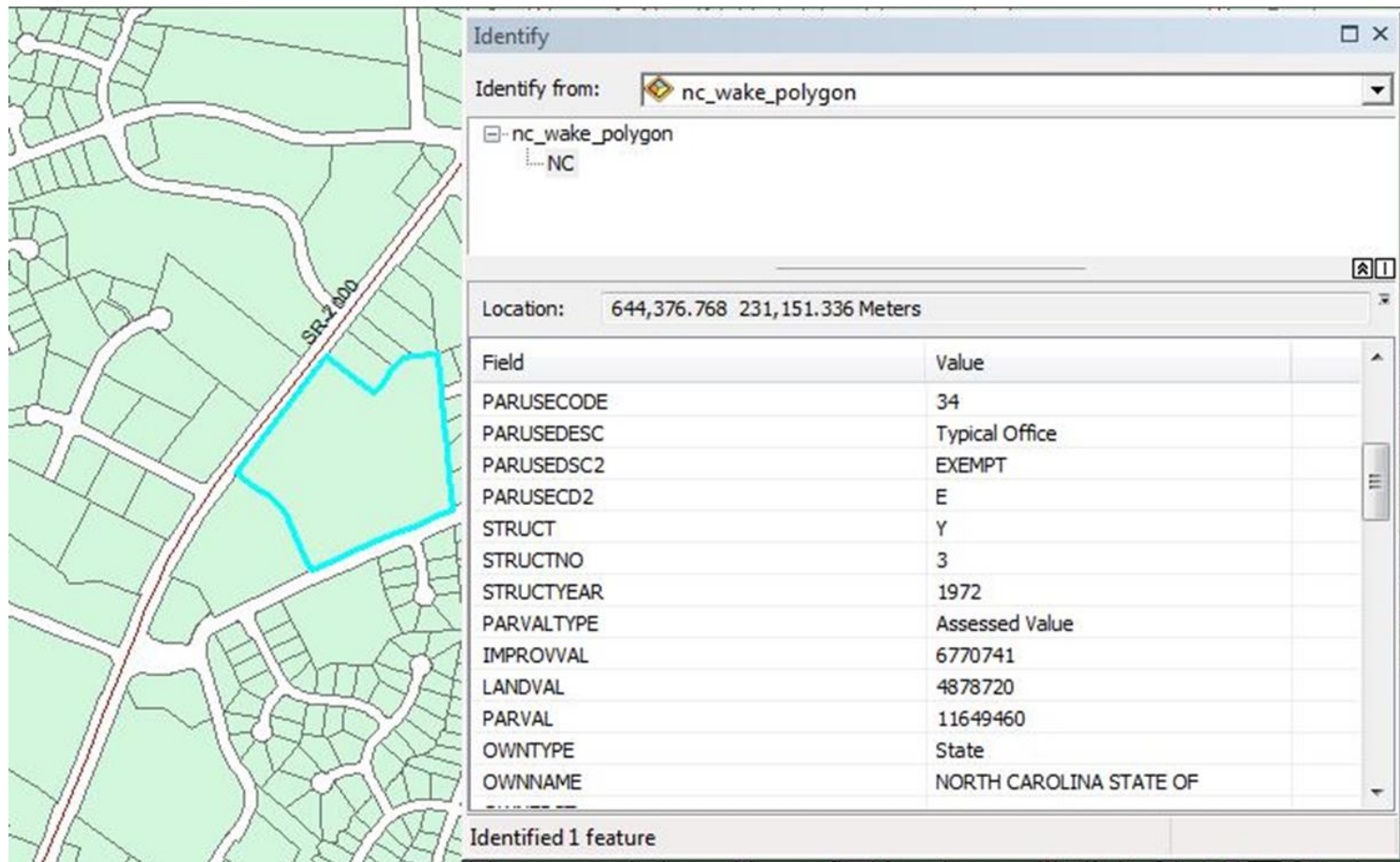
<http://www.ncgicc.org>

Parcels...



Parcels...

Cadastral Data: represent property boundaries and associated descriptors of the land.



Benefits in NC

- Standard data fields – consistent for multi-county areas
- One source for web services with statewide parcels
- Data consumers
 - Business uses range from environmental assessment, emergency response, to many other government and commercial functions
- Data producers
 - Much easier to create applications that solve problems
 - New customers and eyes on data, ‘opens’ data
 - Metadata is a product
 - Data retention (disaster recovery / archiving)

Adding geospatial REST interfaces to Exchange Network services helps broaden reach to much wider audience, simplifies discovery and use of geospatial data

EPA Exchange Network Grant...

Grant Project and Team

- EPA Exchange Network Grant 2009
 - Some delays
 - Project revived 2012
 - Vendor selected 2013
 - Completing April 2014
- Working Group for Seamless Parcels
 - Eastern Band of Cherokee Indians
 - Land Records Management Program
 - NC Department of Transportation
 - NC CGIA / ITS
 - NC Emergency Management
 - NC Department of Revenue
 - NC Environment and Natural Resources
 - GICC Chair

Team Work

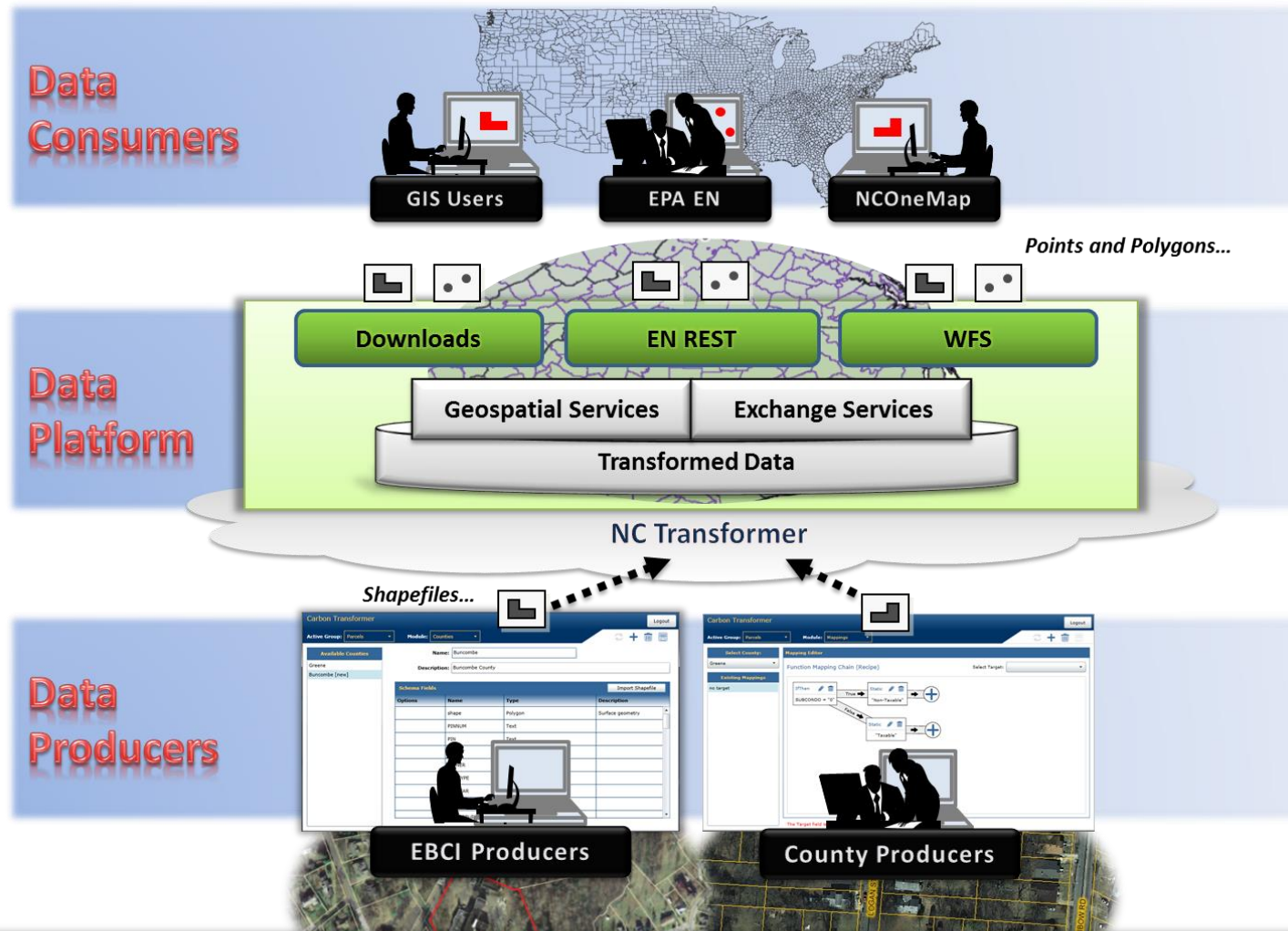
Players

- **Carbon Project, Inc.**
- **Fairview Industries, Inc.**
- **Atlas Geographic Data, Inc.**
- **CGIA /ITS**
- **Dept. of Secretary of State**
- **Department of Transportation**
- **Other state agencies**
- **Tribal and local partners**

Expertise

- **Application development**
- **Parcel data / standards**
- **Parcel data analysis / management**
- **Project management / partners**
- **Parcel data / standards**
- **Parcel integration**
- **Parcel data applications**
- **Data development and management**

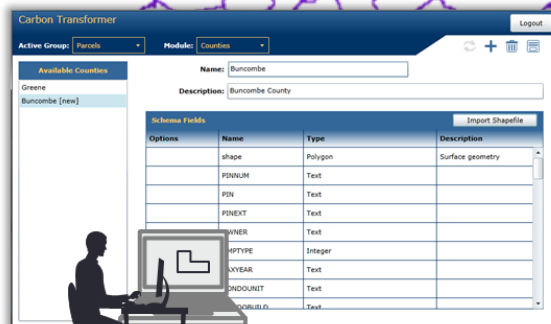
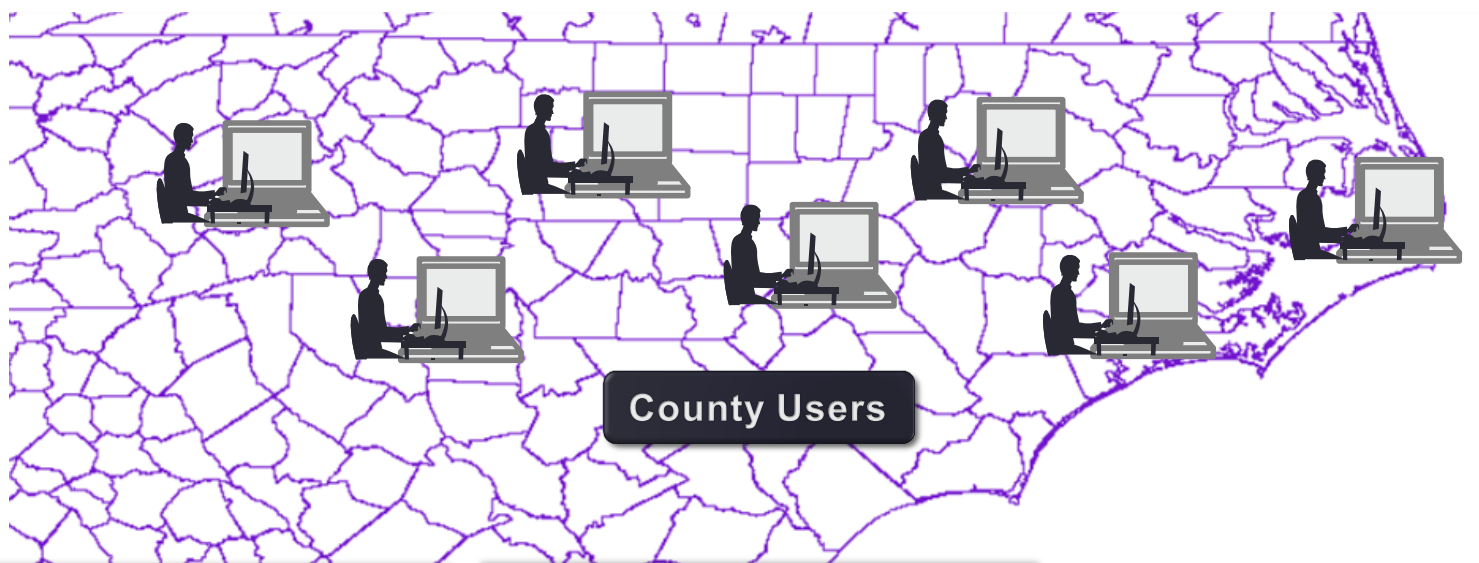
What's Being Developed?



Online capability for counties/EBCI to upload data, translate to standard, create 'points', feed NC OneMap and EPA Exchange Network...

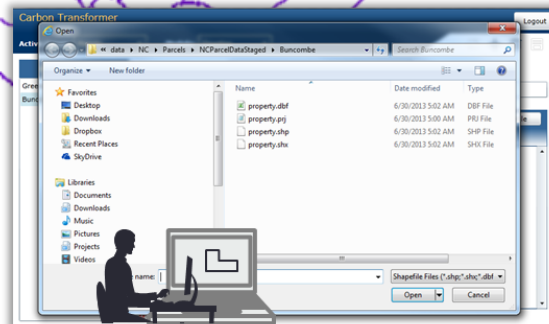
Local Govt Engagement

- County parcel data experts now being engaged, data being transformed and deployed on cloud...



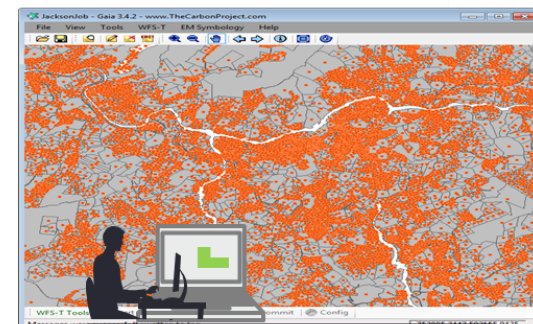
1

Select Schema



2

Upload Shapefile

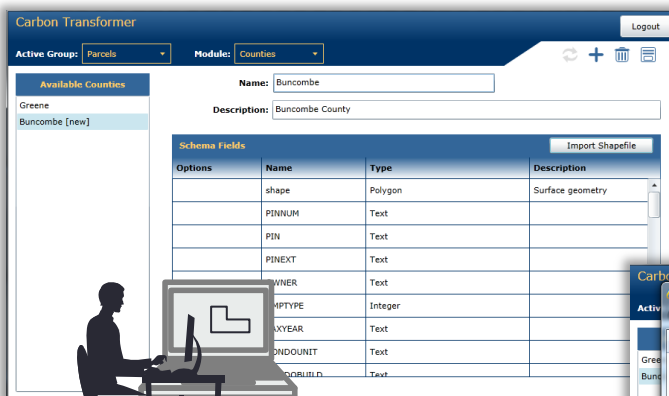


3

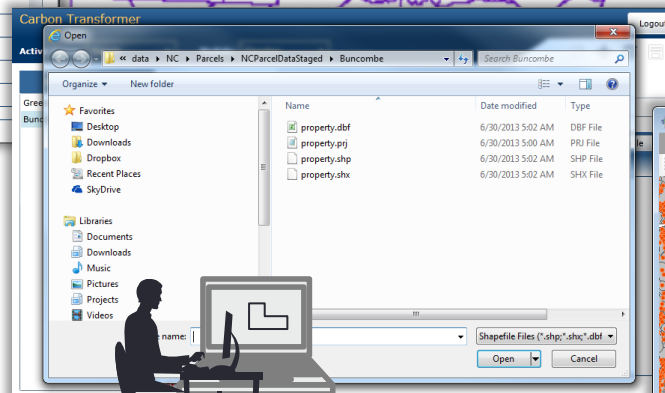
Transform Data

Geospatial Data Exchange and the Transformer...

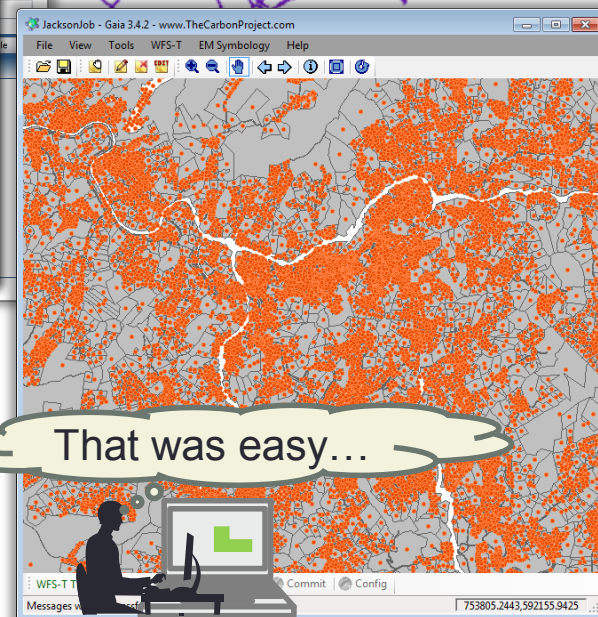
Local Data Providers...



1

Select Schema

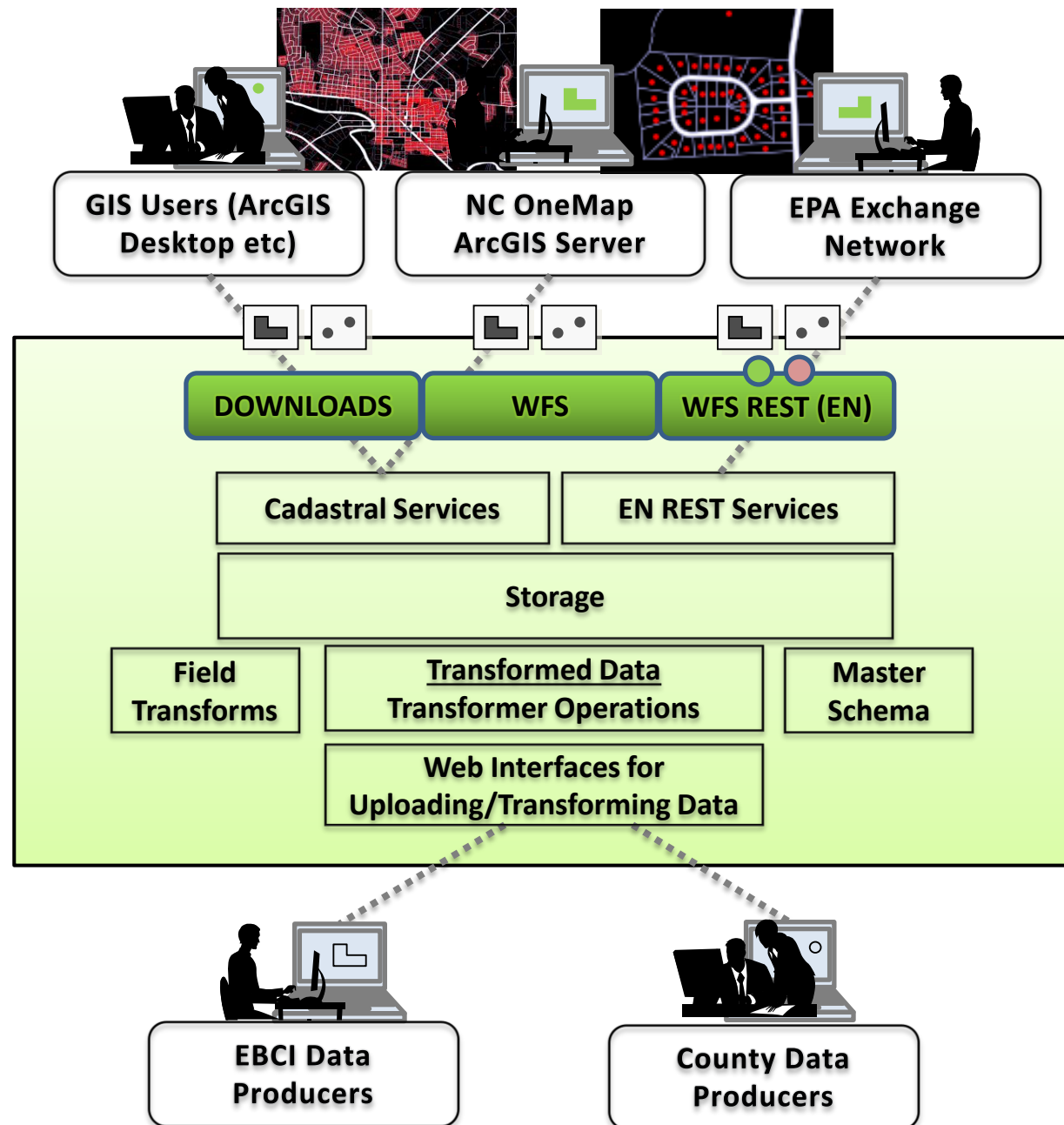
2

Upload Shapefile

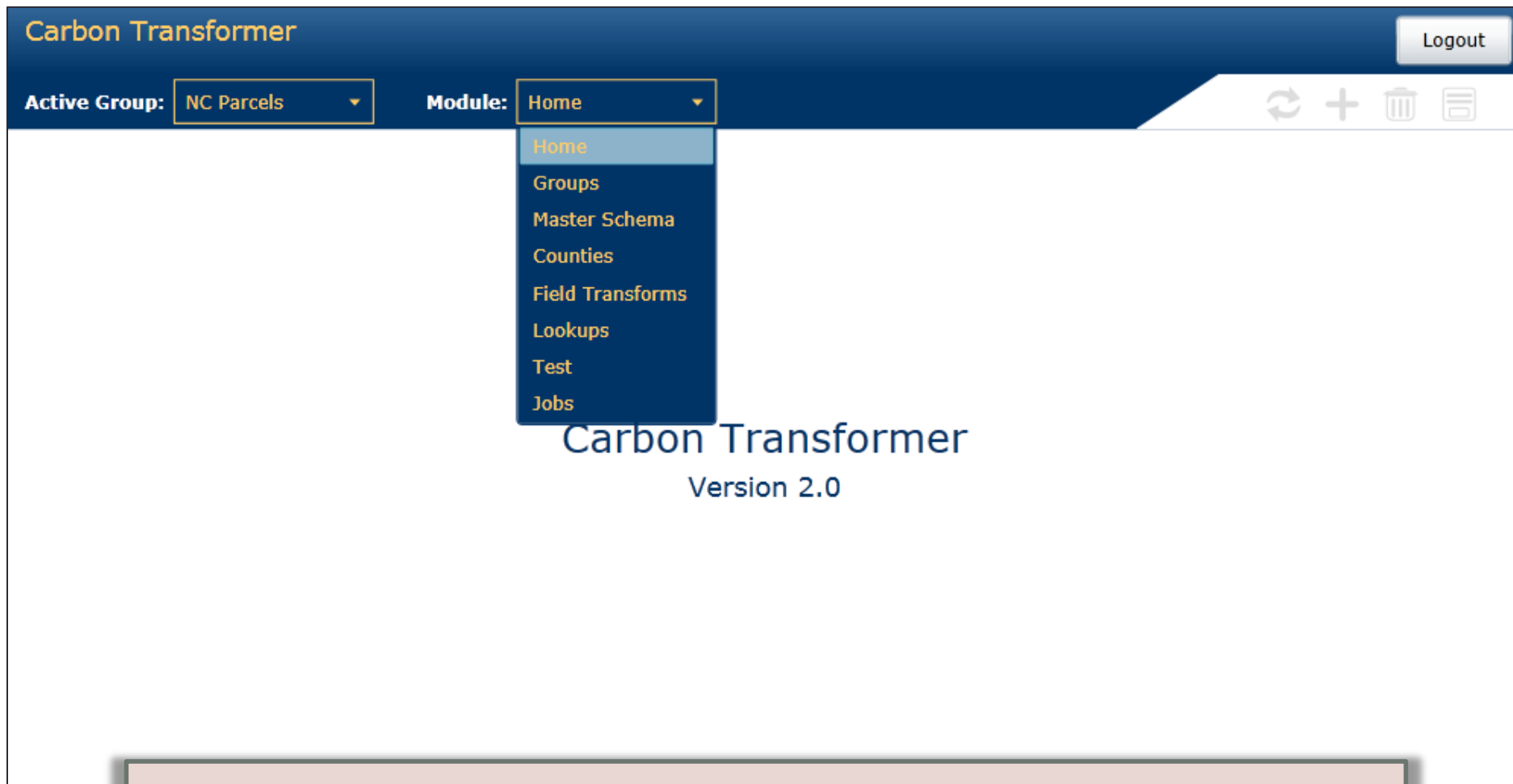
3

Transform Data

Cadastral Data Exchange



Cloud-based Transformer



Fully cloud-based set of tools...

Cloud-based Transformer

Carbon Transformer Logout

Active Group: NC Parcels Module: Groups

↺ + 🗑 📄

Available Groups

- NC Parcels
- NC Admin Boundary

Group Editor

Group Name:

NC Parcels

Group Description

North Carolina Parcels

Parcels 'Transform Group'... there can be others

Cloud-based Transformer

Carbon Transformer

Active Group: NC Parcels Module: Field Transforms

Logout

Select County: Henderson

Select Target: PARNO

Transforms

- CNTYNAME
- CNTYFIPS
- STCNTYFIPS
- GNISID
- SOURCEAGENT
- PARNO
- NPARNO
- ALTPARNO
- PARUSEDISC
- STRUCT
- IMPROVAL
- LANDVAL
- PARVAL
- OWNTYPE
- OWNNAME

Field [PIN] → +

Saves county schema, data and transforms to turn the local data into the standard

Cloud-based Transformer

Carbon Transformer

Active Group: NC Parcels Module: Field Transforms

Logout

Select County: Henderson

Select Target: OWNTYPE

Transforms

- CNTYNAME
- CNTYFIPS
- STCNTYFIPS
- GNISID
- SOURCEAGENT
- PARNO
- NPARNO
- ALTPARNO
- PARUSEDISC
- STRUCT
- IMPROVAL
- LANDVAL
- PARVAL
- OWNTYPE
- OWNNAME

IfThen

TOTAL_PROP > "0"

True

Static

"Taxable"

False

Static

"Non-Taxable"

```
graph LR; IfThen[TOTAL_PROP > "0"] -- True --> Static1[Static "Taxable"]; IfThen -- False --> Static2[Static "Non-Taxable"];
```

Multiple transform functions can be performed on county data to produce standard data content

County and Master Schema

County Schema (starting point)...

Carbon Transformer

Active Group: **NC Parcels** Module: **Counties**

Name:

Description:

Schema Fields

Field Name	Field Type	Description
shape	Surface	Surface geometry
PINNUM	String	
PIN	String	
PINEXT	String	
OWNER	String	
NMPTYPE	Integer	
TAXYEAR	String	
CONDOUNIT	String	
CONDOBUILD	String	

Available Counties

- Buncombe
- Camden
- Carteret
- Cherokee
- Craven
- Currituck
- Duplin
- Durham
- EBCI
- Franklin
- Greene
- Henderson
- Iredell
- Jackson
- Jones
- Lenoir

Carbon Transformer

Active Group: **NC Parcels** Module: **Master Schema**

Name:

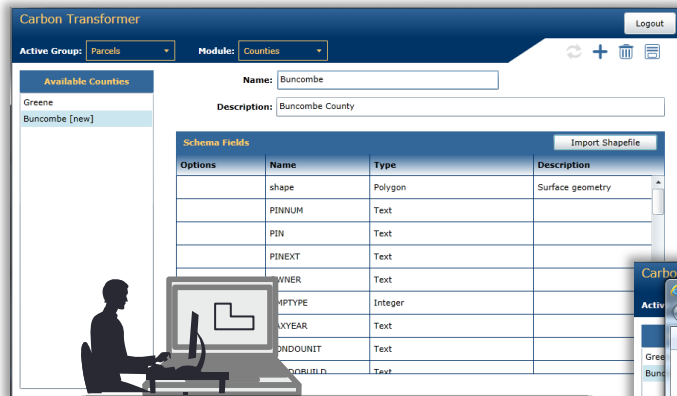
Description:

Schema Fields

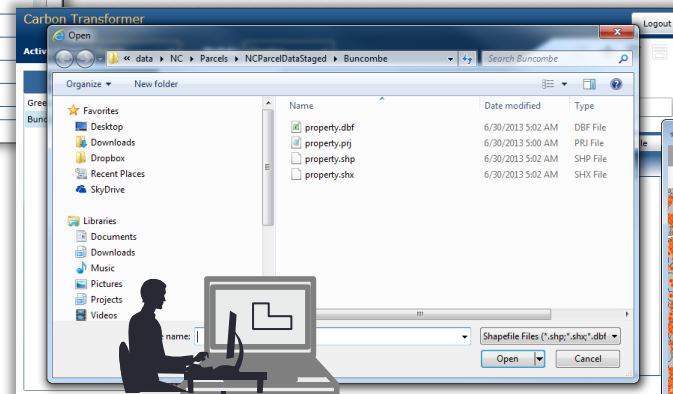
	Field Name	Field Type	Description
↑ ↓ 🗑️ ✎	STNAME	String	The state name
↑ ↓ 🗑️ ✎	STFIPS	String	The state FIPS code
↑ ↓ 🗑️ ✎	CNTYNAME	String	The name of the county
↑ ↓ 🗑️ ✎	CNTYFIPS	String	The county FIPS code - use lookup to set.
↑ ↓ 🗑️ ✎	STCNTYFIPS	String	Combination of the state and county FIPS codes.
↑ ↓ 🗑️ ✎	GNISID	Long	The GNIS identifier for the county. Use lookup table.
↑ ↓ 🗑️ ✎	SOURCEAGENT	String	The agency houses the source reference documents. This could be a clerk of c
↑ ↓ 🗑️ ✎	PARNO	String	The local parcel number for the parcel record.

Master Schema (ending point)...

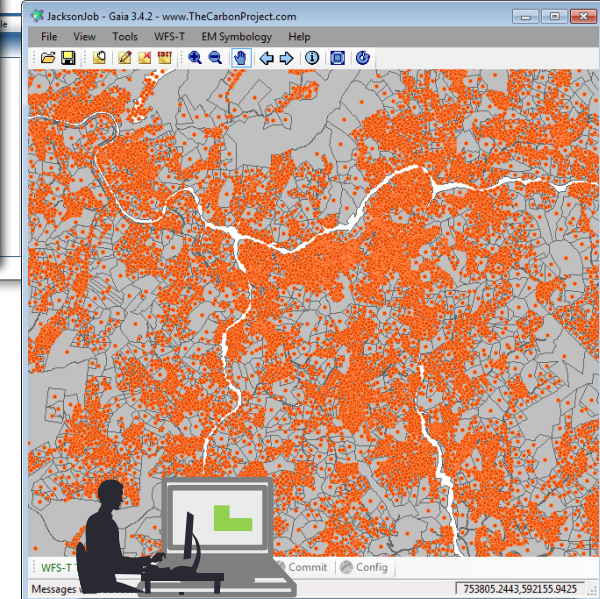
Running a 'Job'...



1

Select Schema

2

Upload Shapefile

3

Create Points/Transform

Jobs Output and Publishing...

Carbon Transformer

Logout

Active Group: NC Parcels

Module: Jobs



Select County:

Mecklenburg

Existing Jobs

Job #2137

Status: Completed

Submitted: 1/30/2014 3:32:43 PM

Completed: 1/30/2014 3:51:47 PM

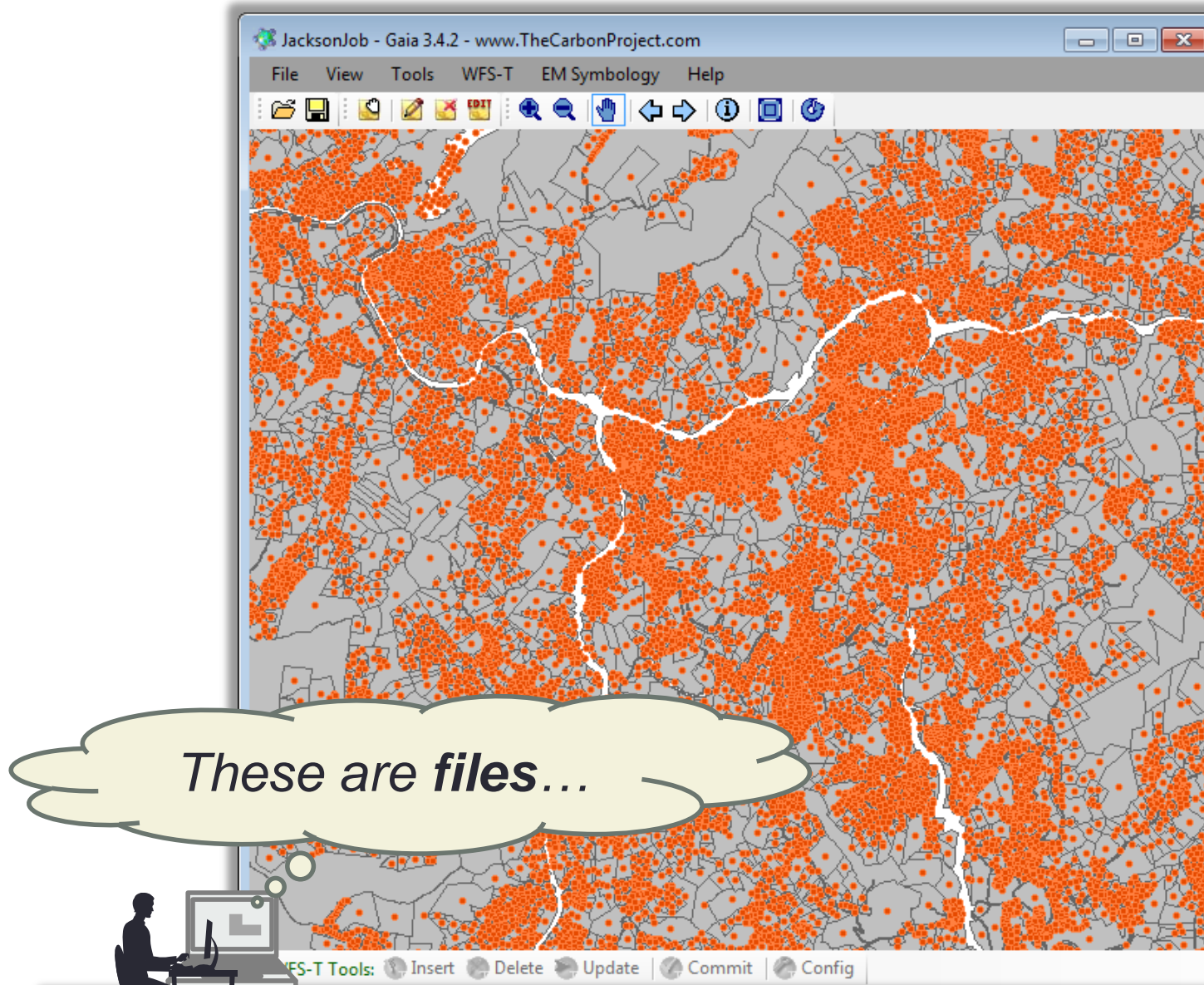
Published:

Publish

Size (bytes)	File name
296943583	nc_parcels_mecklenburg_01302014_203241.zip



Polygon and Point (automated on cloud) Shapefile output ...



Polygon and Point Shapefile output ...

Jobs Output and Publishing...

Carbon Transformer

Logout



Active Group: NC Parcels

Module: Jobs

Select County:

Polk

Existing Jobs

Job#1133

Status: Completed

Submitted: 1/28/2014 2:57:57 PM

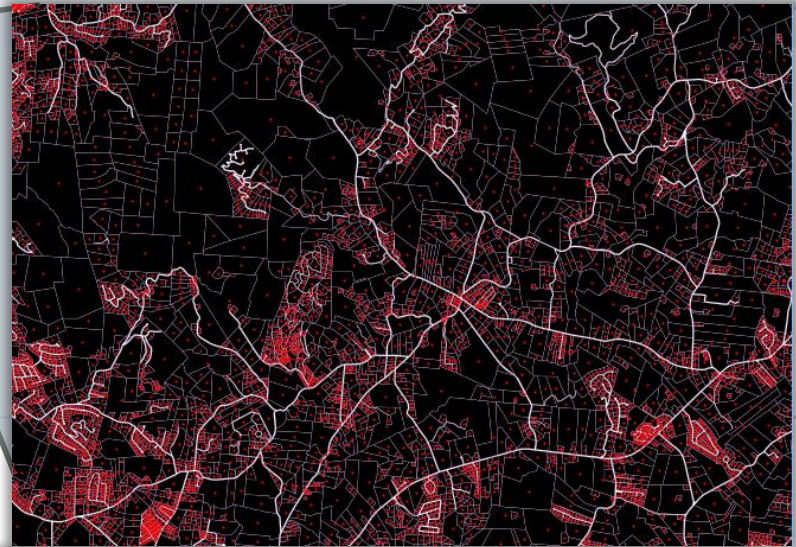
Completed: 1/28/2014 3:00:22 PM

Published:

Size (bytes)	File name
23619122	nc_parcels_polk_01282014_195756.zip

Publish

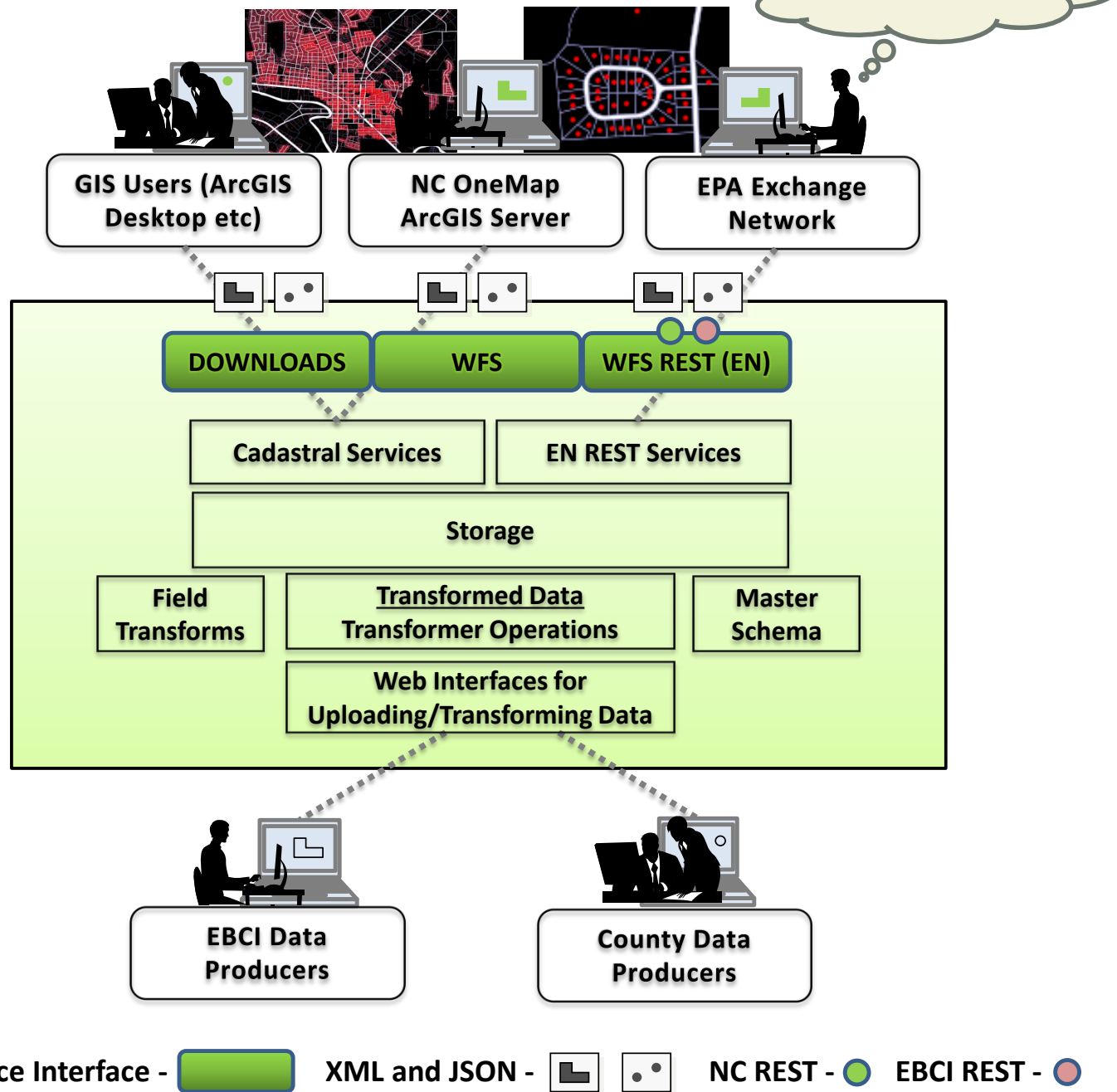
Lets make them
services...



Hit '**Publish**' to send the standard data to **WFS** and **EN REST**

RESTful APIs for 'Geo'...

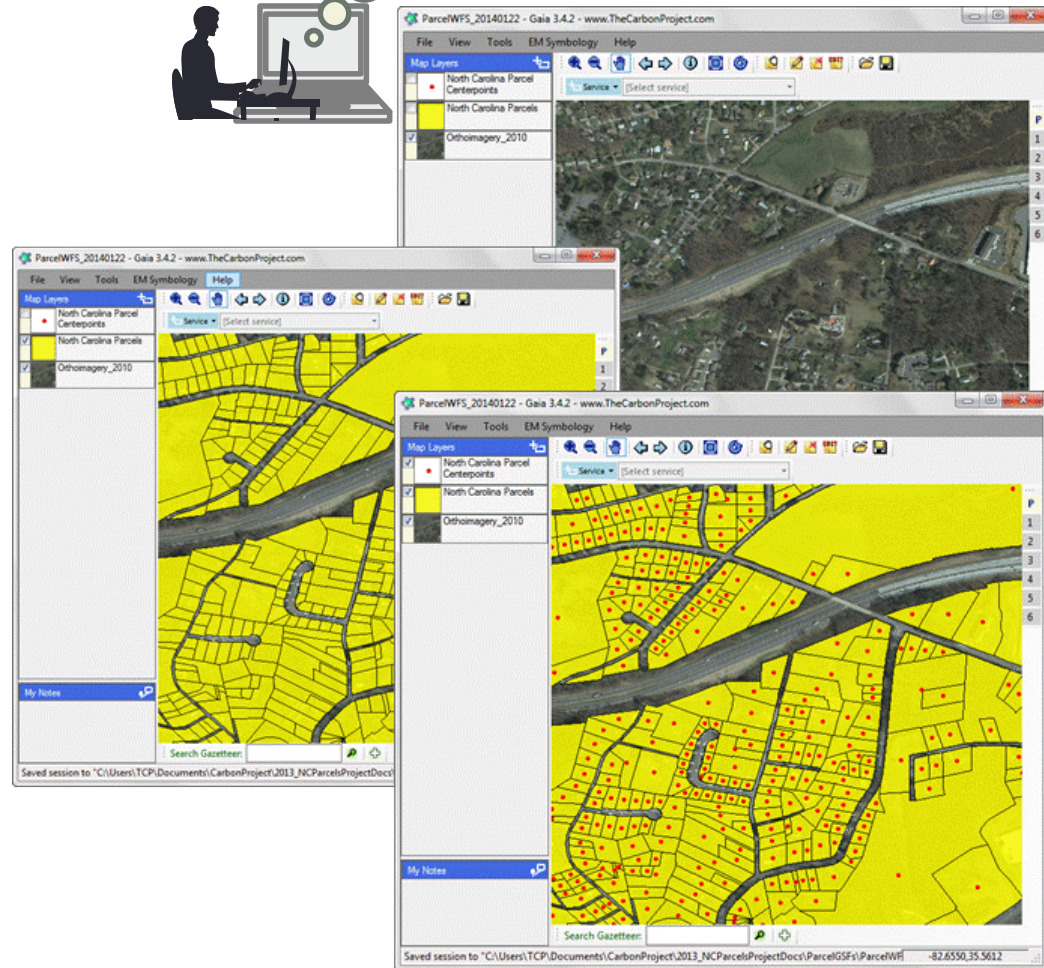
Services and Encodings



WFS

- Key service interface for Integrated Cadastral Data Exchange is Web Feature Service (WFS)
- Provides interactive *geographic features*, each of which is a representation of a “real-world” parcel
- Standard, well known Operations and Filters... has mostly used XML till now (like Exchange Network)

Lets get maps and some parcel points and polys from the Parcel WFS...





Parcel WFS – Quick Look on the Cloud

Carbon WFS Plus

Logout

Feature Types

	NAME	TITLE	GEOMETRY	PROJECTION
	ncparcels	North Carolina Parcels	MultiSurface	EPSG:2264
	ncparcelpoints	North Carolina Parcel Centerpoints	Point	EPSG:2264



FEATURE TYPES



SETTINGS



PROJECTIONS



JOBS

Carbon WFS Plus

Logout

Export data from [North Carolina Parcel Centerpoints]

General information

Output format: Json

Projection: Gml

Json

Kml

Shapefile

Carbon WFS Plus

Logout

Export data from [North Carolina Parcel Centerpoints]

Filter Builder

Select Filter Type: Spatial

Click the select button and click on the map to create a selection area.

Field: shape

Method: Within

End S

Beyond

Contains

Crosses

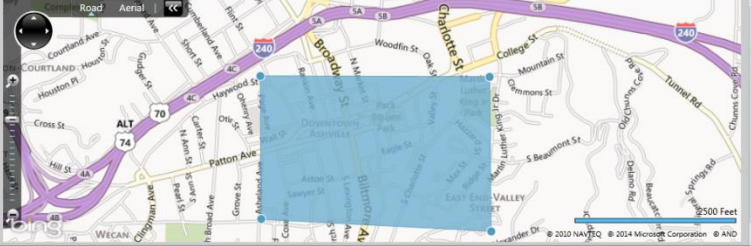
Disjoint

Intersects


Overlaps

Touches

Within



Accept Cancel

 NEW

 IMPORT

 EXPORT

 DELETE

EN REST

- Exchange Network recently released guidance to simplify the discovery and consumption of REST services
- Simple and easy-to-understand method of retrieving information
- Web browser, a web application or a mobile app can be used to access the service directly

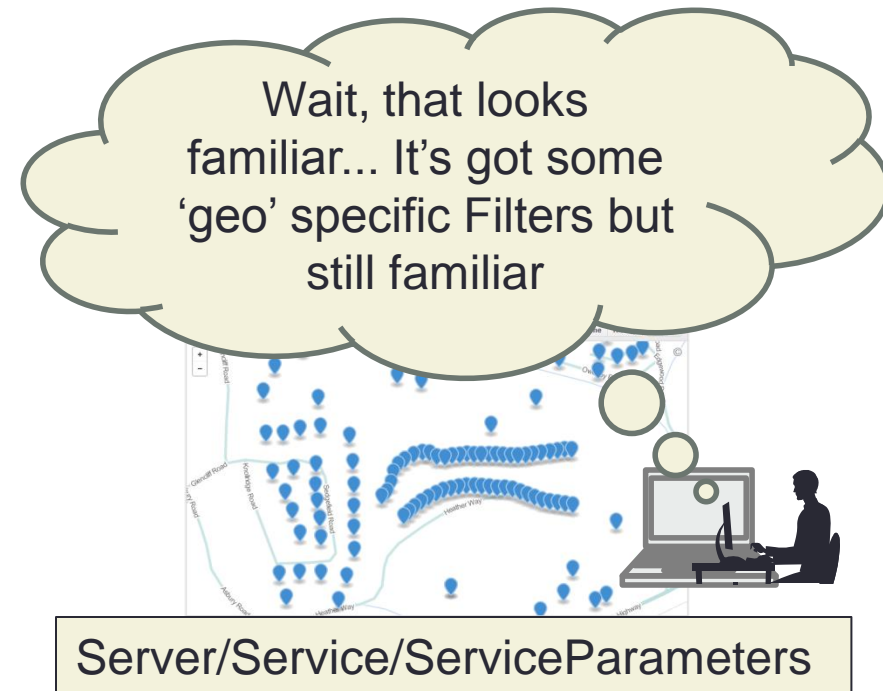


Server/Service/ServiceParameters

- HTTP://
 - GET
 - POST
 - PUT
 - DELETE

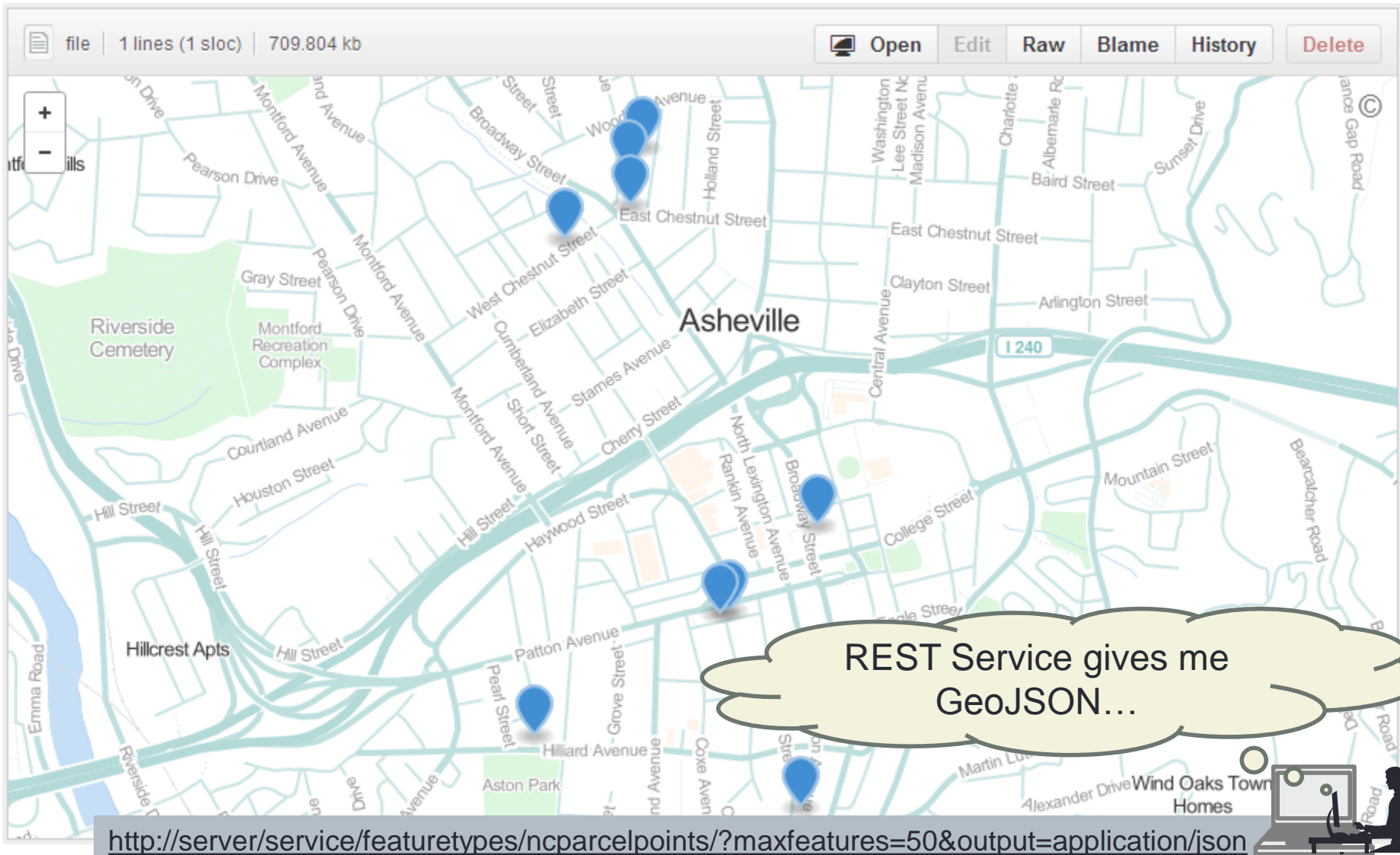
WFS REST

- OGC recently released WFS Change Proposal to simplify consumption of REST geospatial services
- Simple and easy-to-understand method of retrieving information
- Web browser, a web application or a mobile app can be used to access the service directly



- HTTP://
 - GET
 - POST
 - PUT
 - DELETE

Put them together... maybe on GitHub



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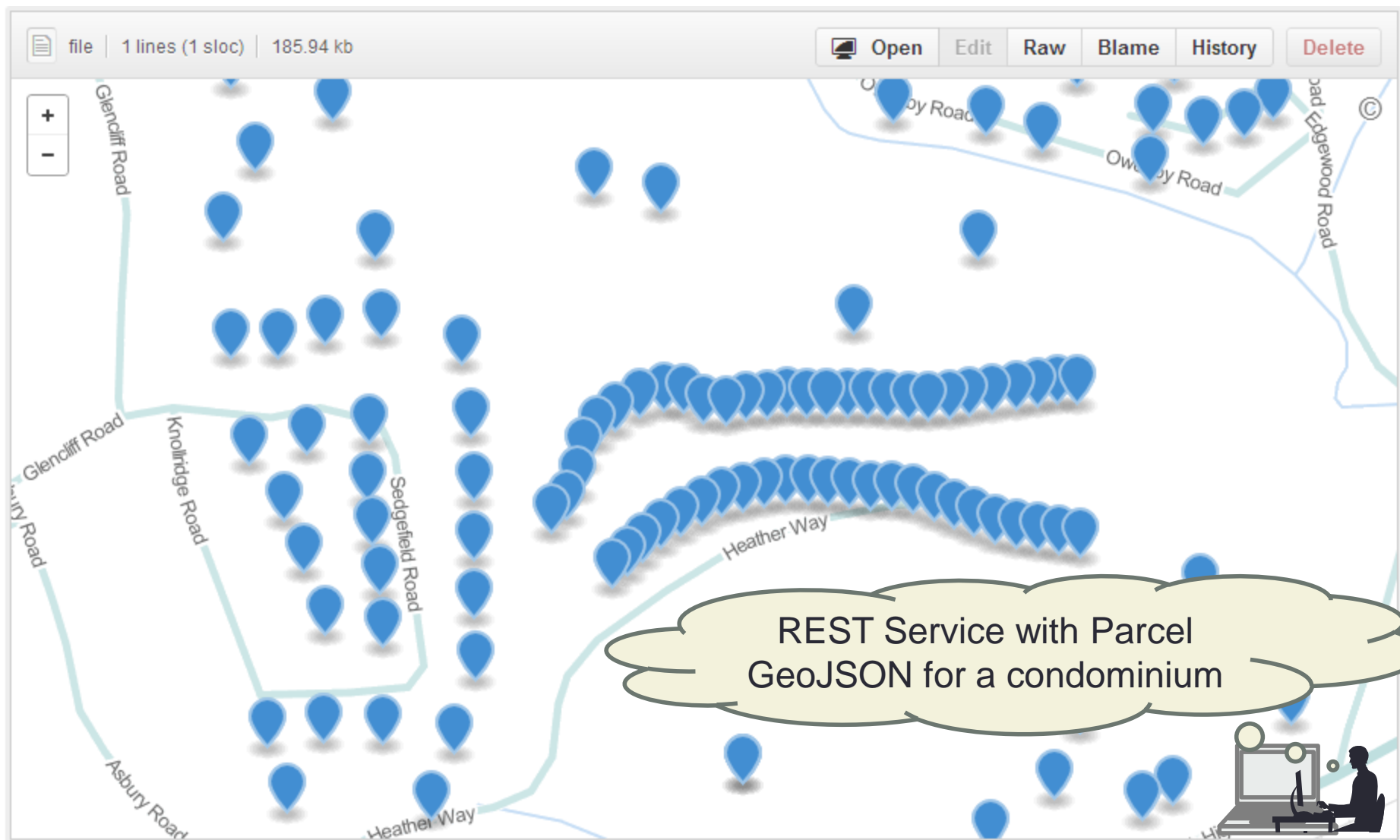
Open Edit Raw Blame History Delete

Asheville

REST Service gives me GeoJSON...

<http://server/service/featuretypes/ncparcelpoints/?maxfeatures=50&output=application/json>

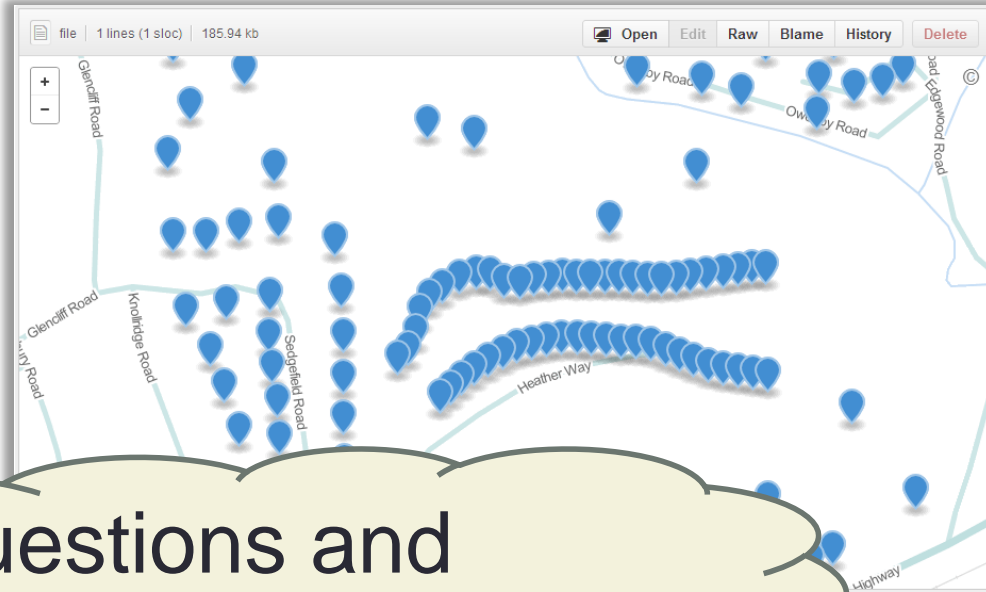
Parcel GeoJSON and OpenStreetMap



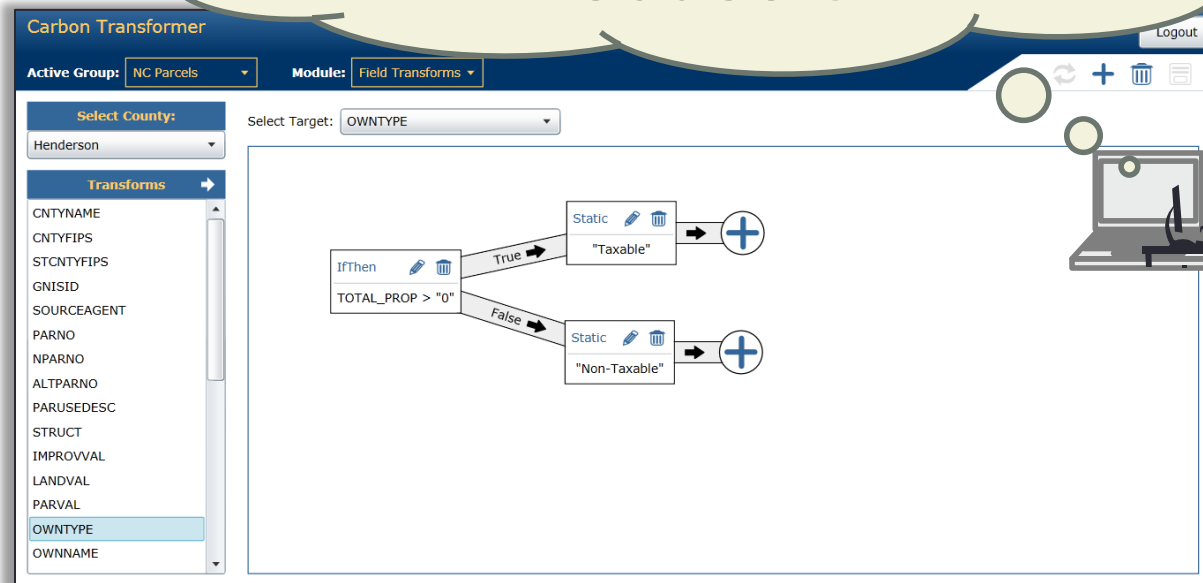
Benefits in NC and EN

- Standard data fields – consistent for multi-county/state areas
- Web services with statewide/nationwide parcels
- Data consumers
 - Business uses range from environmental assessment, emergency response, to many other government and commercial functions
- Application developers
 - Much easier to create applications that solve problems
 - Reusable services and cloud

Cloud-based EN REST geospatial services offer opportunity for enhanced public-private partnerships, with cost/time savings



Questions and Discussion?



EPA PARCELS PROJECT

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