

USDA Forest Service

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# PLANNING IN THE WILDLAND-URBAN INTERFACE



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# Wildland-Urban Interface— data and trends

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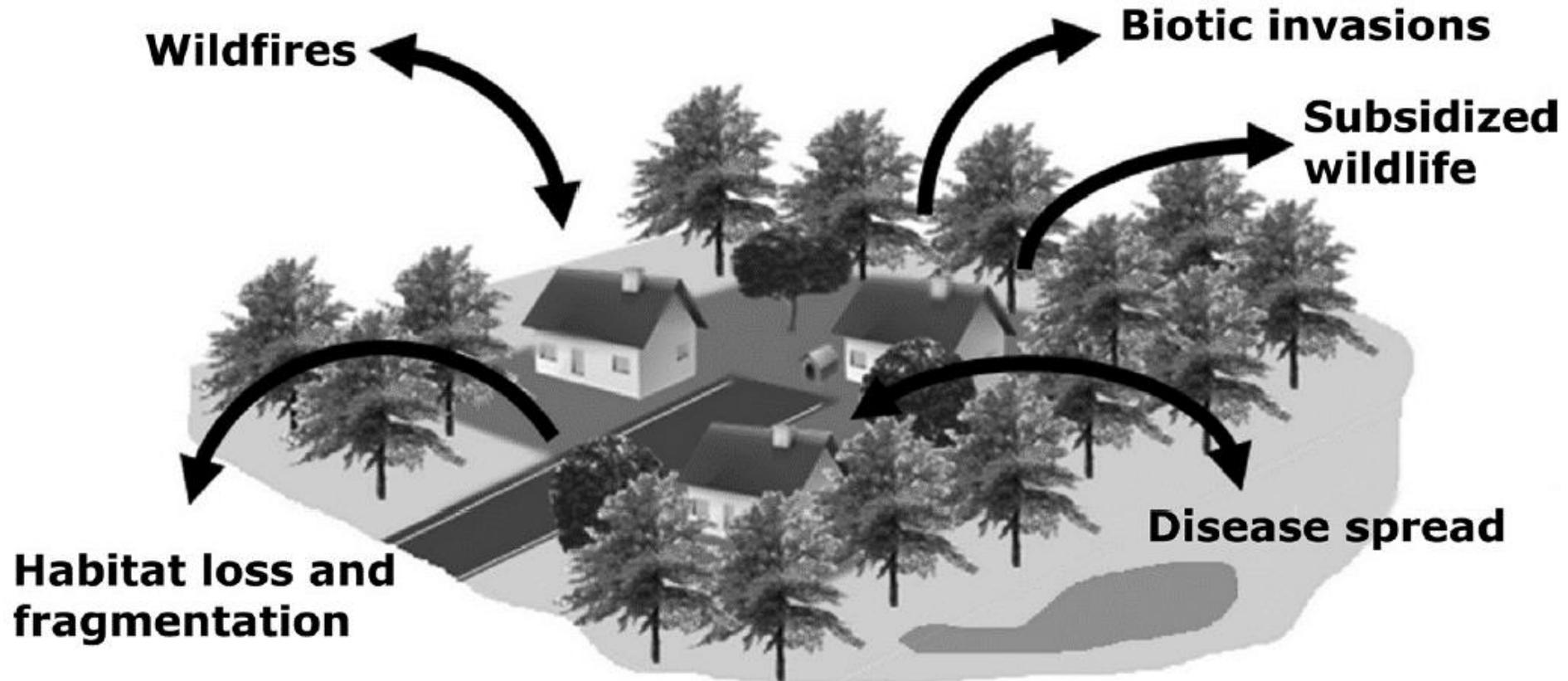


# Wildland-Urban Interface (WUI)

*“Where houses meet or intermingle with undeveloped wildland”*  
-Federal Register (66:751, 2001)



# Why does the WUI matter?



# Wildfire trends

## US Loss-Causing Wildfires (1960-2017)

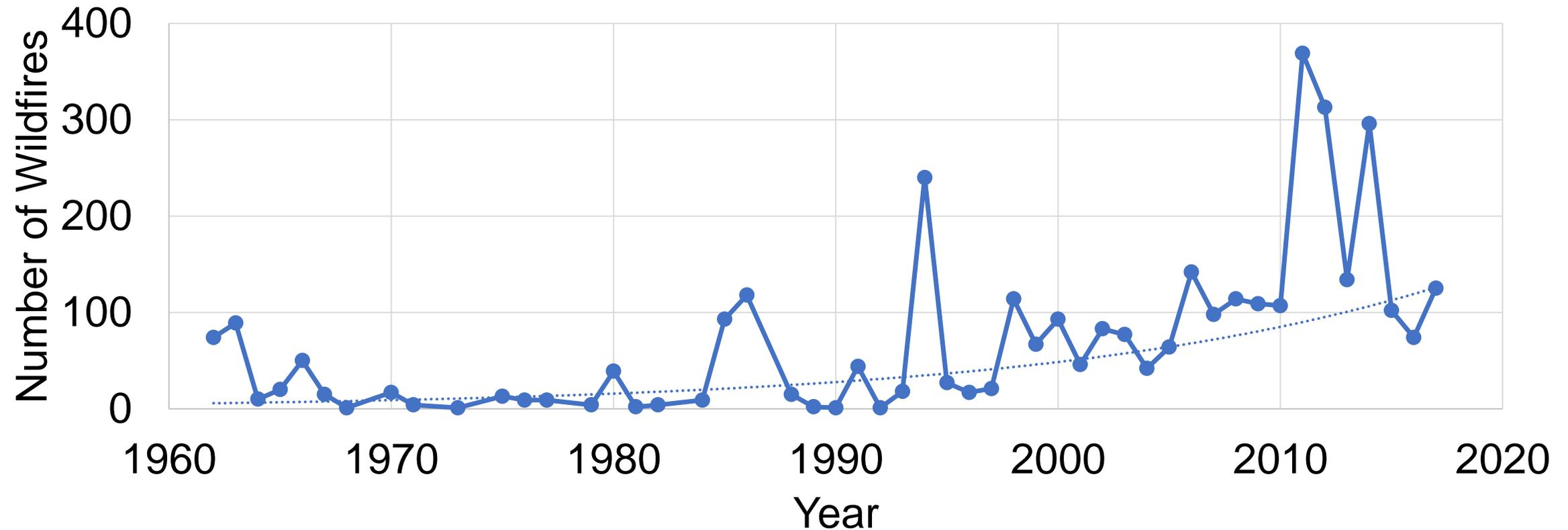


Figure 3: Annual number of loss-causing US wildfires, 1960-2017. Loss-causing wildfires denote events with measurable property damages and/or human casualties. Source: SHELDUS, Version 17.0. Loss estimates derive from National Centers for Environmental Information (formerly National Climatic Data Center) *Storm Data and Unusual Weather Phenomena*, published monthly. From Schumann et al *in review*.

# Mapping the WUI, 1990-2000-2010

- Federal Register, 2001 definition
- At least one home per 40 acres or more
- Is housing intermingled with or adjacent to wildland vegetation?
- Housing data at Census block
- Vegetation from National Land Cover Database

# Why map housing and vegetation?

## West Virginia

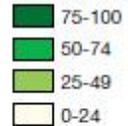
Eastern Region



### Wildland Vegetation

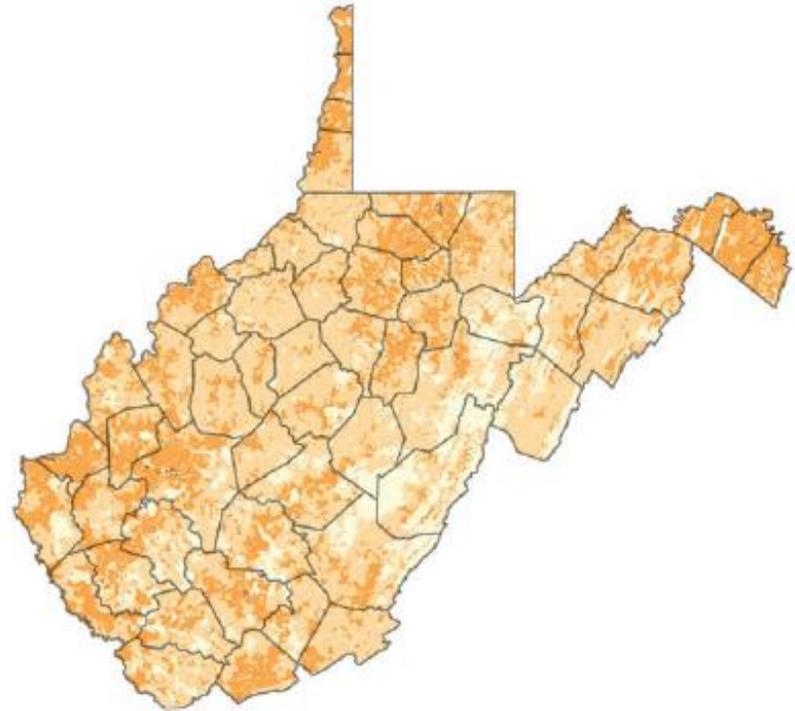
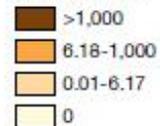
#### Cover

(per Census block, %)



### Housing Density

(houses per km<sup>2</sup>)



# Mapping the WUI, 1990-2000-2010

>1 house per 40 acres  
>50% wildland vegetation

**Intermix** WUI - “where houses mingle”



>1 house per 40 acres  
<50% wildland vegetation

**Interface** WUI - “where houses meet”

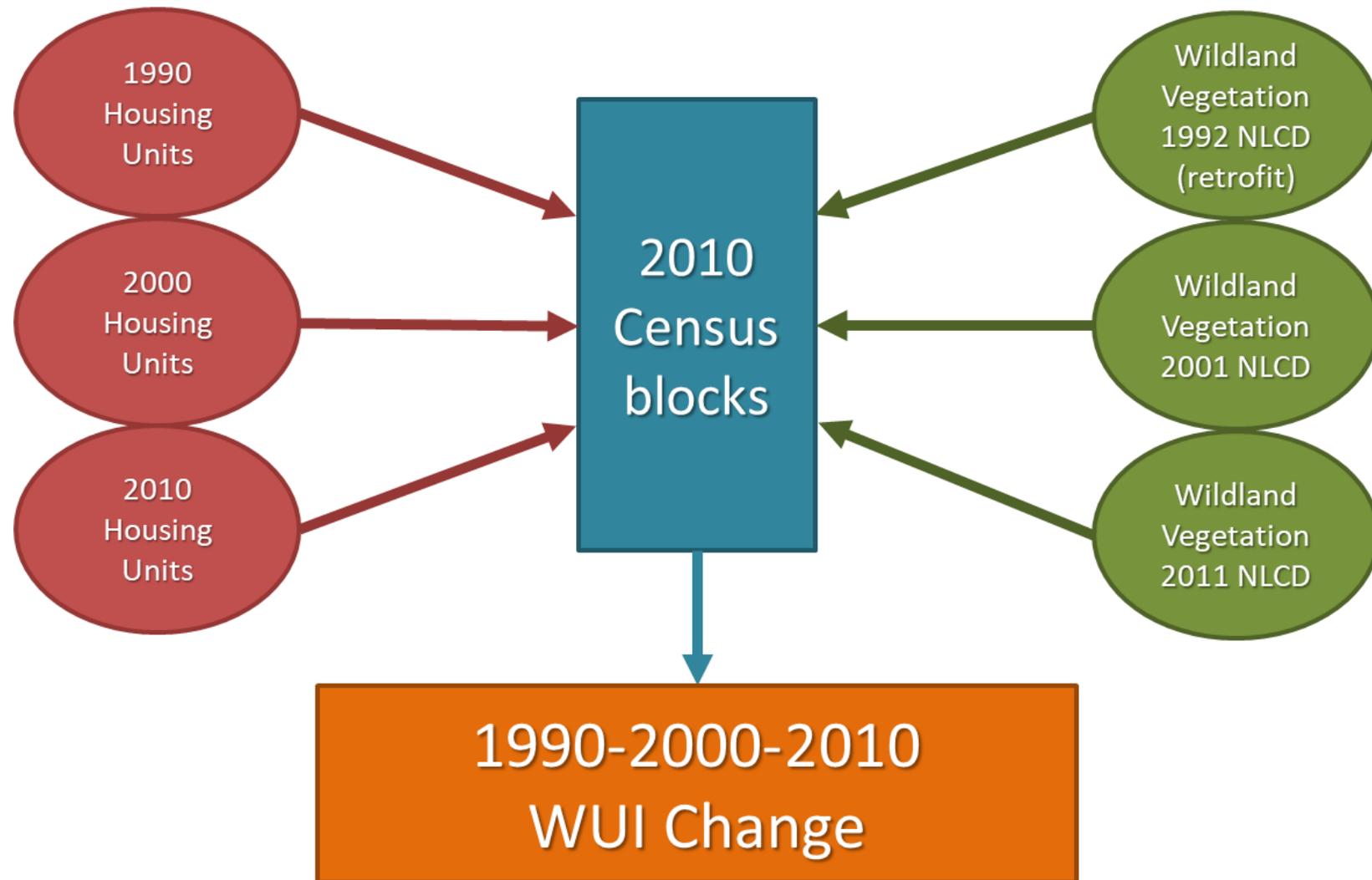


Within 1.5 miles

>75% wildland vegetation  
>500 hectares

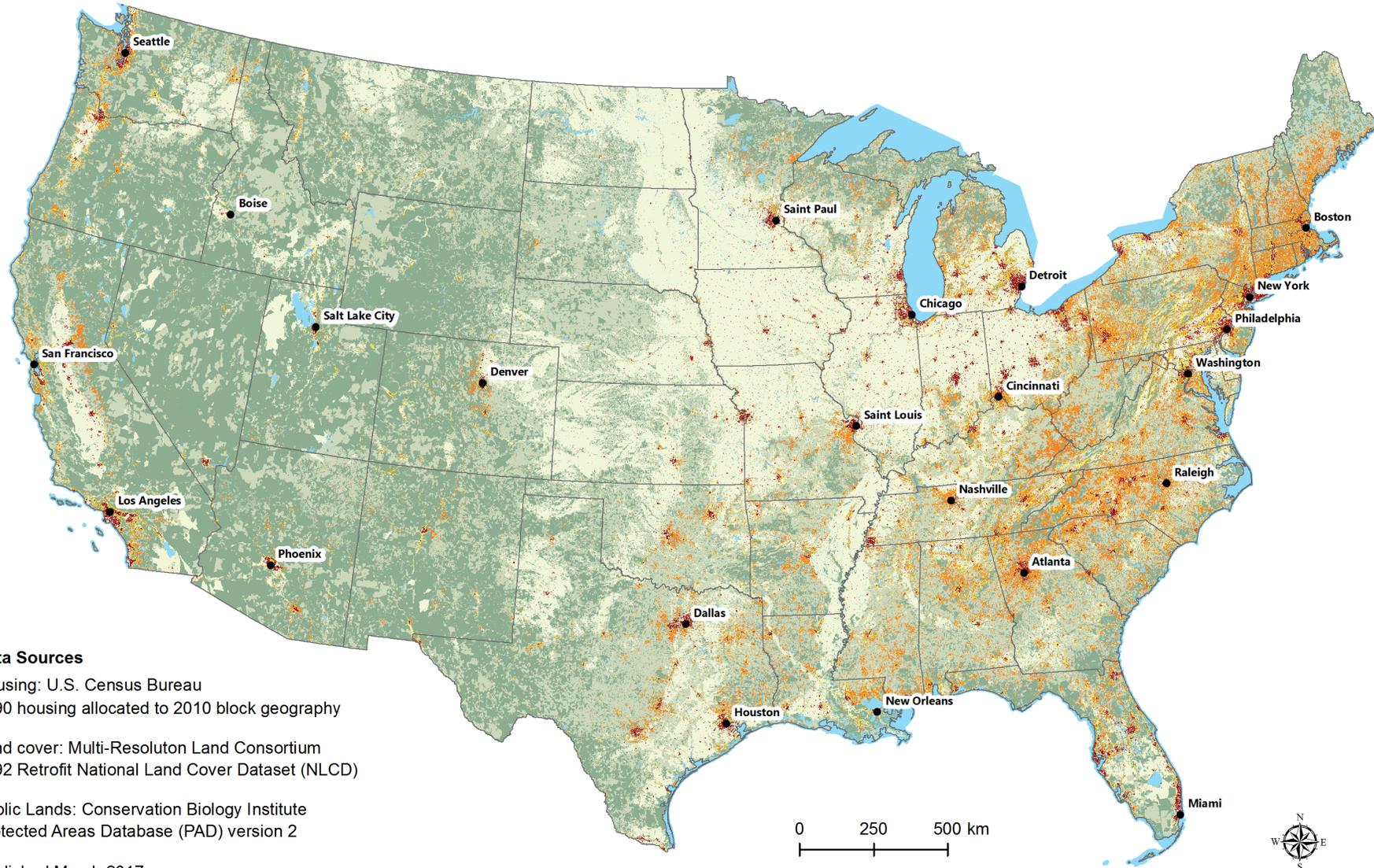
# Mapping the WUI, 1990-2000-2010

Housing  
(Census) +  
Vegetation  
(National  
Land Cover  
Database) =  
WUI location,  
extent, and  
change over  
time



# Results

# The 1990 Wildland-Urban Interface of the Conterminous United States



## Data Sources

Housing: U.S. Census Bureau  
1990 housing allocated to 2010 block geography

Land cover: Multi-Resolution Land Consortium  
1992 Retrofit National Land Cover Dataset (NLCD)

Public Lands: Conservation Biology Institute  
Protected Areas Database (PAD) version 2

Published March 2017

## Contacts

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## Wildland-Urban Interface (WUI)

Interface  
Intermix

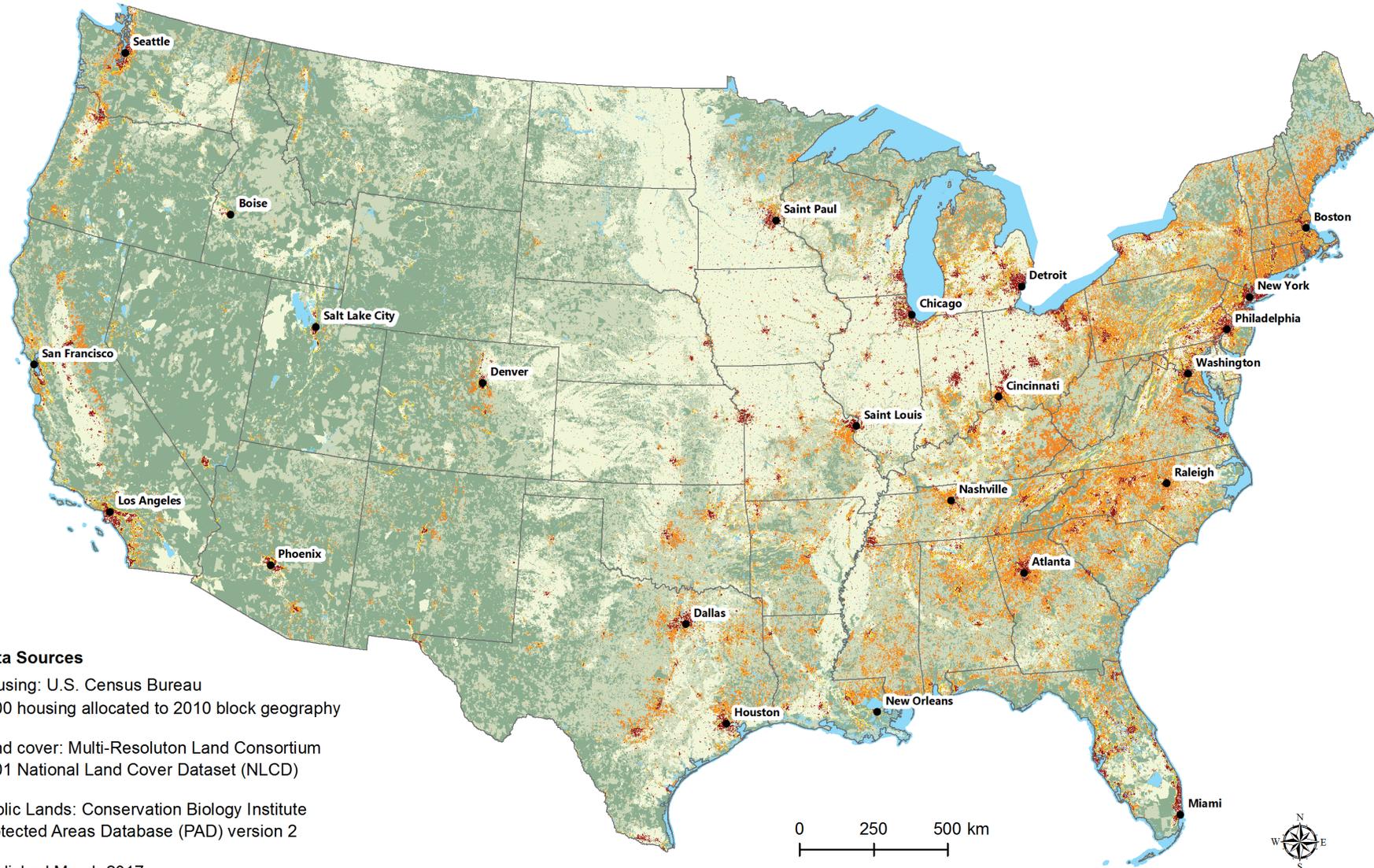
## Non-WUI Vegetated

No housing  
Very low housing density

## Non-vegetated or Agriculture

Low and very low housing density  
Medium and high housing density  
Water

# The 2000 Wildland-Urban Interface of the Conterminous United States



## Data Sources

Housing: U.S. Census Bureau  
2000 housing allocated to 2010 block geography

Land cover: Multi-Resolution Land Consortium  
2001 National Land Cover Dataset (NLCD)

Public Lands: Conservation Biology Institute  
Protected Areas Database (PAD) version 2

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## Wildland-Urban Interface (WUI)

- Interface
- Intermix

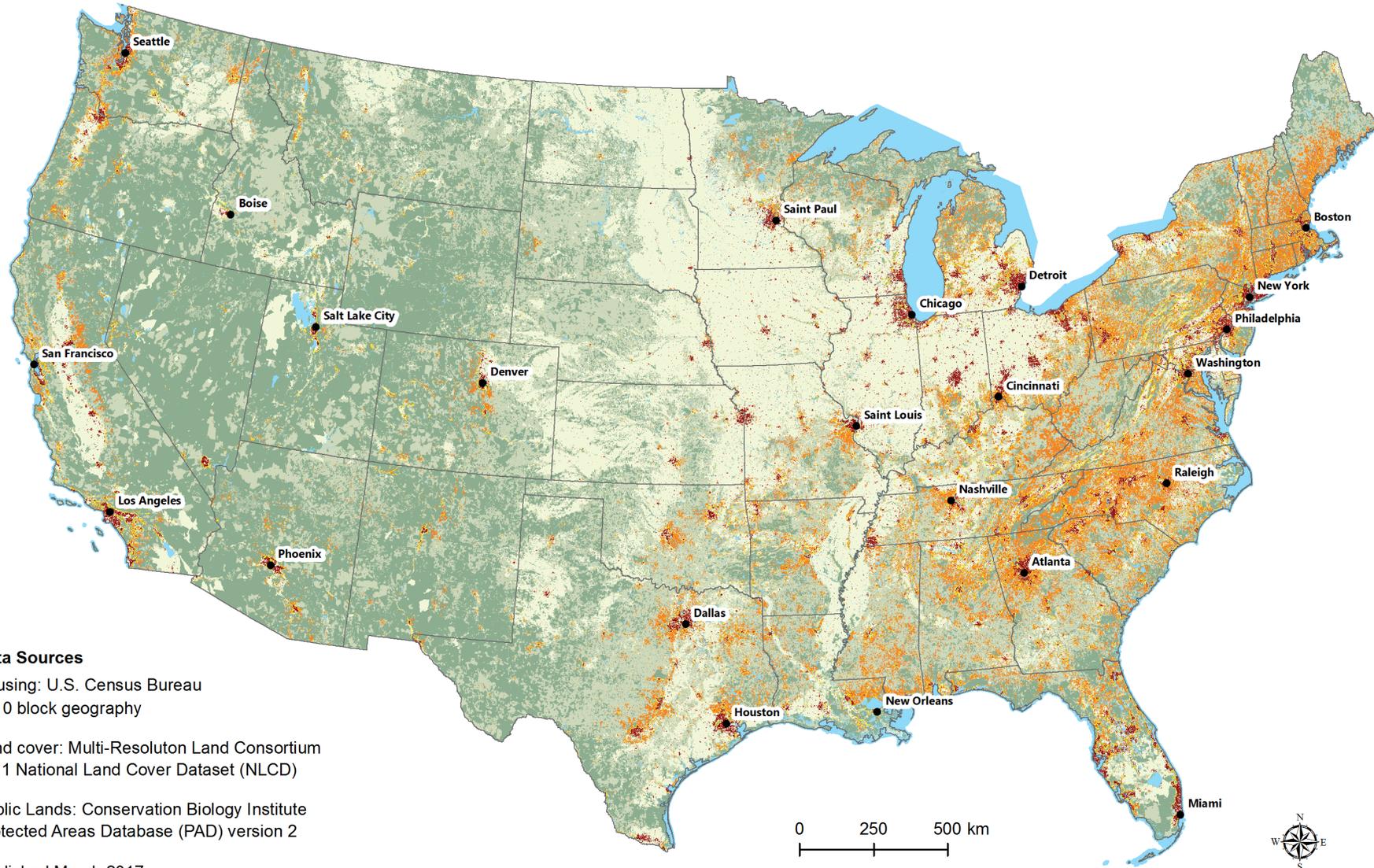
## Non-WUI Vegetated

- No housing
- Very low housing density

## Non-vegetated or Agriculture

- Low and very low housing density
- Medium and high housing density
- Water

# The 2010 Wildland-Urban Interface of the Conterminous United States



## Data Sources

Housing: U.S. Census Bureau  
2010 block geography

Land cover: Multi-Resoluton Land Consortium  
2011 National Land Cover Dataset (NLCD)

Public Lands: Conservation Biology Institute  
Protected Areas Database (PAD) version 2

Published March 2017

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## Wildland-Urban Interface (WUI)

- Interface
- Intermix

## Non-WUI Vegetated

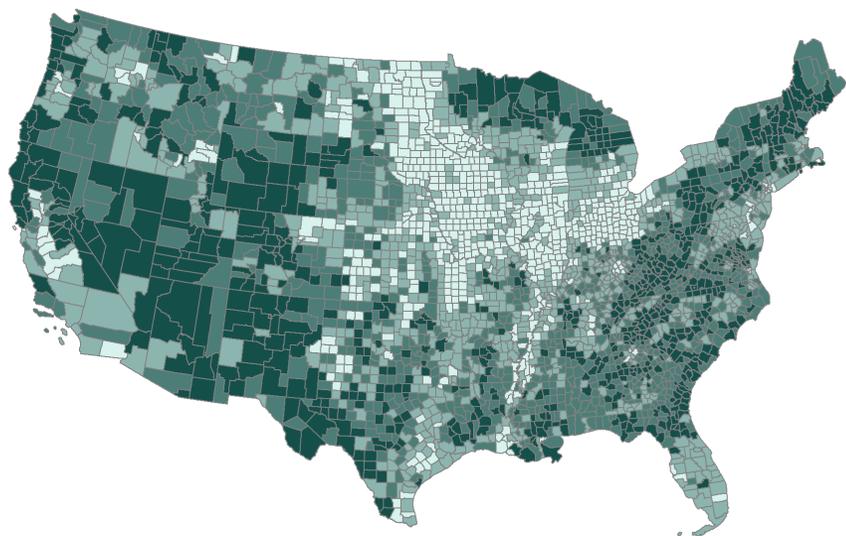
- No housing
- Very low housing density

## Non-vegetated or Agriculture

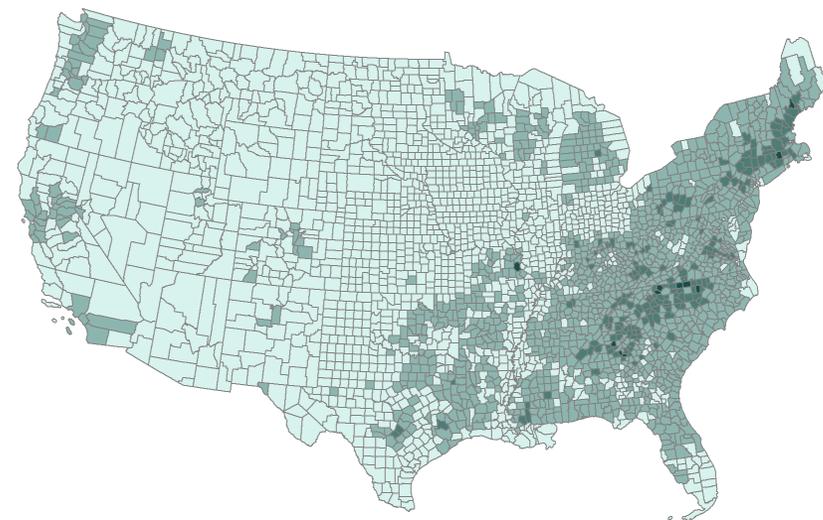
- Low and very low housing density
- Medium and high housing density
- Water

# Housing vs. area trends, 2010

Homes  
in  
WUI

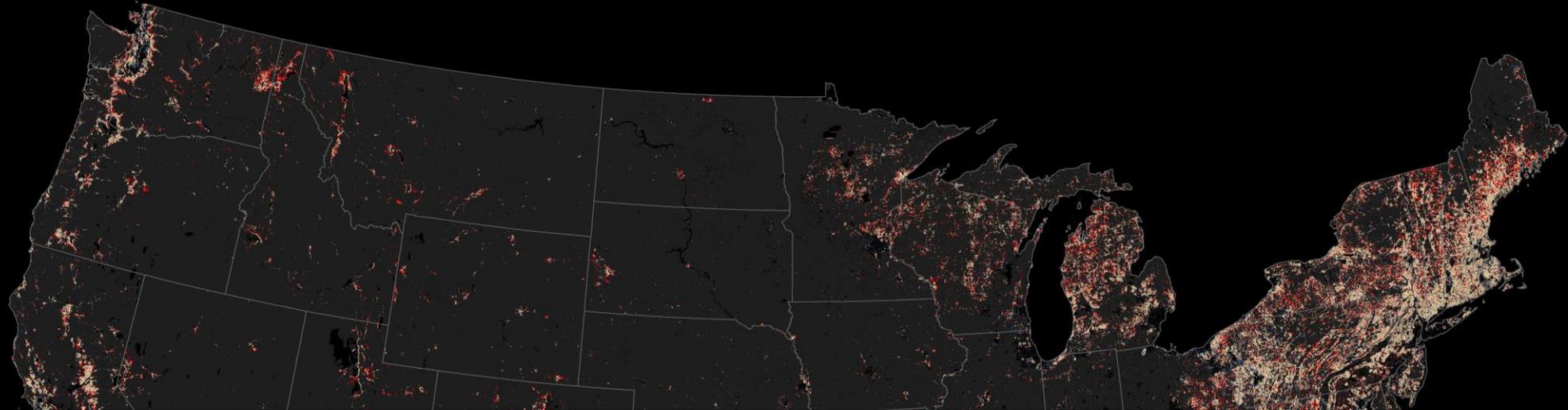


WUI  
area



Proportion of county in 2010  
(in percent)

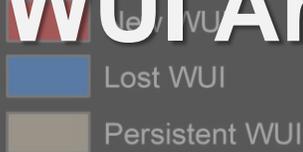




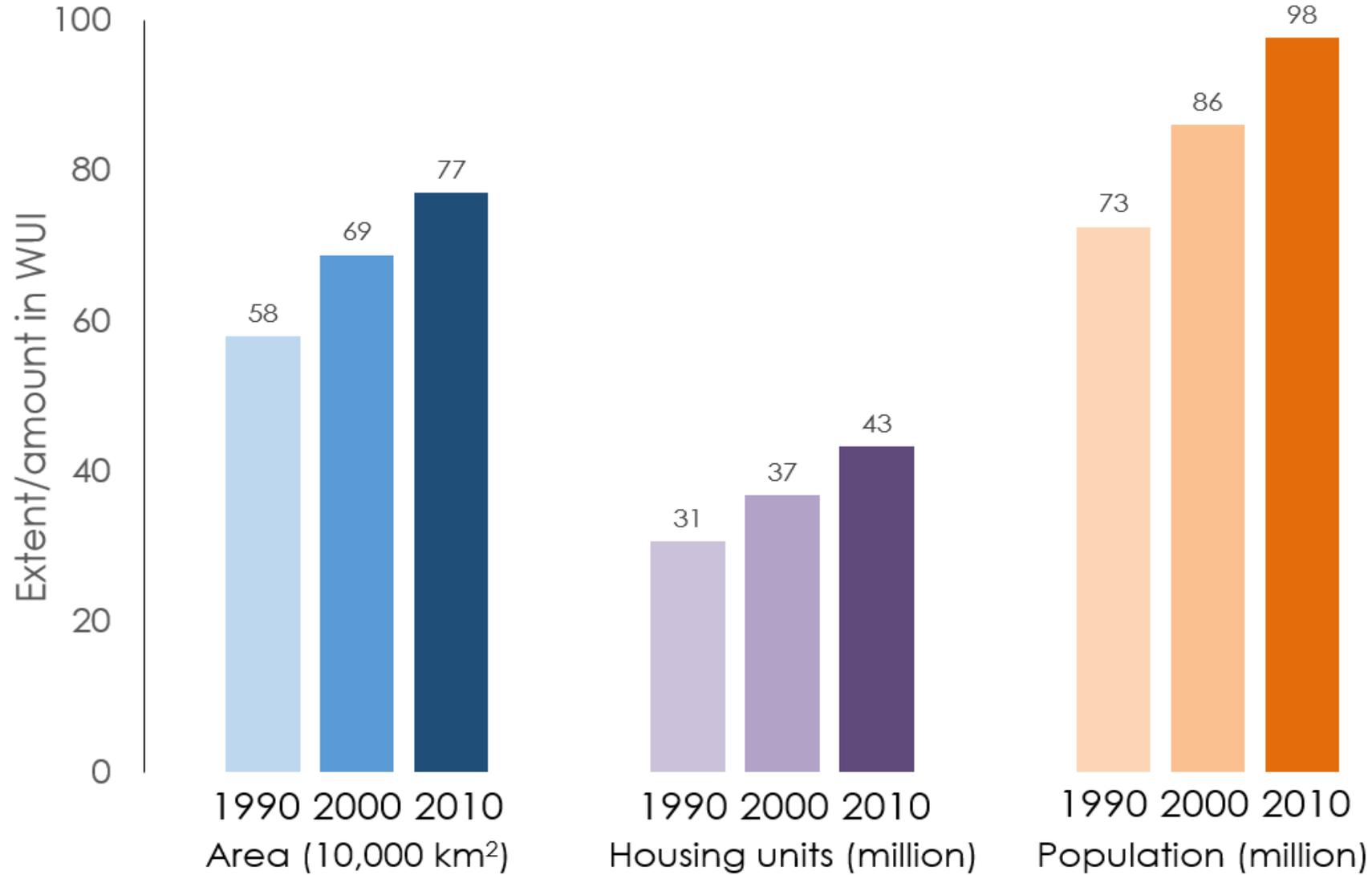
**U.S. WUI grew rapidly from 1990 to 2010:**

**WUI Houses: 30.8 to 43.4 million  
41% growth**

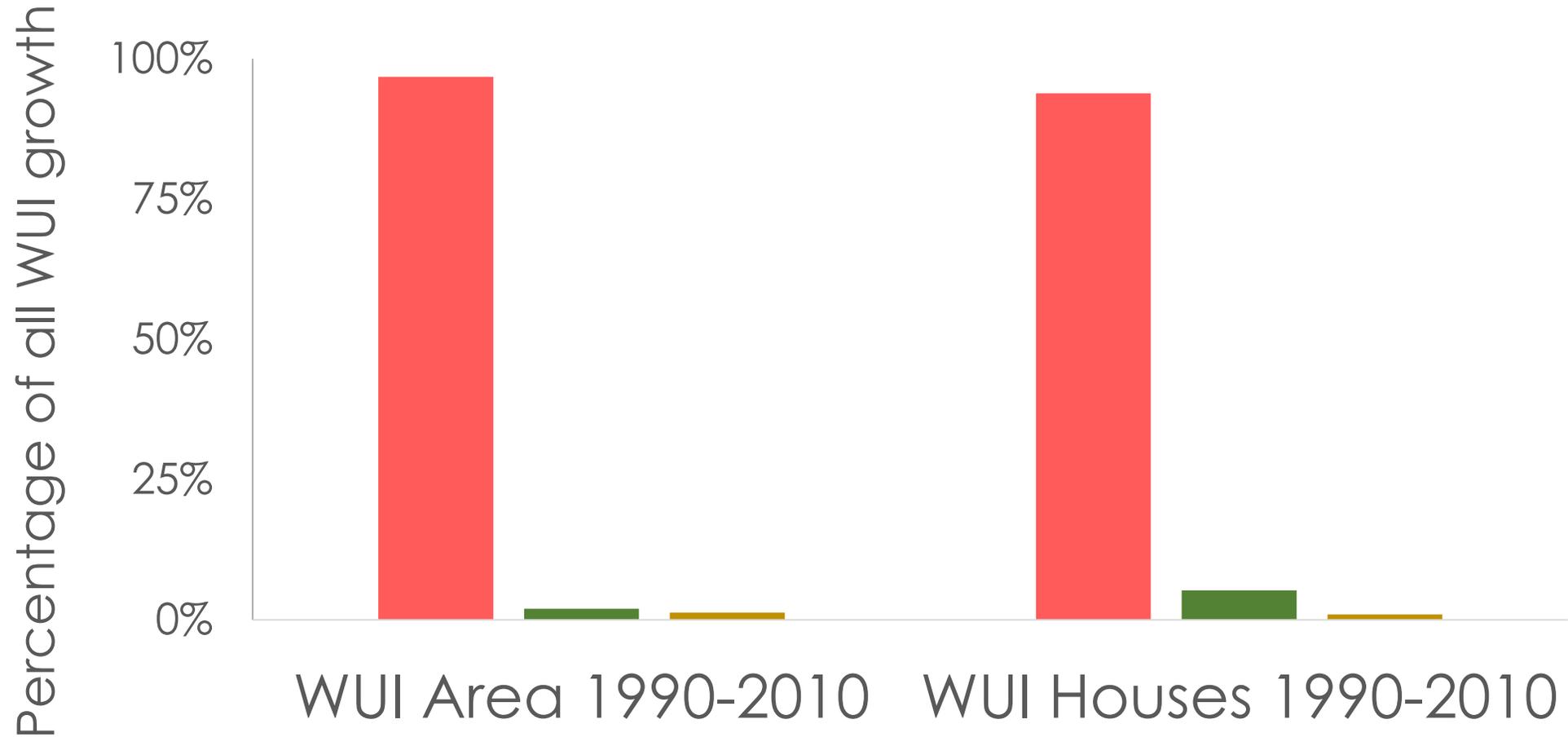
**WUI Area: 581,000 to 770,000 km<sup>2</sup>  
33% growth**



# National WUI Growth

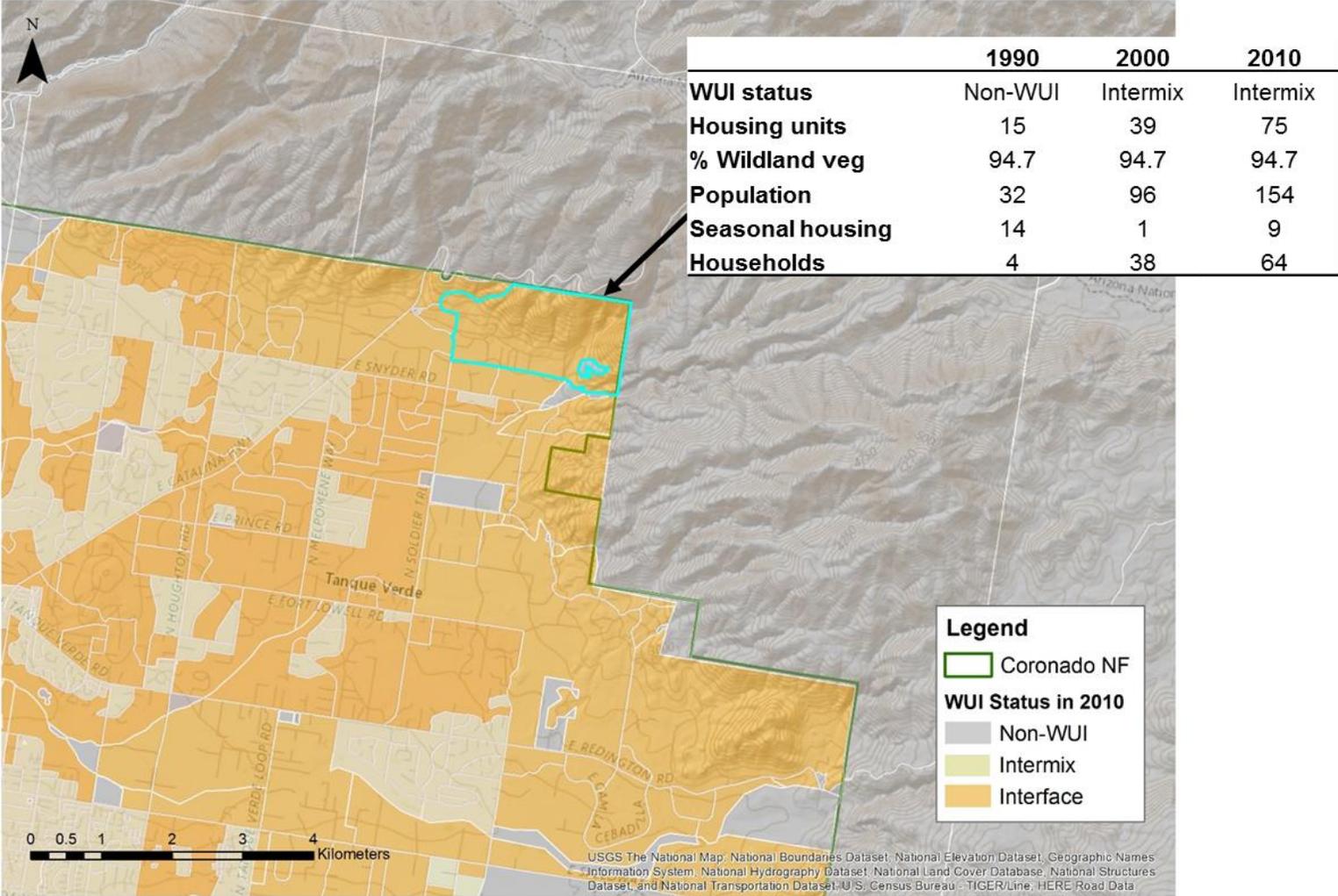


# Causes of WUI growth



■ Due to Housing growth ■ Change in vegetation ■ Due to both

# Fine-scale data on WUI change



# What next?

- Fire trends today do not reflect tomorrow's development or climate.
- Role for planners across landscapes—in areas with and without wildfire issues
- Newer data
  - 2020 Census
  - High resolution WUI mapping

# Data and more information

## Data:

For those who use AGOL or Google Earth

<https://apps.fs.usda.gov/arcx/rest/services/EDW>

Archived as geodatabase

<https://www.fs.usda.gov/rds/archive/Product/RDS-2015-0012-2>

## Maps, publications, etc:

<https://www.fs.usda.gov/treesearch> & <https://www.nrs.fs.fed.us/data/wui/>

<http://silvis.forest.wisc.edu/>

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