



Economic Impact of Floods & Solutions that work

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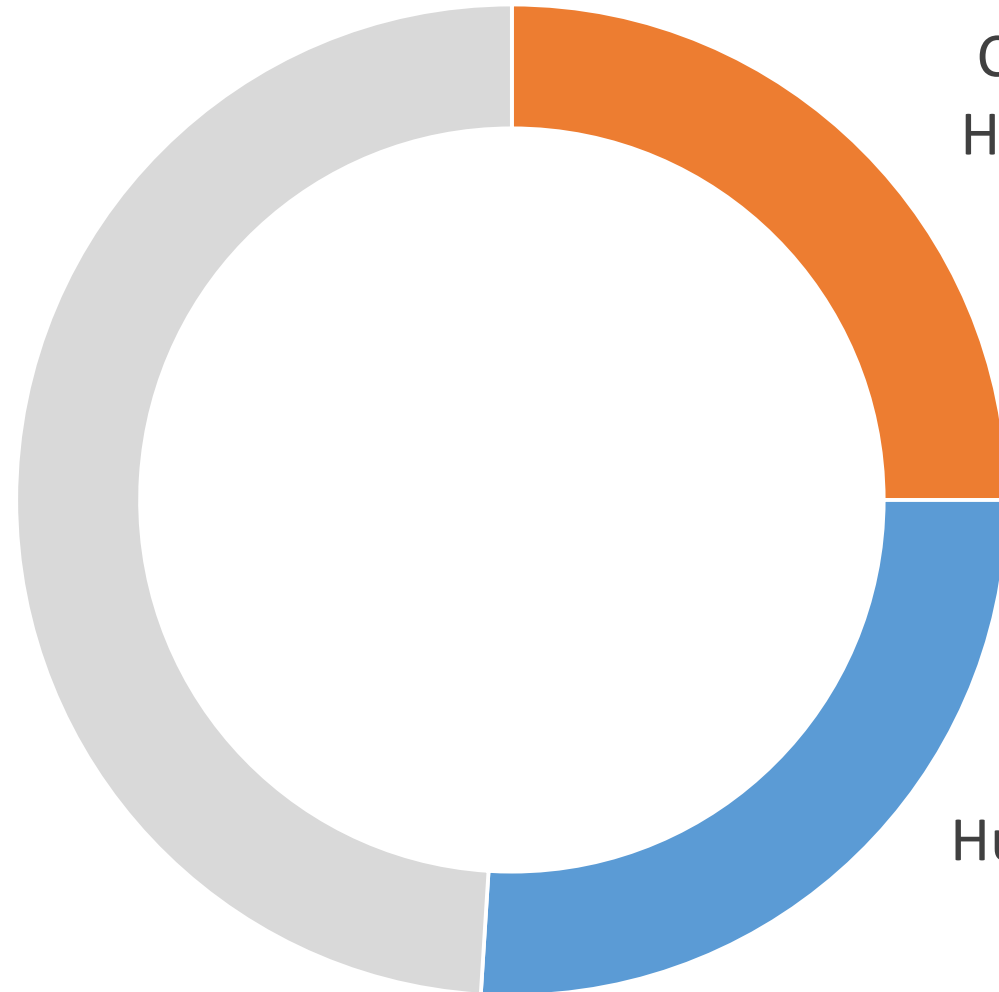
“ What economic values are at stake? ”



51%

**Annual Direct
Economic Loss
from Natural
Hazards
1960-2009**

All other
hazards,
49%

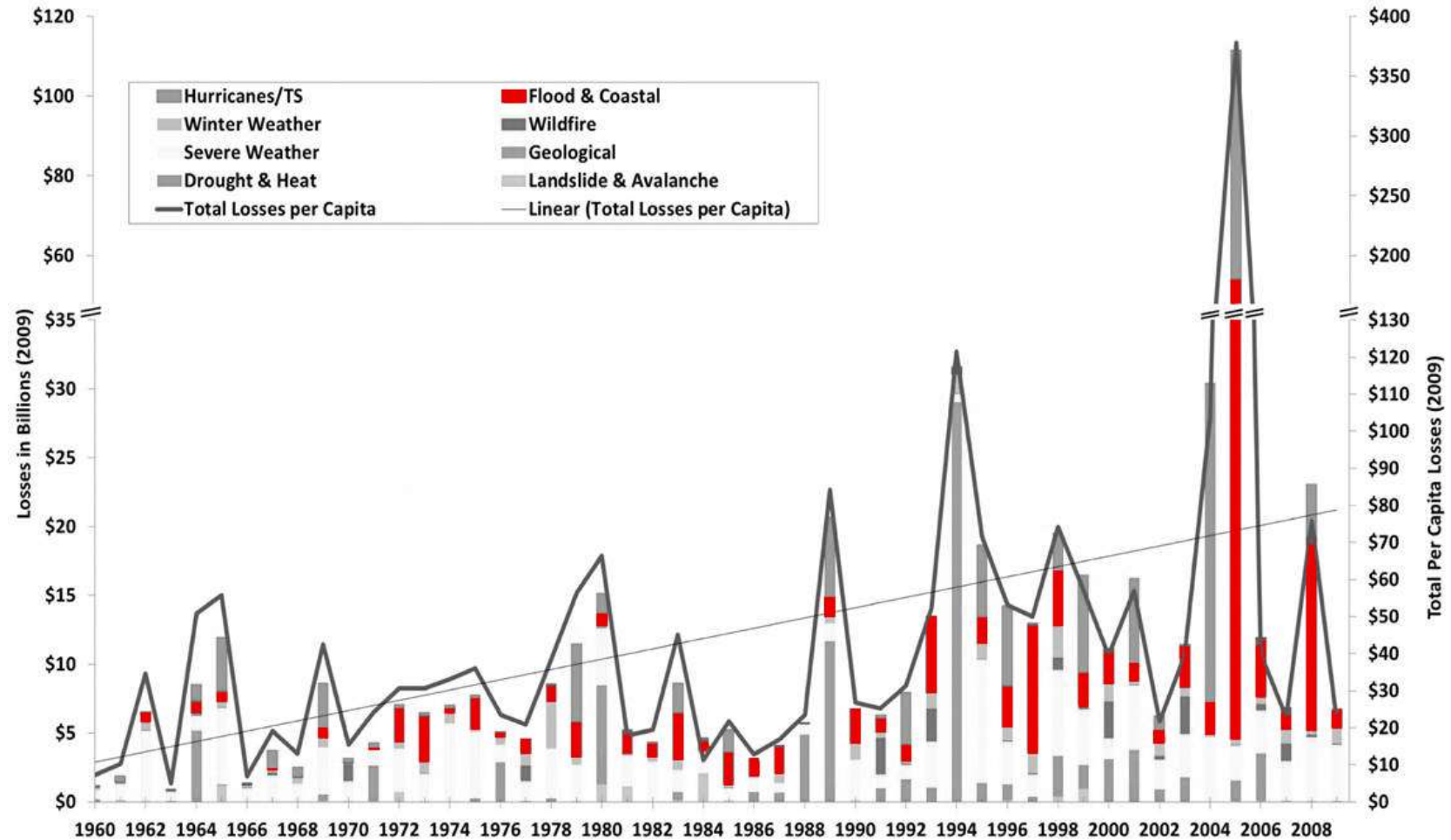


Flooding &
Coastal
Hazards,
25%

Hurricanes,
26%

Increasing Trend in Annual Direct Economic Loss

**Projected
\$300- \$400
Billion losses
Nationally
within a decade**



In 2014 dollars

Source:

Gall et al, 2011, "The Unsustainable Trend of Natural Losses in the United States," Sustainability 3(11) 2157-2181

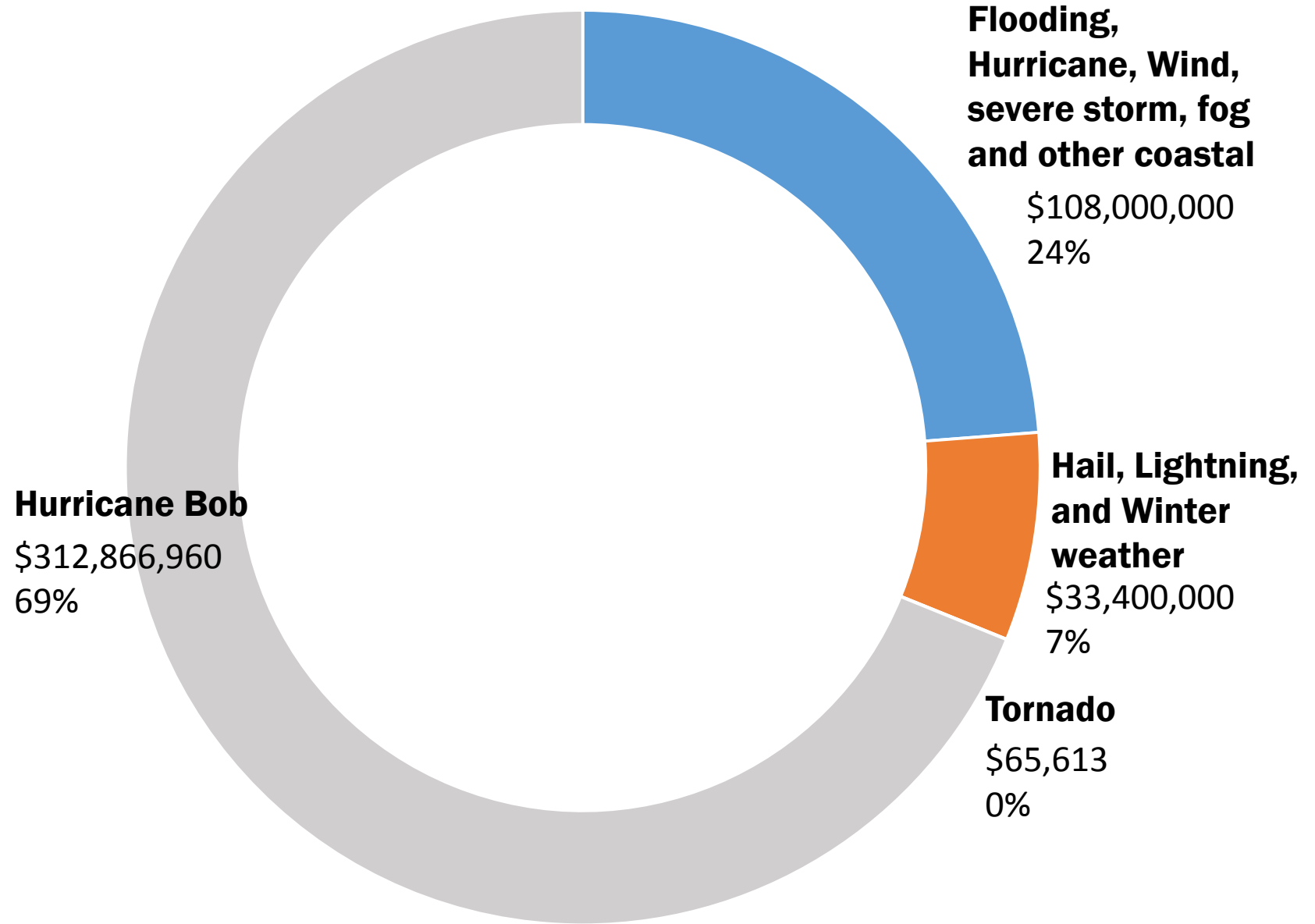


Property Damages from Natural Hazards on the Cape

1960-2014

93%

property damage from coastal hazard on the Cape



Source: SHELDUS, University of South Carolina



13,000

single family homes in
Hazard Areas

\$ 3B

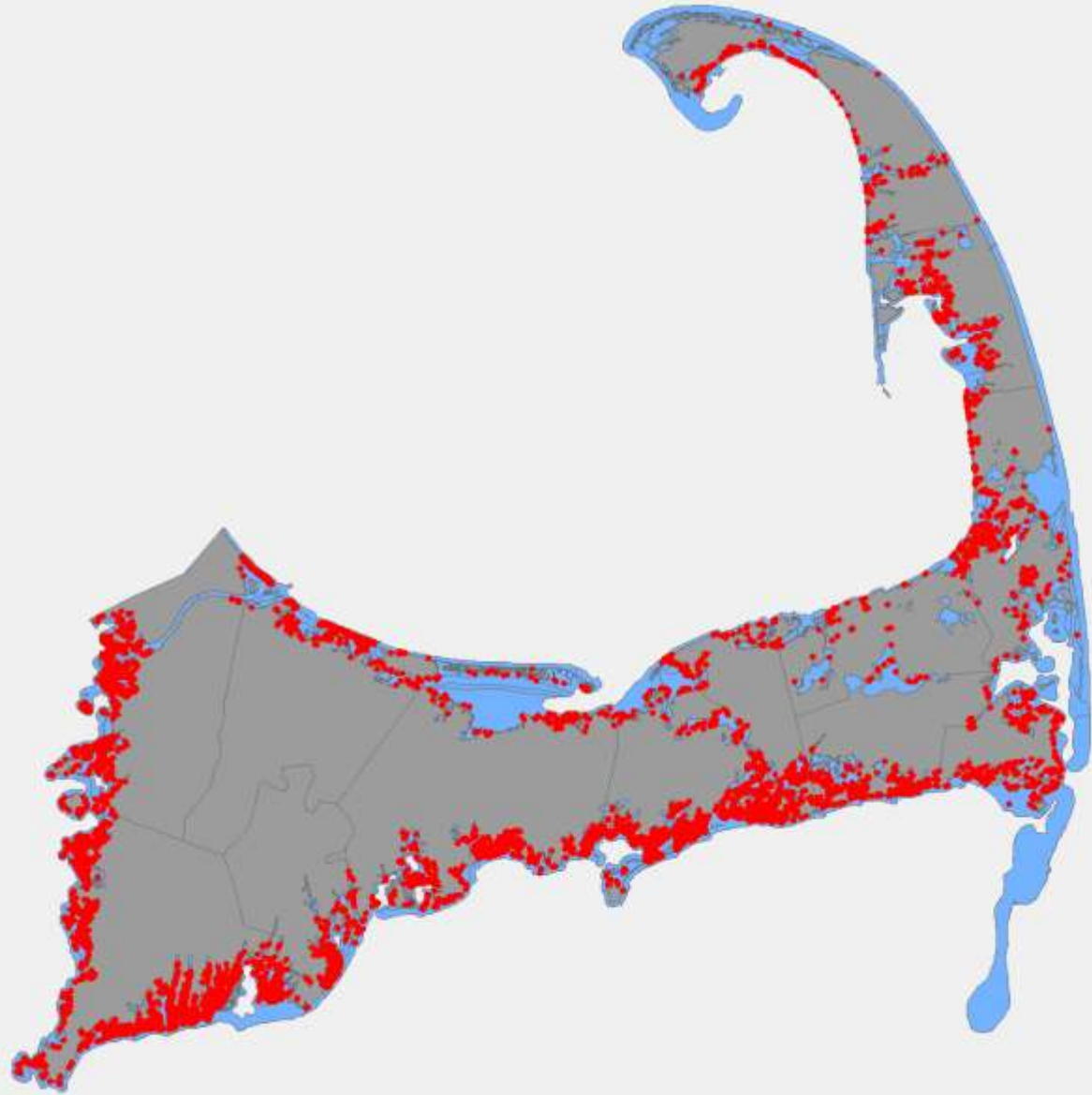
Assessed Building Value
2012

\$ 3B

insured under NFIP

\$ 6B

Land value not
covered
but relevant for
tax base



What can we
do to ensure
long-term
social,
economic and
environmental
viability and
quality?



5

**Things we can
do to make our
communities
more flood
resilient**



1

**Let's protect
our open
spaces**

**A study of 450 communities participating
in FEMA's Community Rating System
found protecting open space reduces
insured losses**

**Insurance cost saved per
community \$591,436**

1

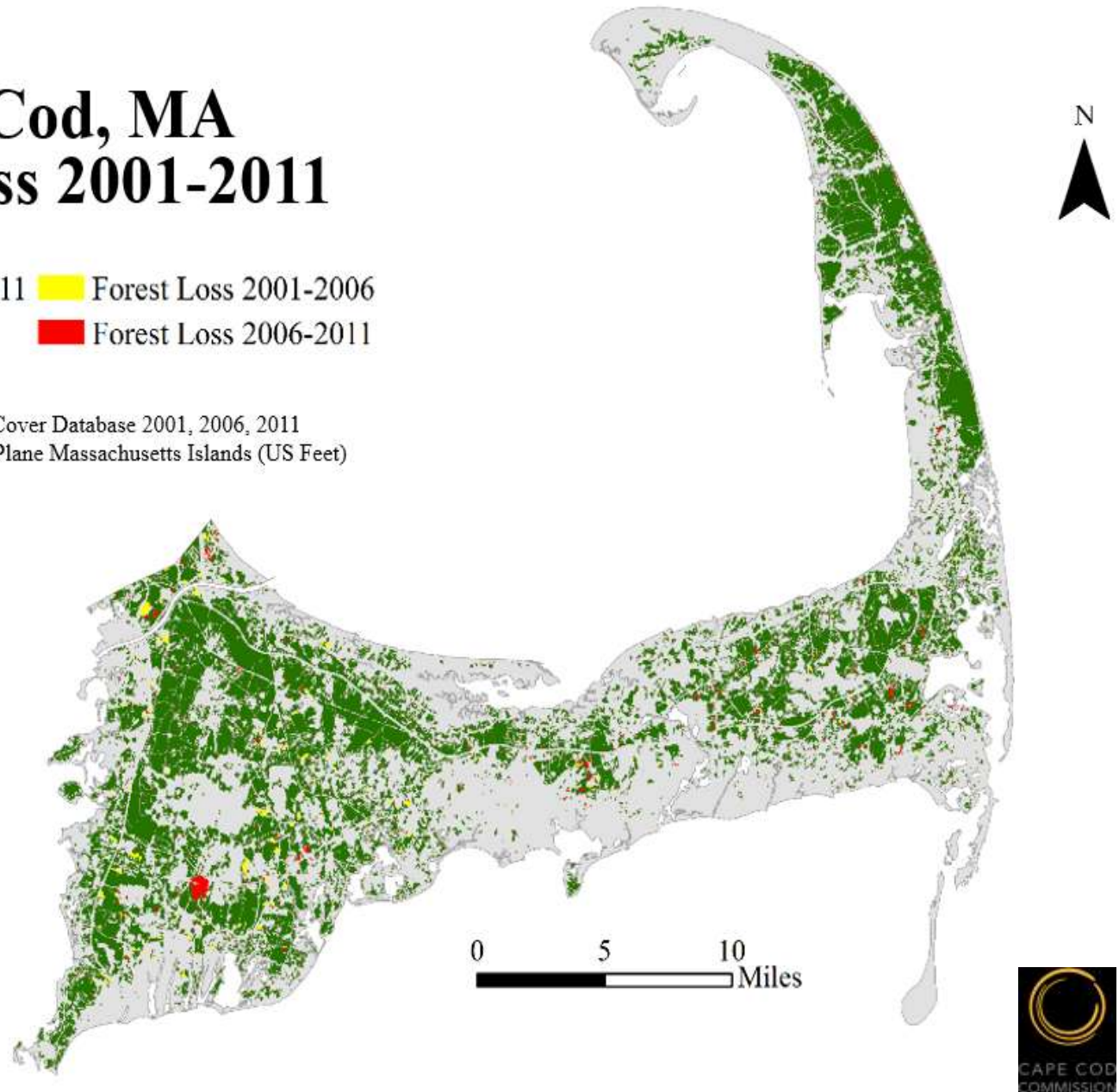
Let's protect
our
open spaces

2,300
Acres
Of forest lost

Cape Cod, MA Forest Loss 2001-2011

■ Remaining Forest, 2011 ■ Forest Loss 2001-2006
■ Non-Forest ■ Forest Loss 2006-2011

Data Source: National Land Cover Database 2001, 2006, 2011
Projection: NAD 1983 State Plane Massachusetts Islands (US Feet)

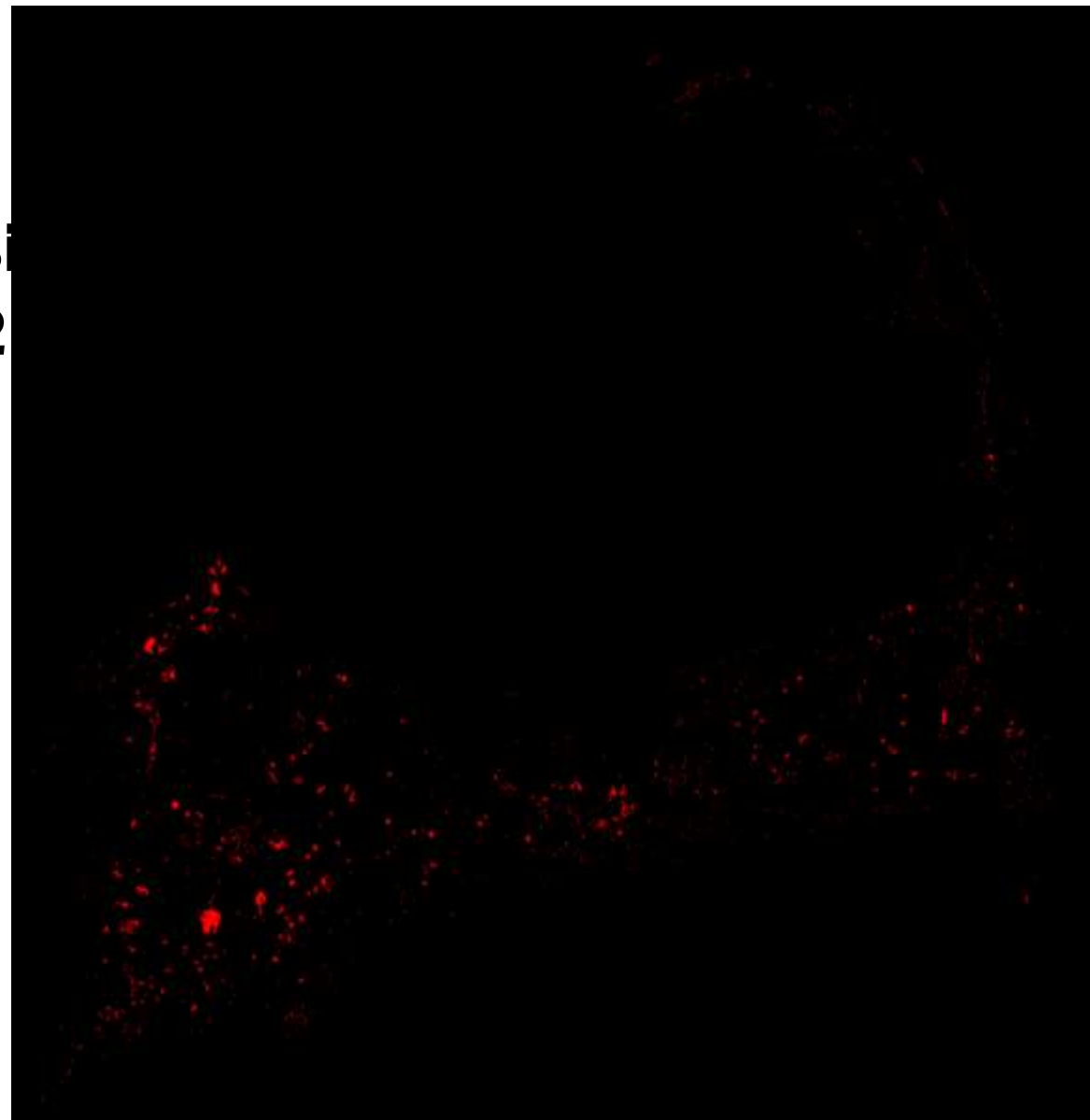


1

**Let's protect
our
open spaces**

**2,300
Acres
Of forest lost**

**Average size
is about 2**



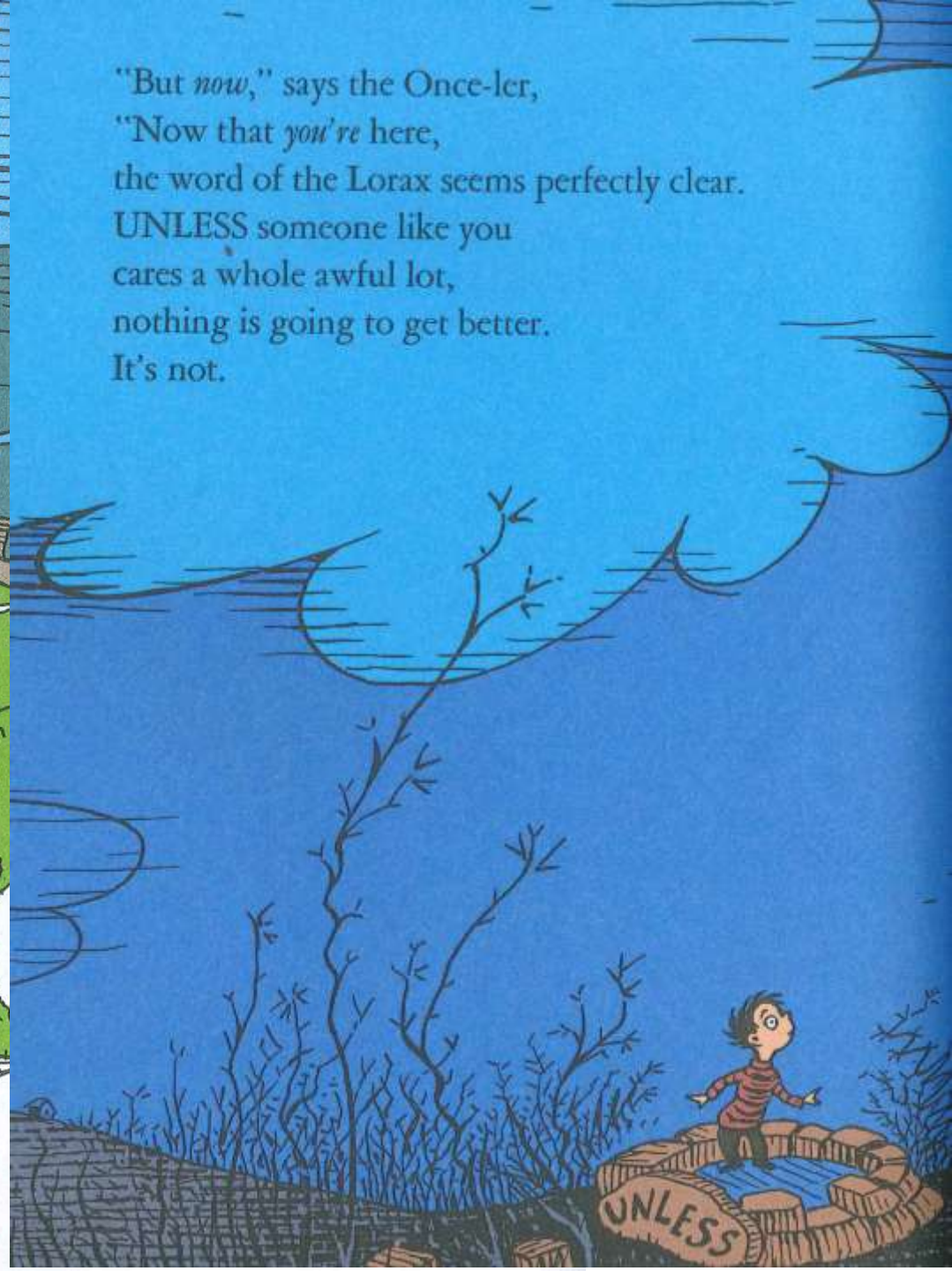
1

Let's protect
our
open spaces

2,300
Acres
Of forest lost



"But *now*," says the Once-ler,
"Now that *you're* here,
the word of the Lorax seems perfectly clear.
UNLESS someone like you
cares a whole awful lot,
nothing is going to get better.
It's not.



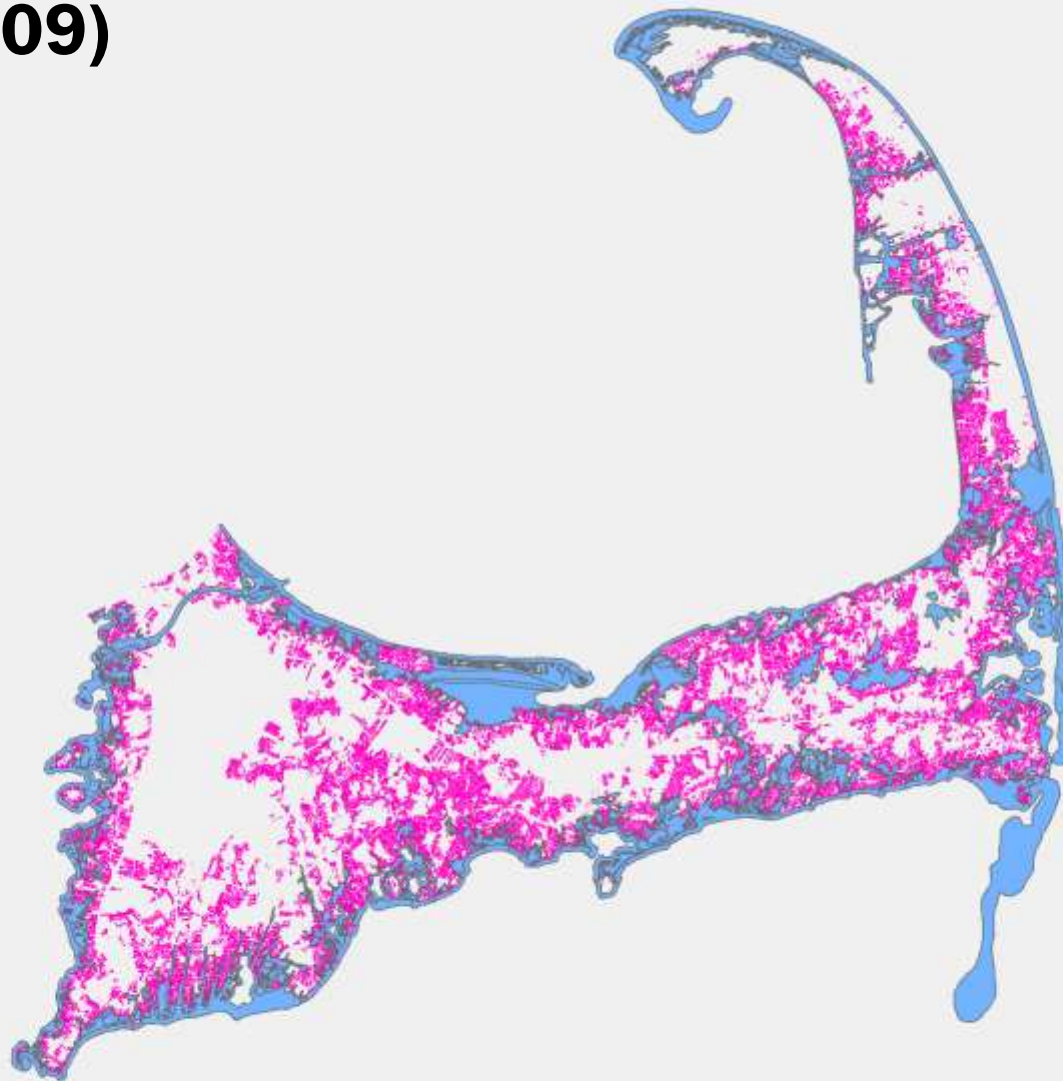
2

**Insure more
homes outside
FEMA's hazard
areas**

\$46B

**Assessed Value
106,500 homes**

**National Claims data shows about 30% of claims
are outside FEMA's Special Flood Hazard Area
(1978-2009)**



3

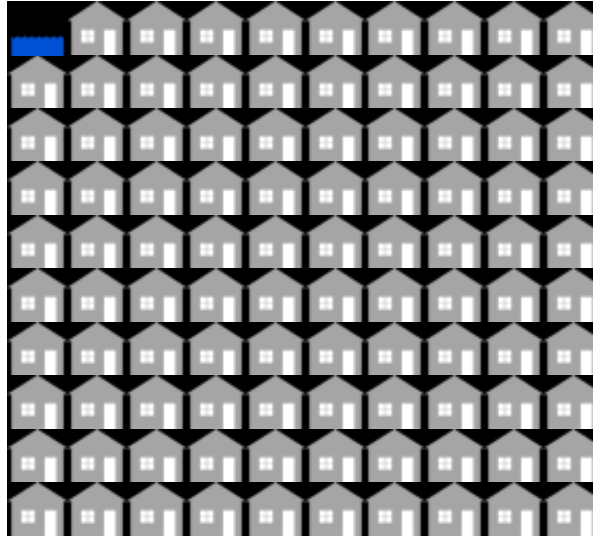
Let's Improve
our
communication
about risk

**“100-year flood”
is about chance,
not time**

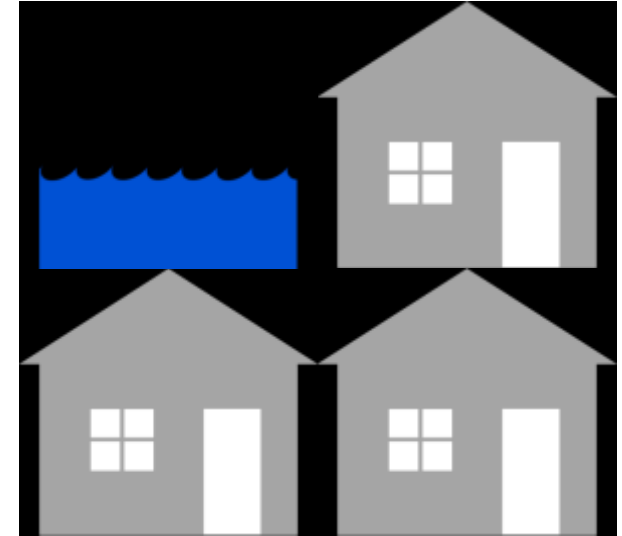
3

**Let's Improve
our
communication
about risk**

**Misnomer of
the 100-year
flood**



**1 in 100
chance
every year**



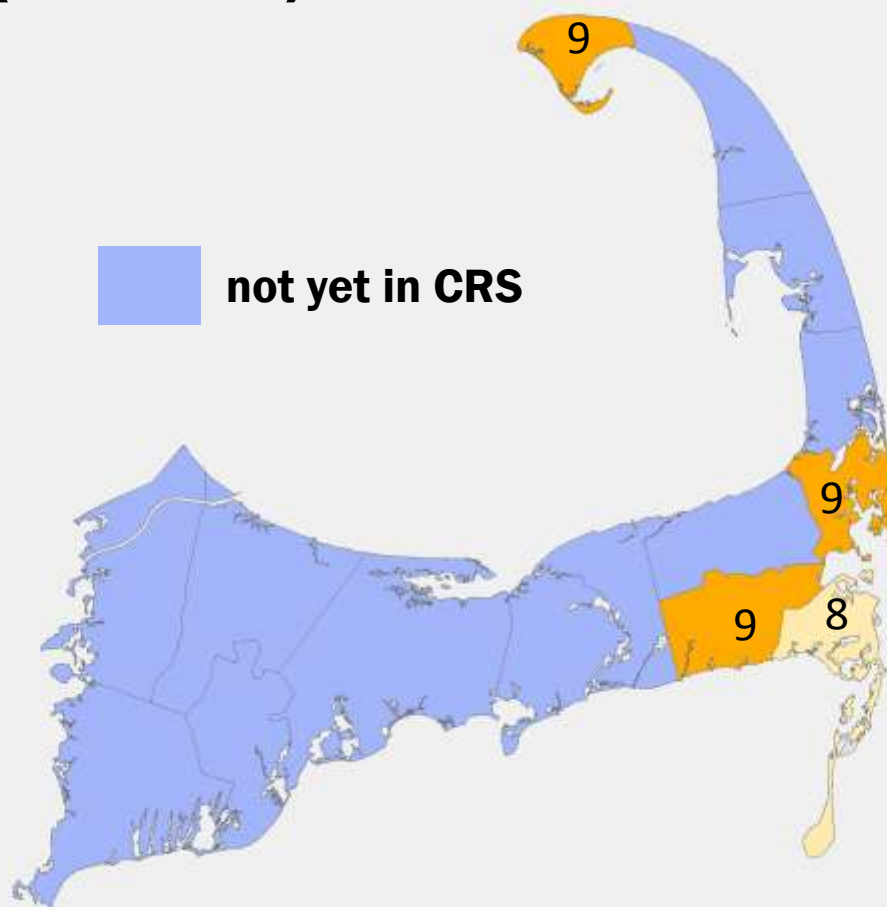
**1 in 4
chance over
30 years**

4

**Increase
participation
under FEMA's
Community
Rating System**

A national study of claims data shows that damage claims from communities with at least basic mitigation efforts (Class 9 and Class 8) are **13.5 % lower than communities with no mitigation efforts (class 10)**

(Kousky and Michel-Kerjan,2015)



5

Let's find
flood-resilient
solutions that
remove excess
nitrogen

We need
holistic
solutions



Allows stakeholders to evaluate
social, **economic** and **environmental**
outcomes of water quality policies
on Cape Cod



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Overview Map

Search by Address

Cape-wide Datalayers

Embayment Watershed(s)

Import Watershed MVP Scenario

Switch Basemap



Plymouth

Barnstable

Falmouth

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