



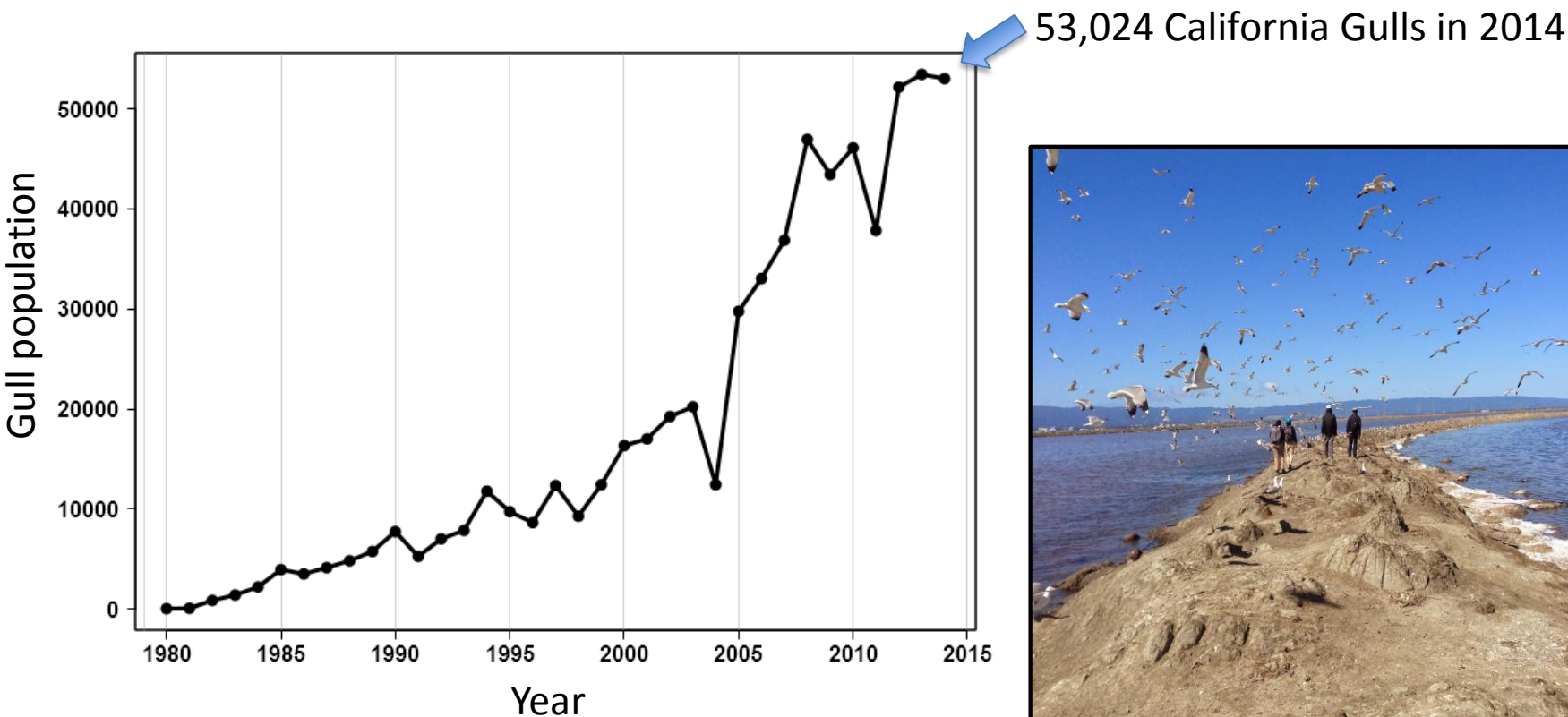
California Gull population growth and response to tidal marsh restoration in South San Francisco Bay

Natalie Washburn, Catherine Burns, Ph.D.,
Erika Taketa and Karine Tokatlian

San Francisco Bay Bird Observatory

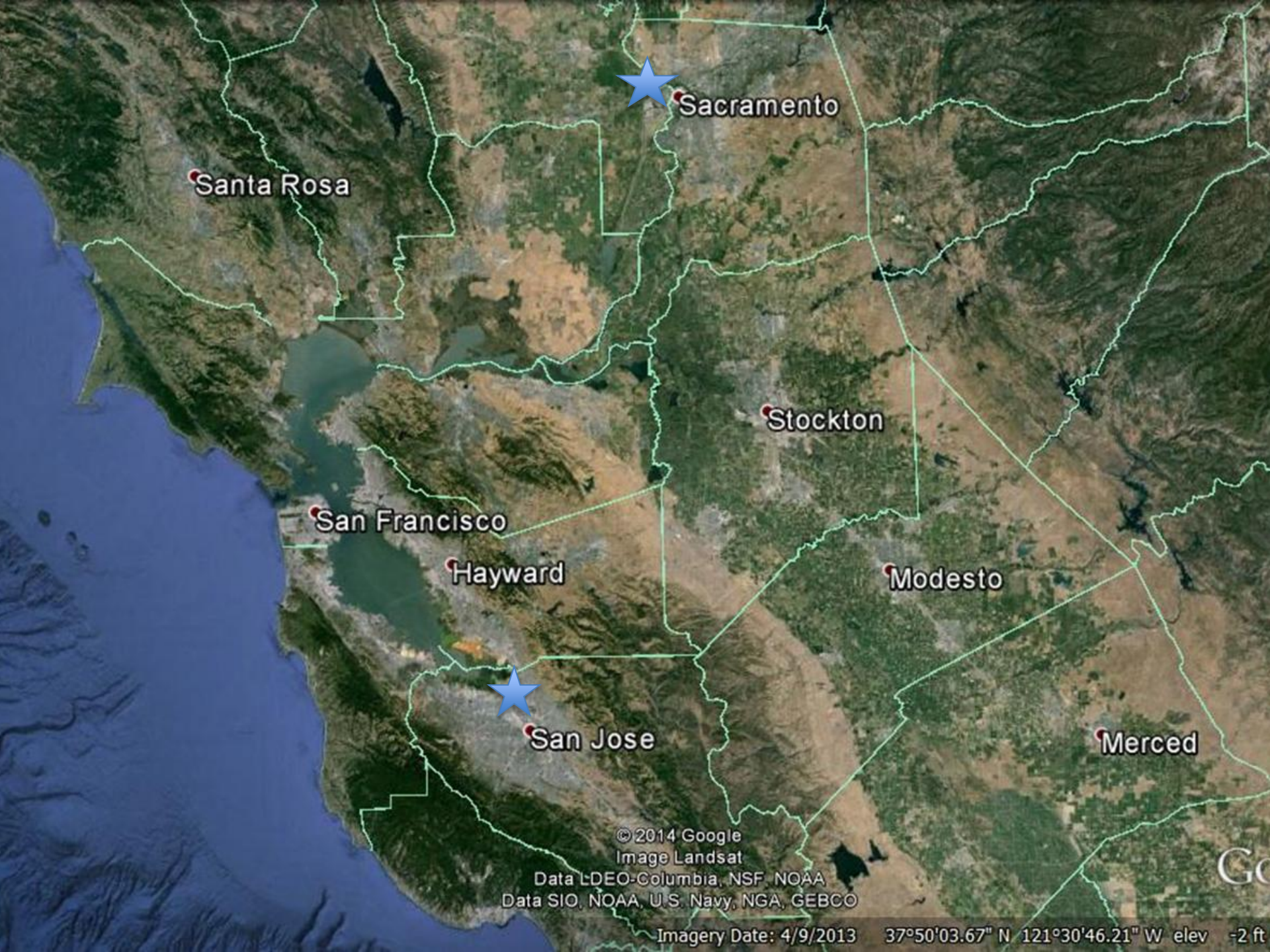


California Gulls from 1980-2014



- Assess changes in California Gull abundance
- Review ecological impacts of gulls
- Gull response to 2010 tidal restoration





Santa Rosa

★ Sacramento

Stockton

San Francisco

Hayward

Modesto

★ San Jose

Merced

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Image Landsat
Data LDEO-Columbia, NSF, NOAA
Data SIO, NOAA, U.S. Navy, NGA, GEBCO

Imagery Date: 4/9/2013 37°50'03.67" N 121°30'46.21" W elev -2 ft



South Bay Salt Pond Restoration Project

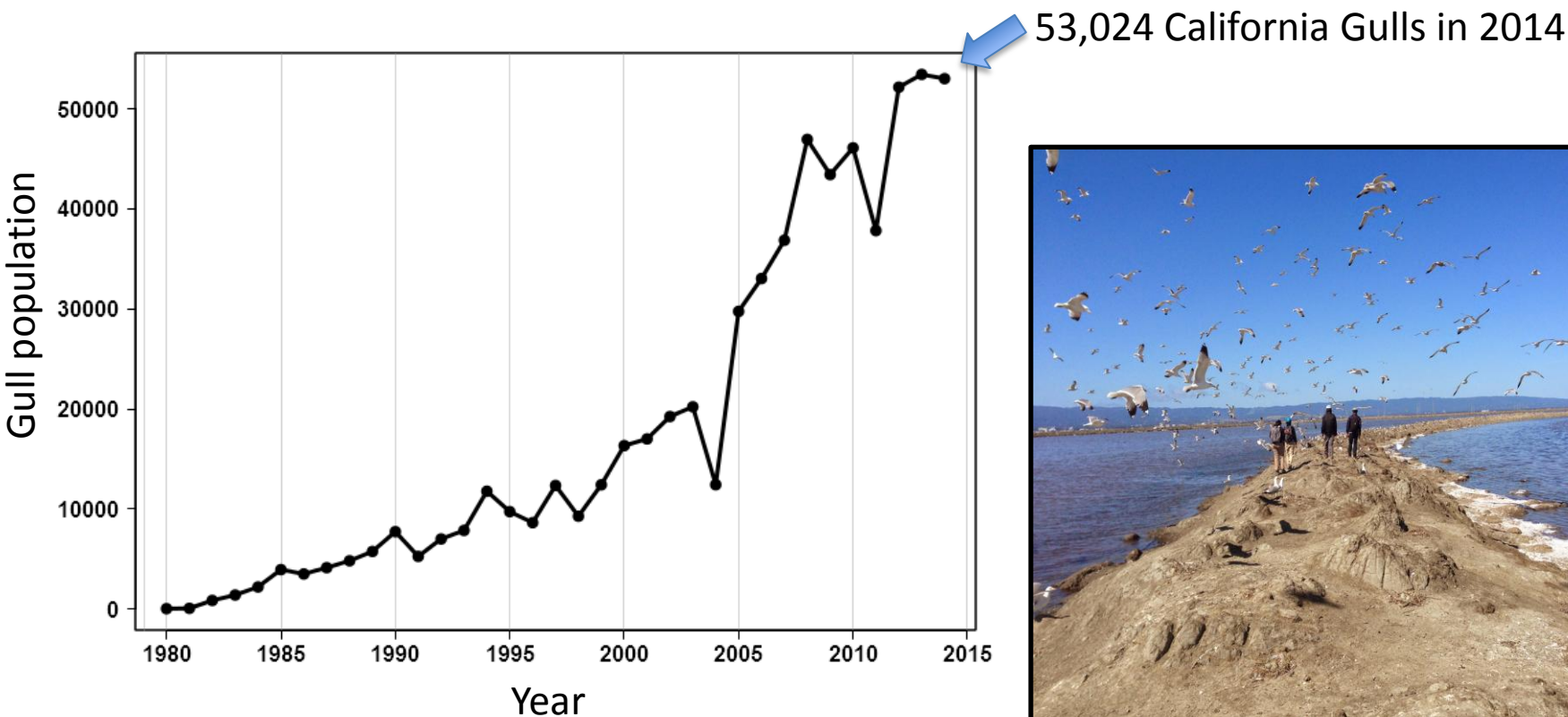
- Largest tidal wetland restoration project on the West Coast
- Land purchased in 2003 from Cargill Salt
- To restore over 15,000 acres of salt pond to wetland habitats



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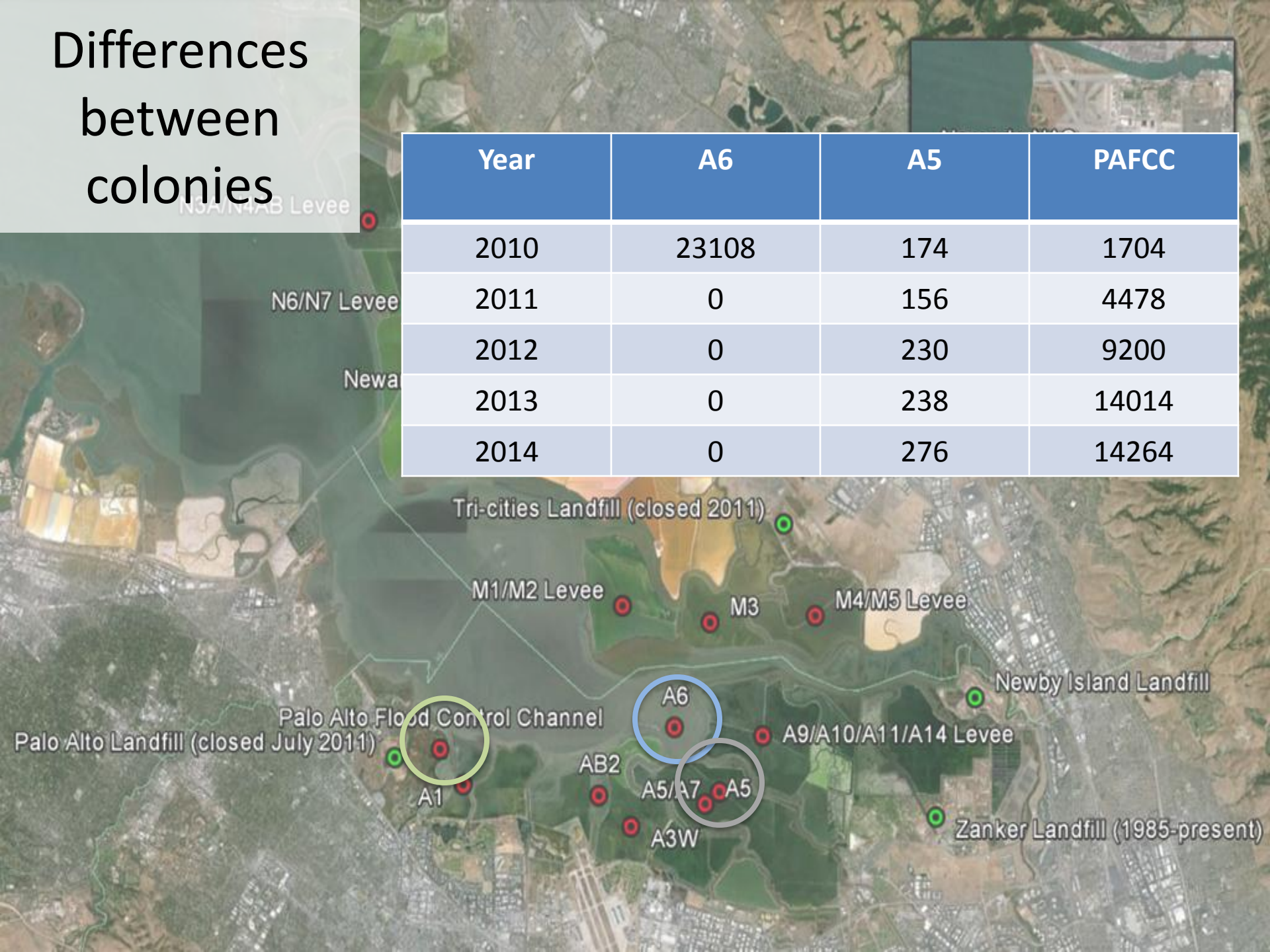


- 15 colonies in South Bay since 1980, 10 still active today
- SFBBO has been surveying these colonies since 1980
- Largest colony (through 2010) was at A6 – over 23,000



Differences between colonies

Year	A6	A5	PAFCC
2010	23108	174	1704
2011	0	156	4478
2012	0	230	9200
2013	0	238	14014
2014	0	276	14264



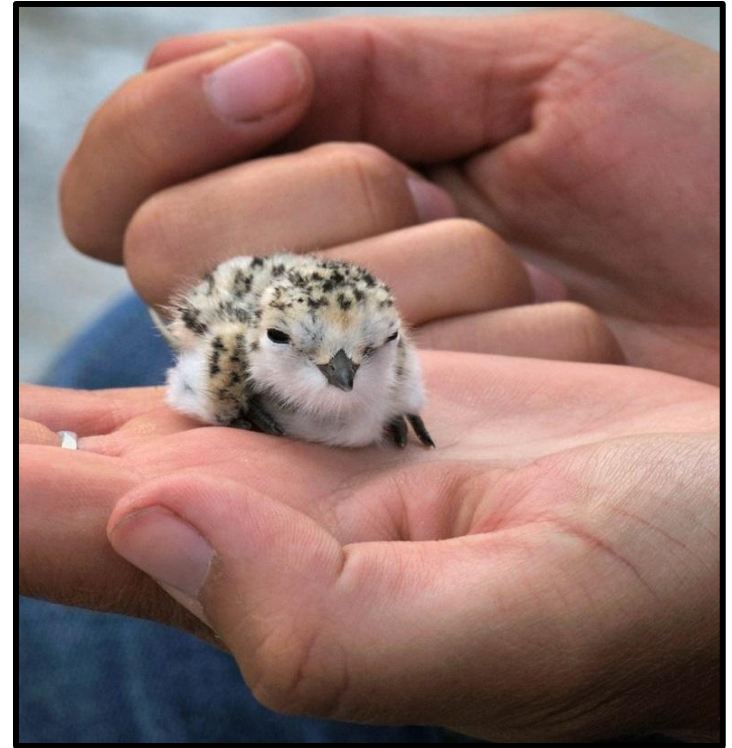
Why such a dramatic increase in gull numbers?



- Emigration? Little evidence for this
- Food availability? Increased access to food at landfills and elsewhere a likely factor
- Climate – Pacific Decadal Oscillation; ENSO; sea surface temperatures
- Further research needed, particularly on gull nest success



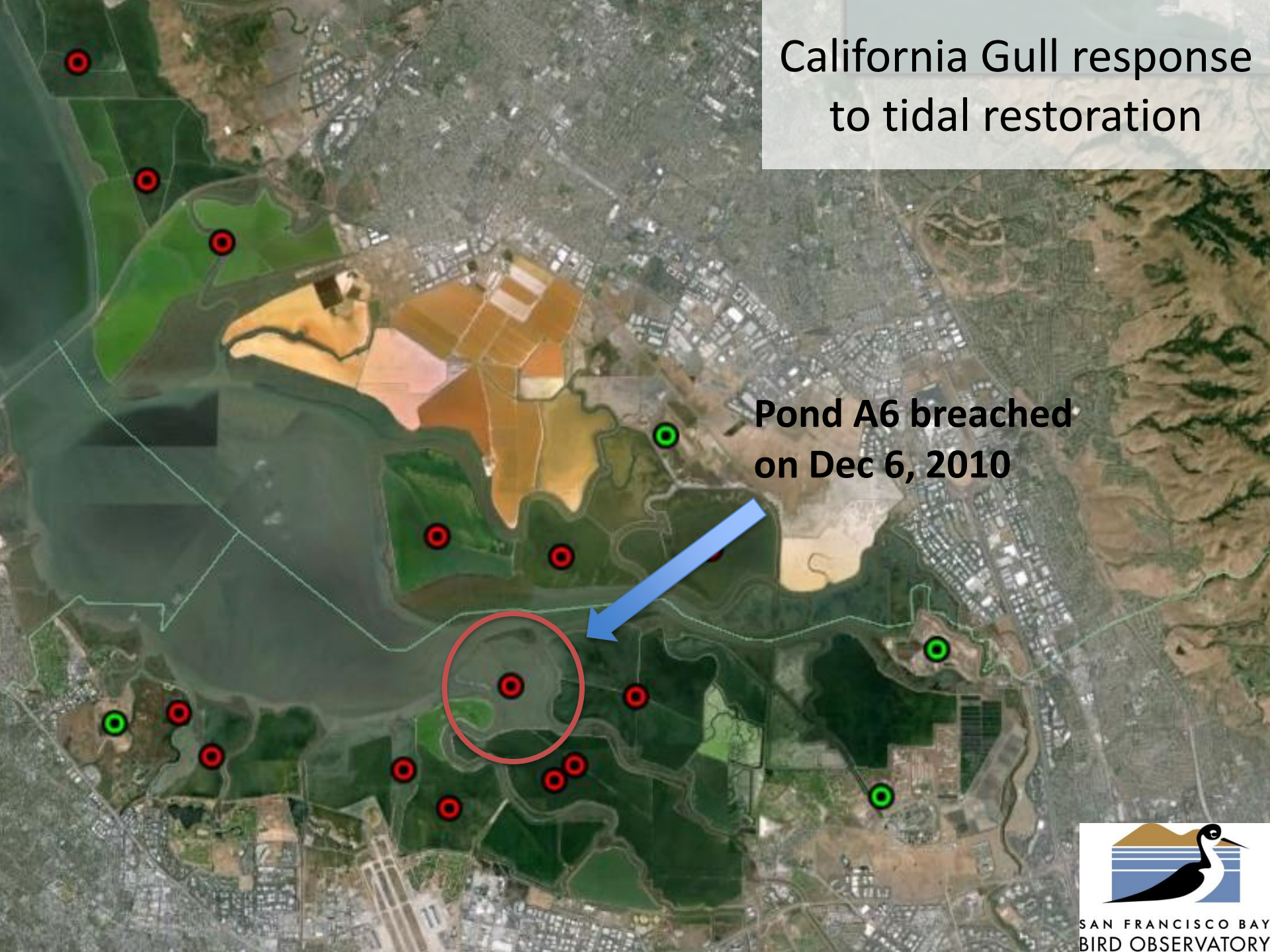
What does this mean for other bird species?



- Studies by SFBBO and others show negative ecological impacts of gulls through nest and chick predation and colony encroachment
- Higher gull numbers likely mean lower survival and reproduction for species like the Forster's Tern, American Avocet, Western Snowy Plover

California Gull response to tidal restoration

**Pond A6 breached
on Dec 6, 2010**



California Gull response to tidal restoration

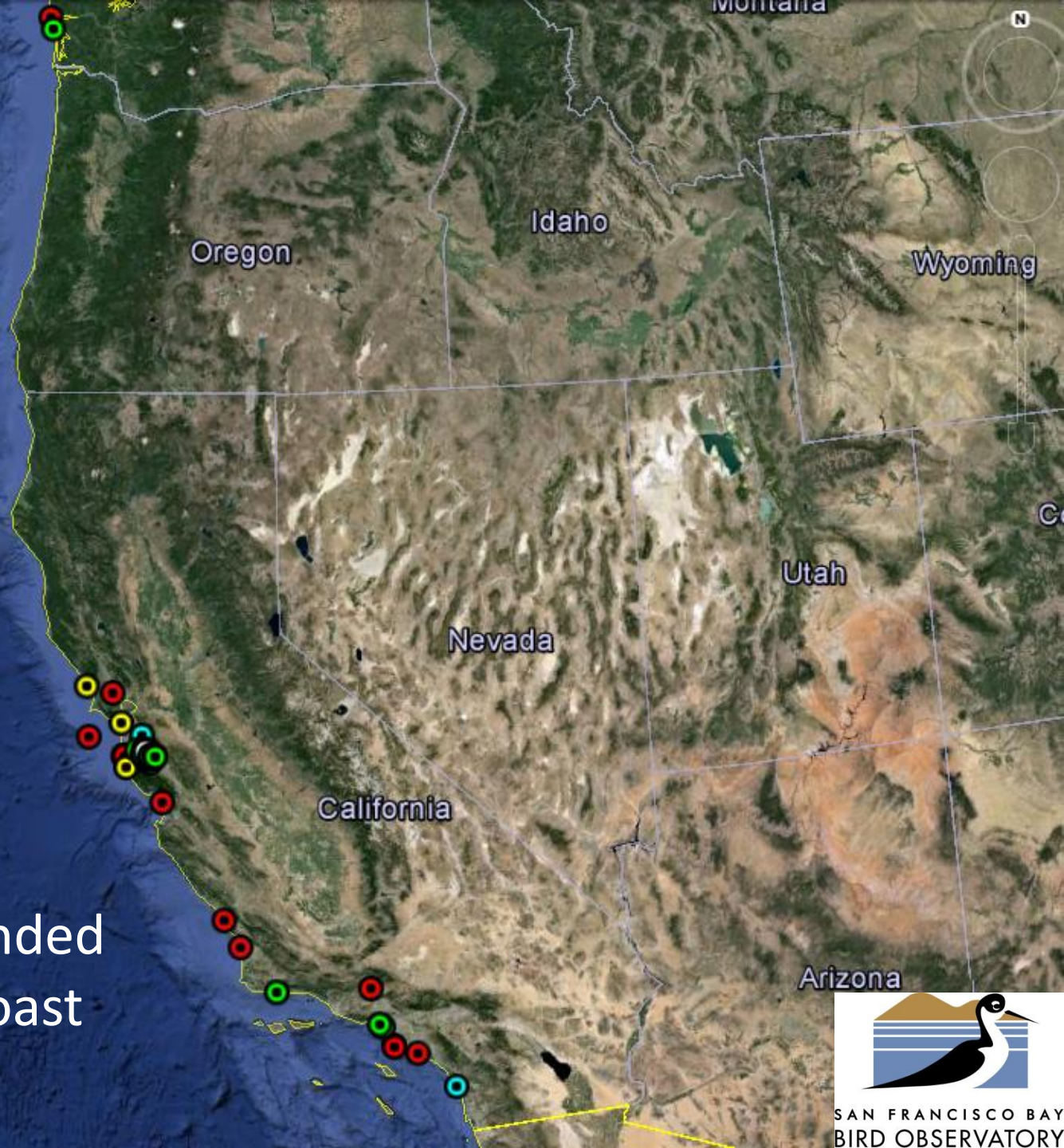
- SFBBO banded gulls at pond A6 prior to the restoration
- Conducted resight surveys to determine movements following restoration
- 1307 banded gulls sighted at A6 from 2008-2010
- Assessed resight data through 2013
- 134 banded gulls seen after breach (169 sightings) at 50 locations



Photo: K. Vylet

- 2011
- 2011-12
- 2012
- 2012-13
- 2013
- 2011-2013

Resightings of banded A6 gulls: West Coast



Resightings of banded A6 gulls: South Bay

- 2011
- 2011-12
- 2012
- 2012-13
- 2013
- 2011-2013

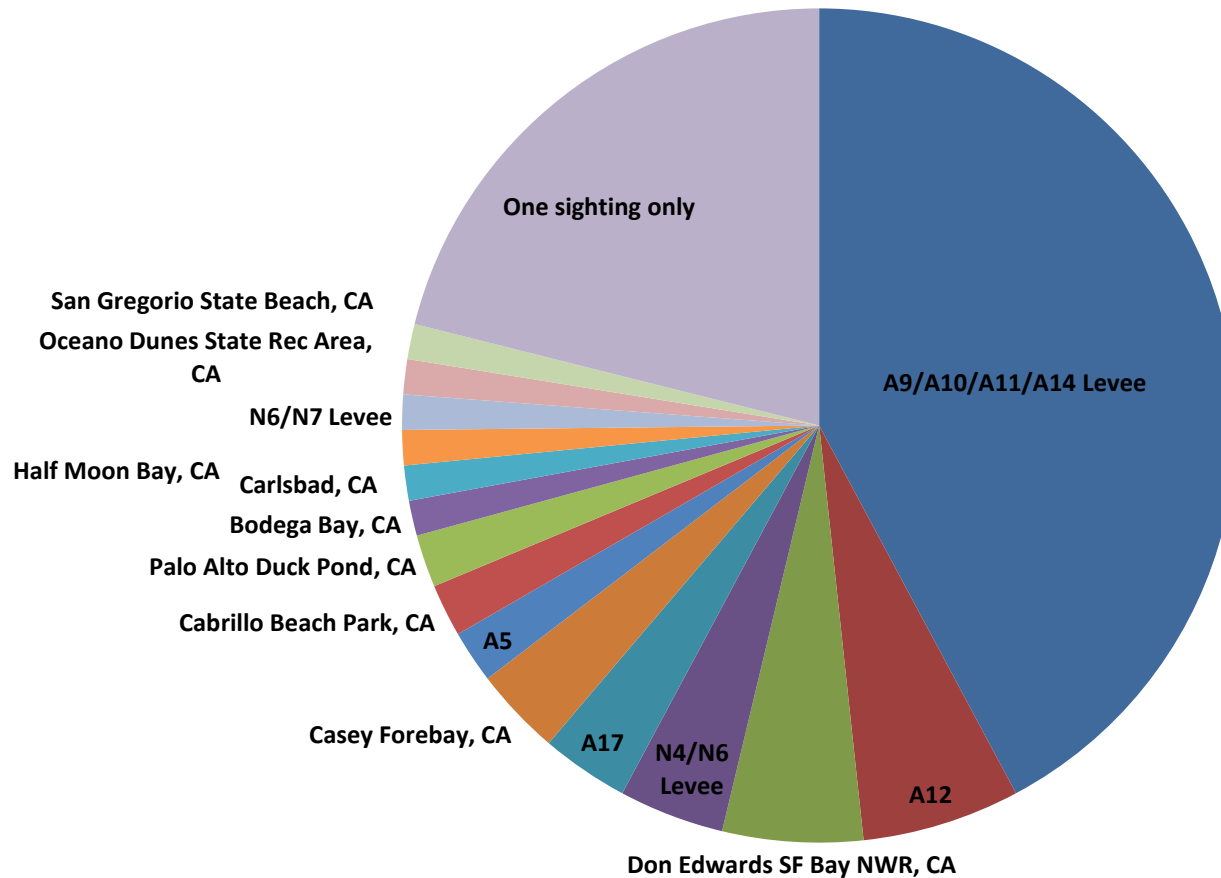


Image Landsat
Image © 2013 DigitalGlobe

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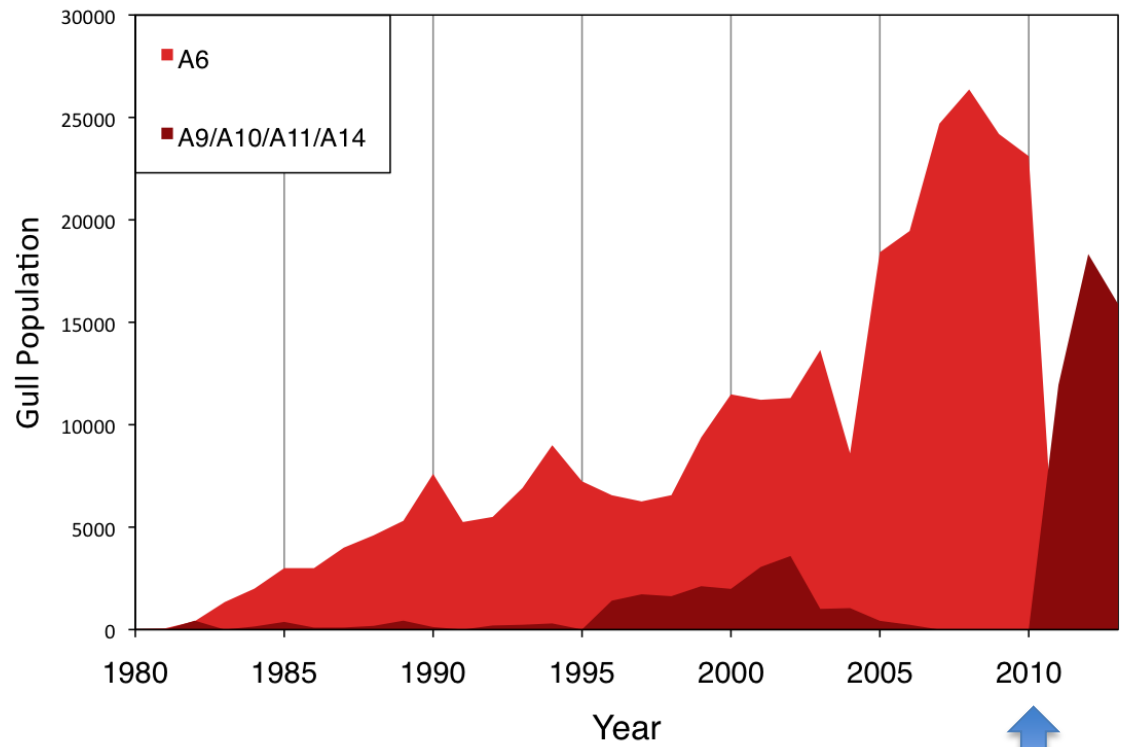
Google earth

Number of CAGU Resights by Location (2011-2013)

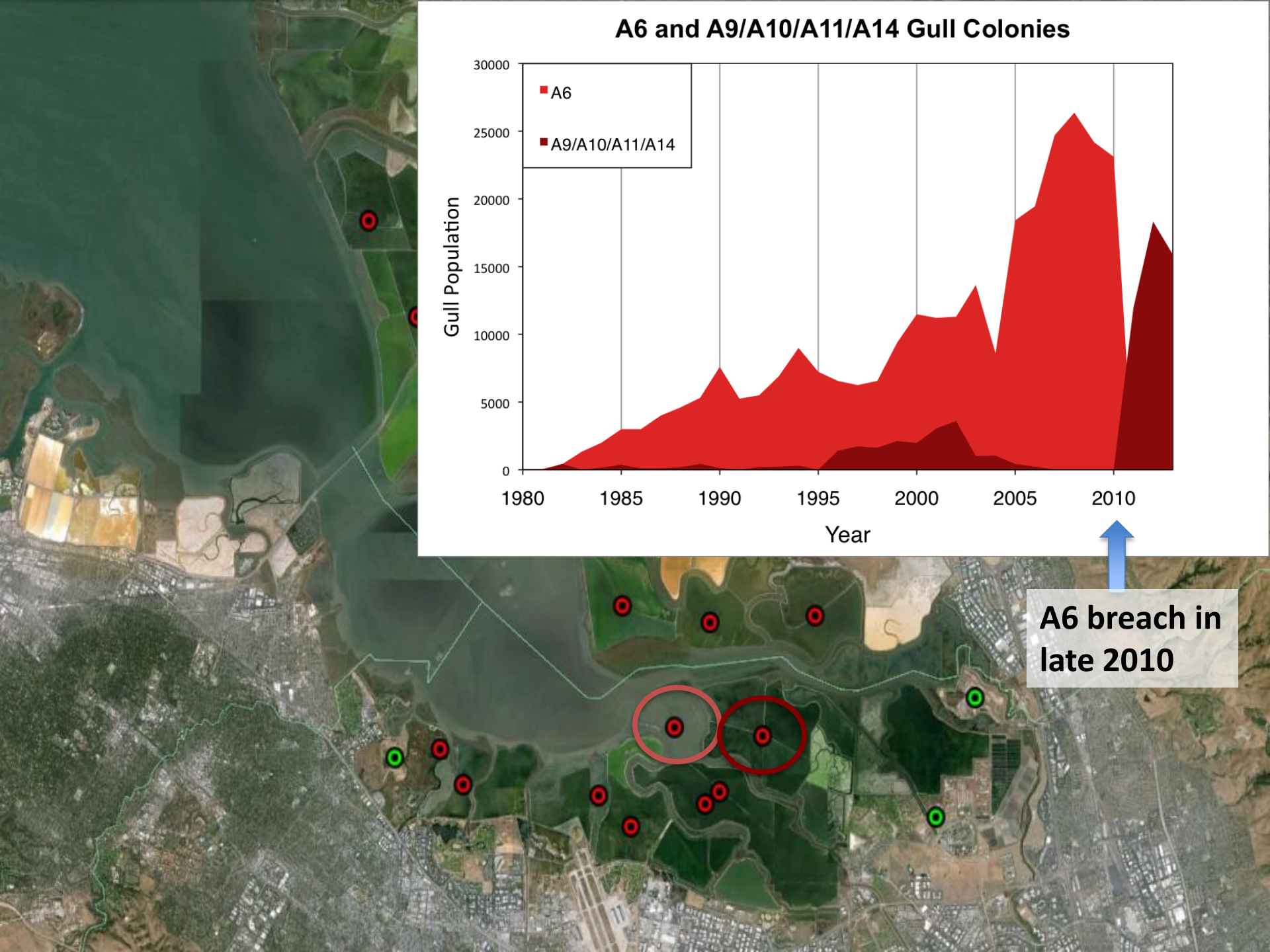


- Many gulls were resighted at adjacent colonies (62 sightings, 42%)
- Most other locations had 1-2 sightings

A6 and A9/A10/A11/A14 Gull Colonies



A6 breach in late 2010



Summary

- South San Francisco Bay gull population has **increased rapidly** over the past three decades
- **Colony growth varies** but most are growing quickly
- **A6 tidal restoration displaced the largest colony in 2010**, but most moved to an adjacent colony
- Further research needed to assess **gull nest success** in South SF Bay



Acknowledgements



- SFBBO donors, who have financially supported this work since 1980; Resources Legacy Fund
- SFBBO staff members, volunteers and student interns who conducted the surveys
- Partners at SBSRP, USFWS, USGS, CDFW and many other landowners and managers

