

The History and Current Status of the California Red Sea Urchin Fishery



Marine Resources Committee-June 18th, 2013
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California Department of Fish and Wildlife
Marine Region, Invertebrate Project

Photo courtesy of National Geographic

Presentation Overview

Sea Urchin Life History

Description of the Fishery

Historical Landings, Value, and Permits

Spatial Catch Patterns

Long-Term Sustainability

Diver Age Structure

Common California Sea Urchins



Red

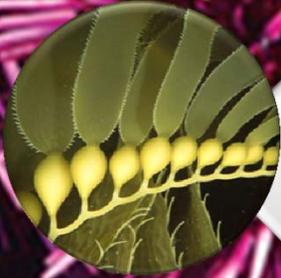
*Strongylocentrotus
franciscanus*

Purple

*Strongylocentrotus
purpuratus*

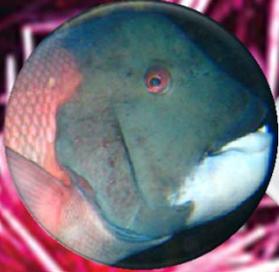
Coronado

*Centrostephanus
coronatus*



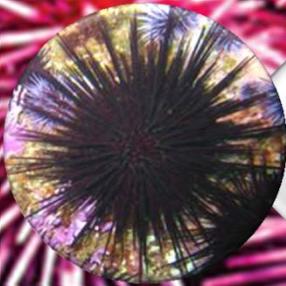
Habitat and Food

Occur low intertidal to 300 feet, coast wide rocky habitat from Alaska to Baja Mexico, feed on kelp, can create barren and eating fronts



Predators

Sea otters, CA sheephead, lobster, stars, crabs



Growth and Longevity

Red urchin growth varies (3.5 in. in 6-8 yrs.), very long-lived



Reproduction

Red urchin sexually mature at 2 in., sexes separate, spawning seasonal, external fertilization, millions of eggs per female

Photo Credit: CSUC



Photo Credit: Jim Cooluris

Fishing Method

- Use hookah or SCUBA
- Live product, price is quality dependent
- Clean fishery, no by-catch



Regulations

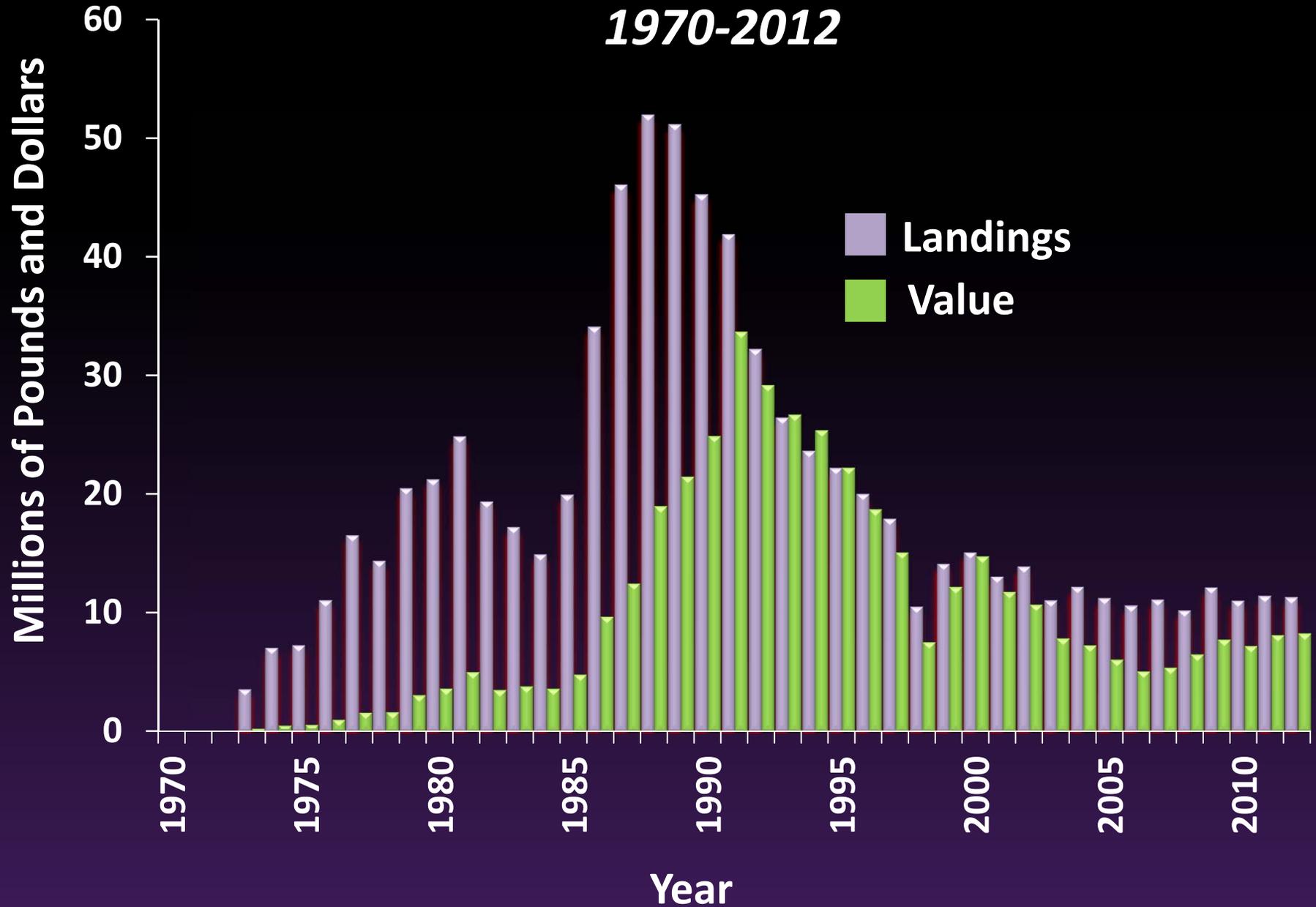
- Restricted access permit, non-transferable
- Size restrictions: 3.25" South, 3.5" North
- Open Season (Nov-June; 7 days)(June-Oct; M,T,W,Th)
- No bag limit, daily logbook required

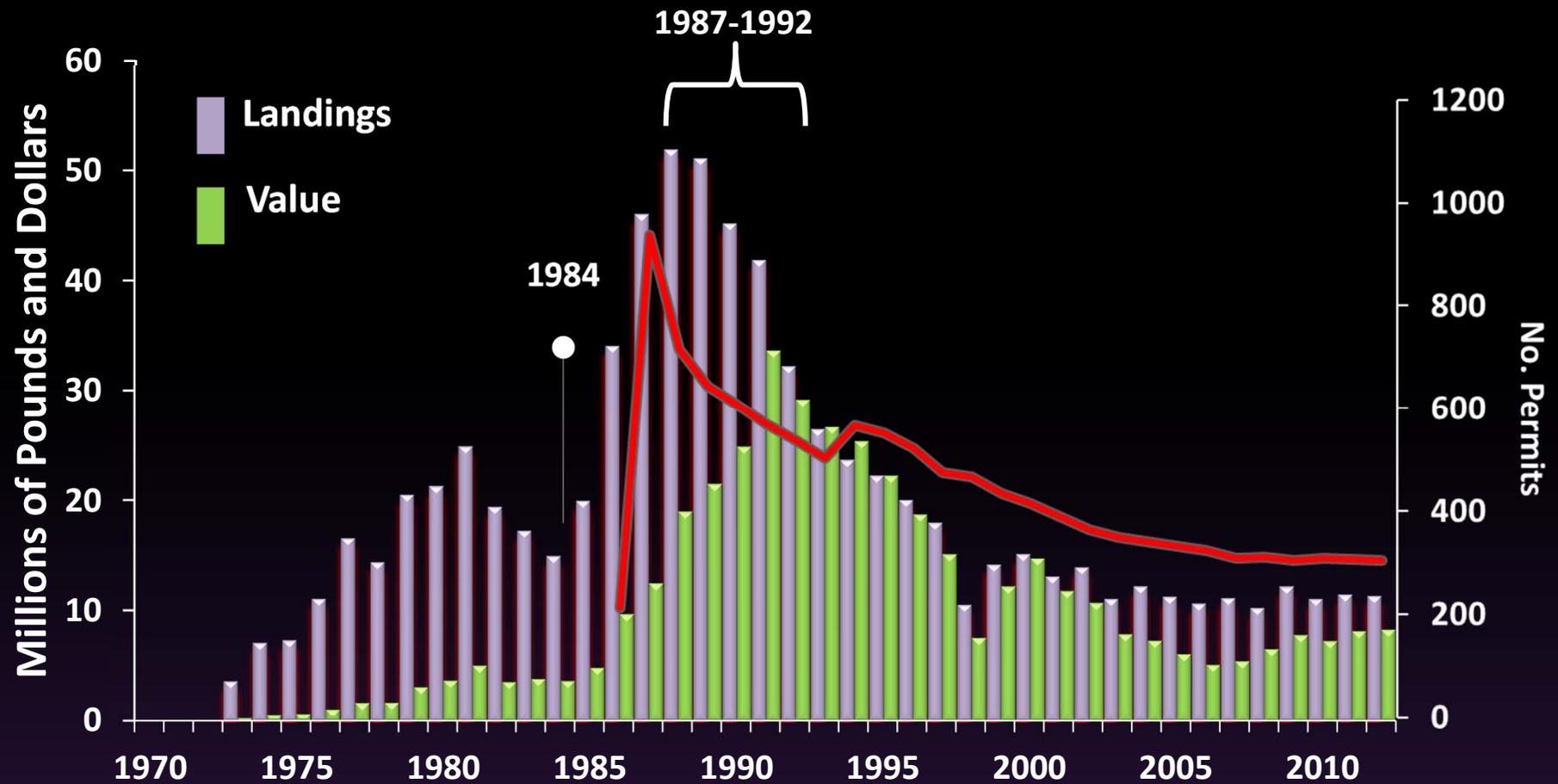


Product

- Sold live; shipped live or processed
- Gonads of male and female marketed as "uni"
- Male and female gonads look similar
- Domestic and international markets
- Changed to more domestic in early 2000s

Historical State Landings and Value 1970-2012



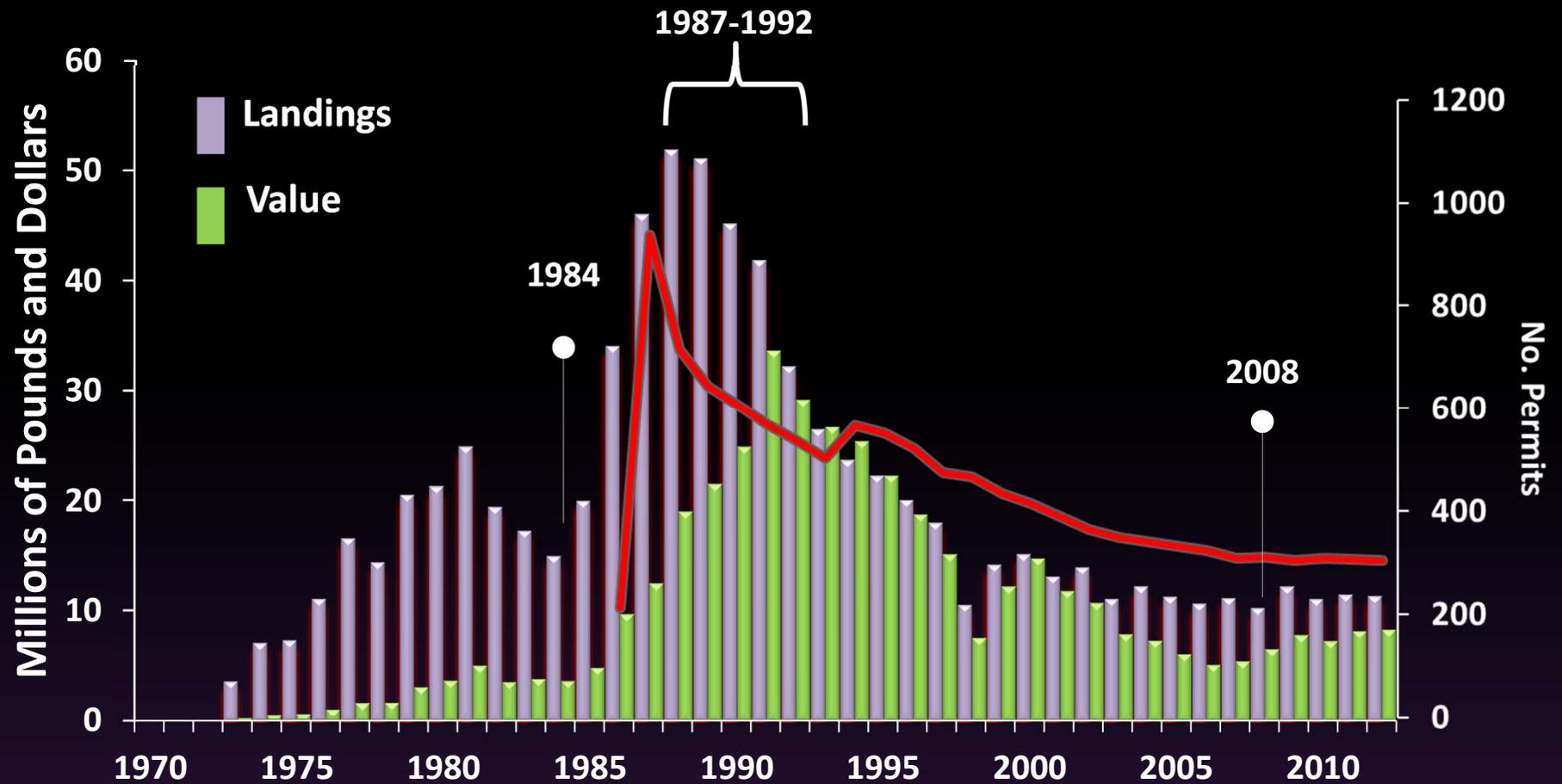


1984 permit required

1987 FGC places moratorium on new permits

1988 Minimum legal size limit (increased N. CA 1990 and increased in S. CA 1992)

1989 Restricted access program begins



1990 Effort Reducing Scheme 10:1 Lottery

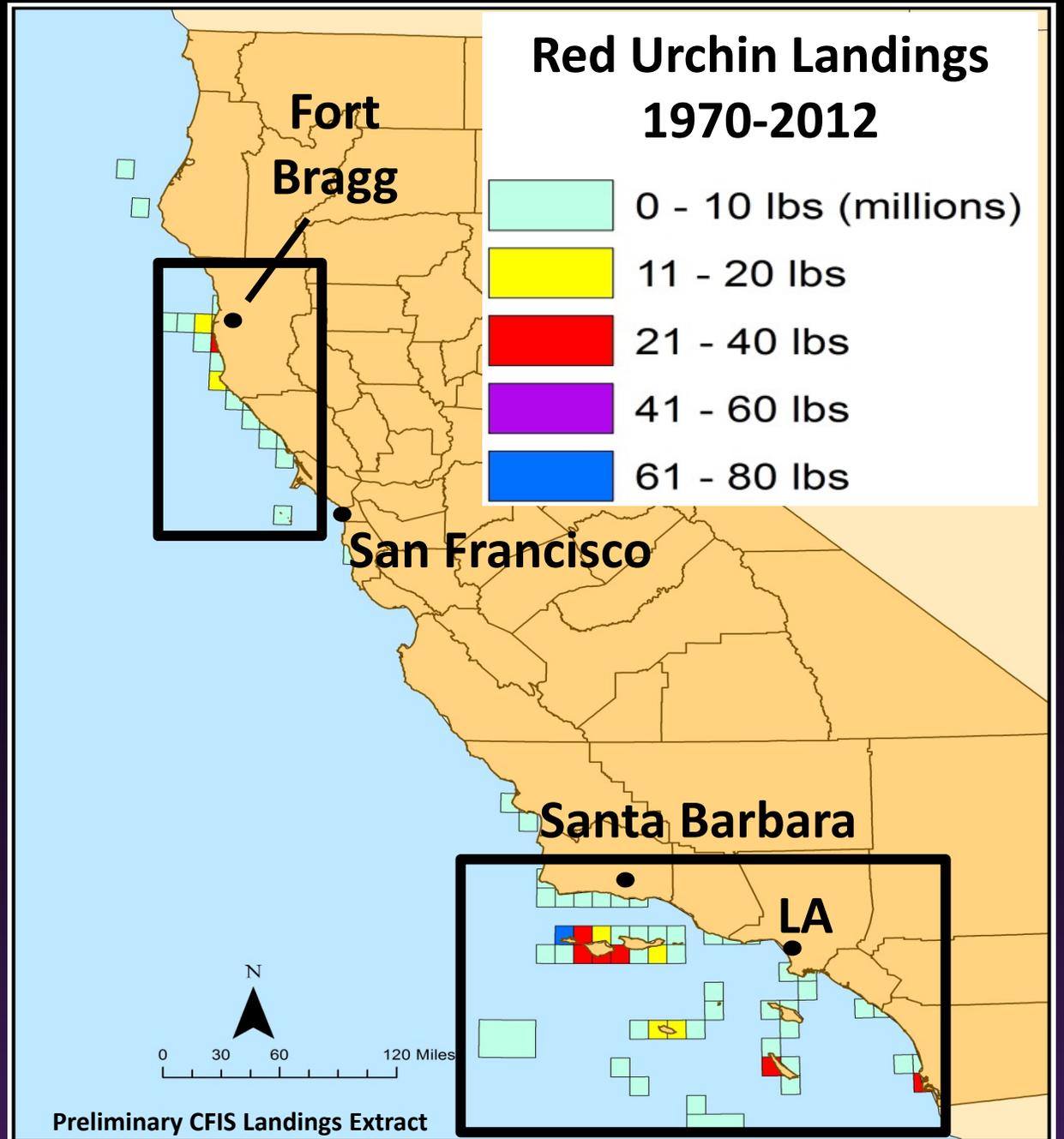
1990 N. CA Restricted Season (233 days)

1992 S. CA Restricted Season (240 days)

2008 Increased Fishing Days Statewide (about 300 days)

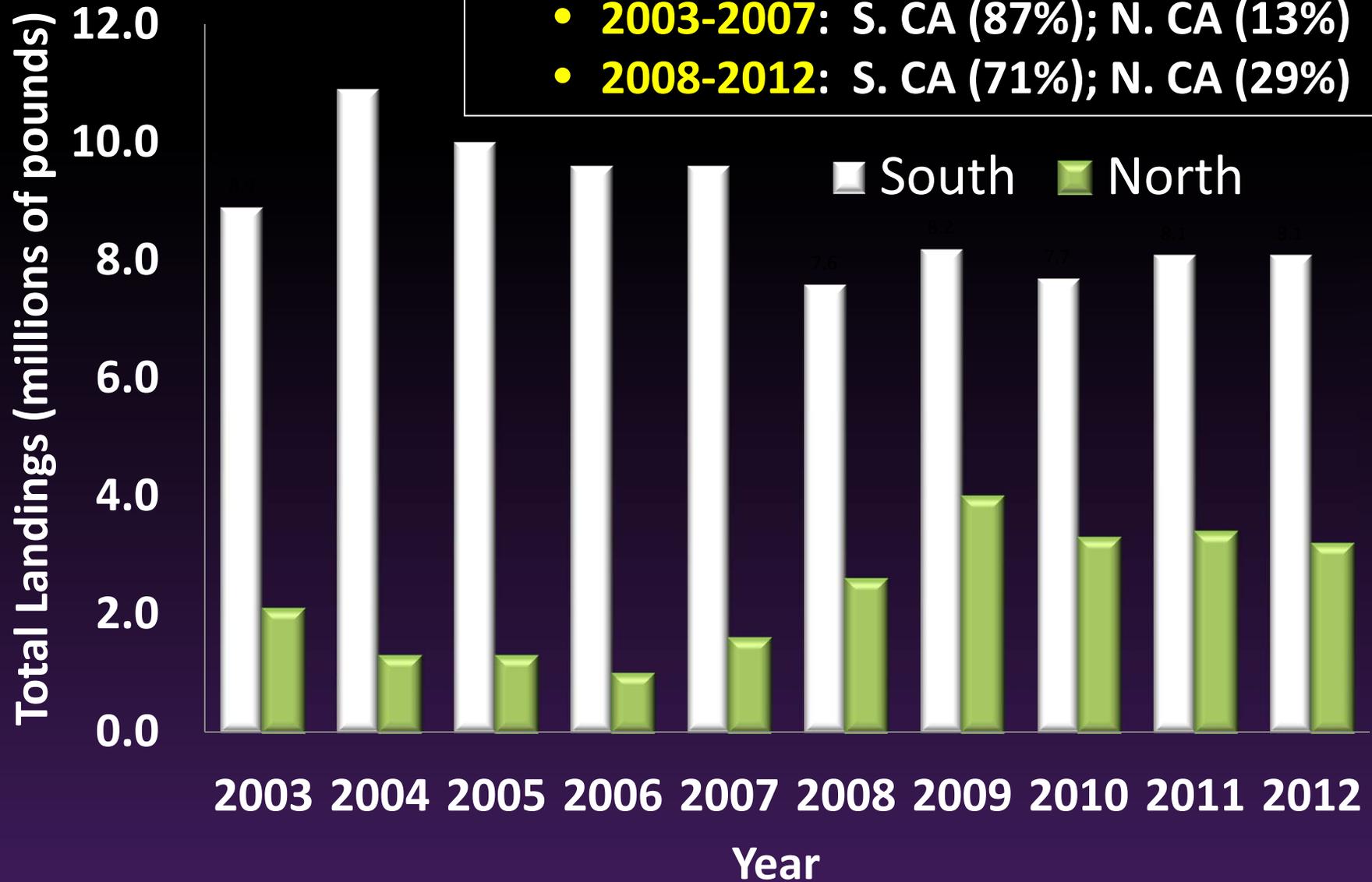
Statewide Landings Throughout History

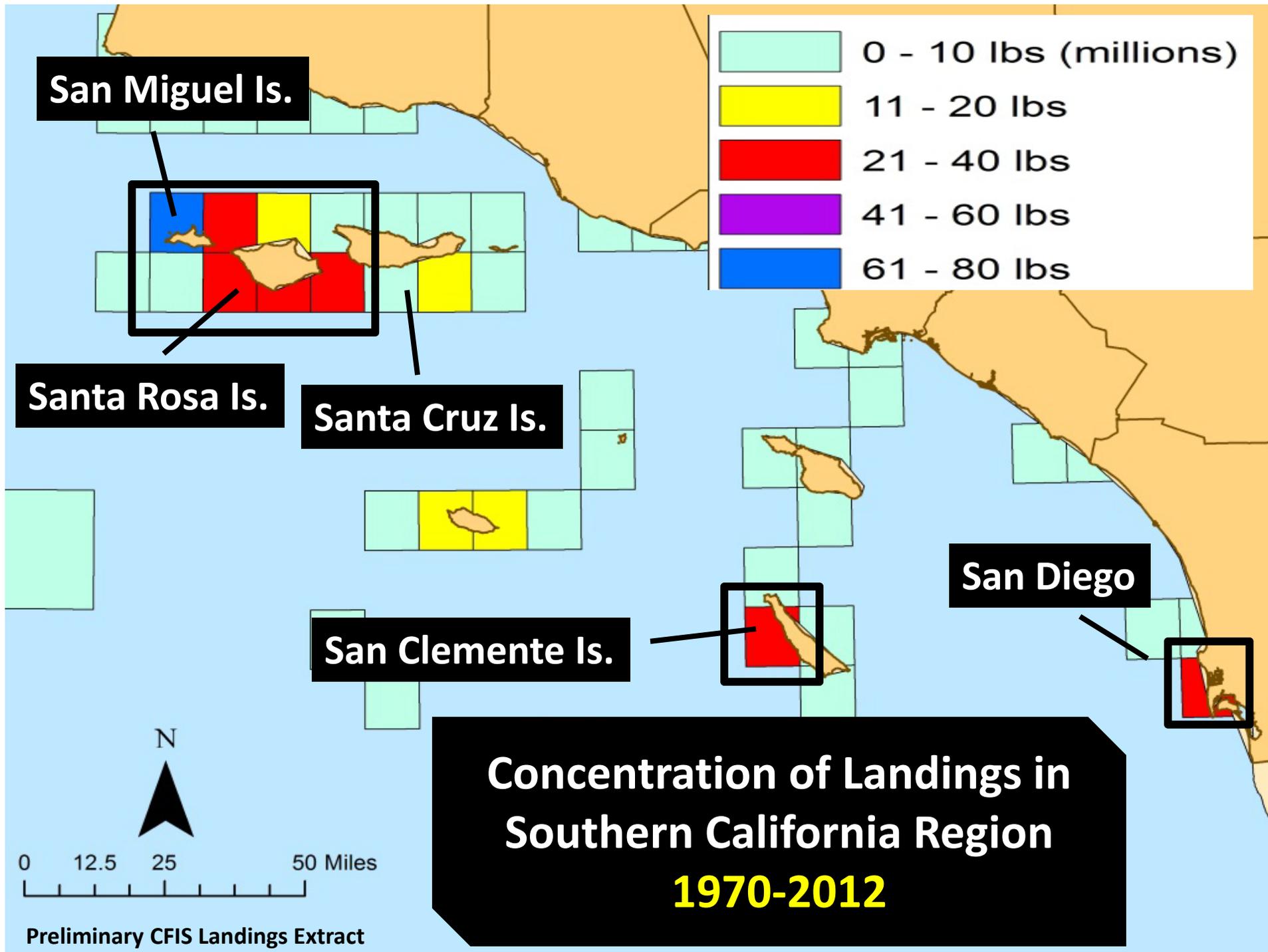
- Concentrated Effort Fort Bragg Vicinity and Southern California Region
- Majority of N. CA Landings near Fort Bragg
- Majority of S. CA Landings at offshore islands and San Diego



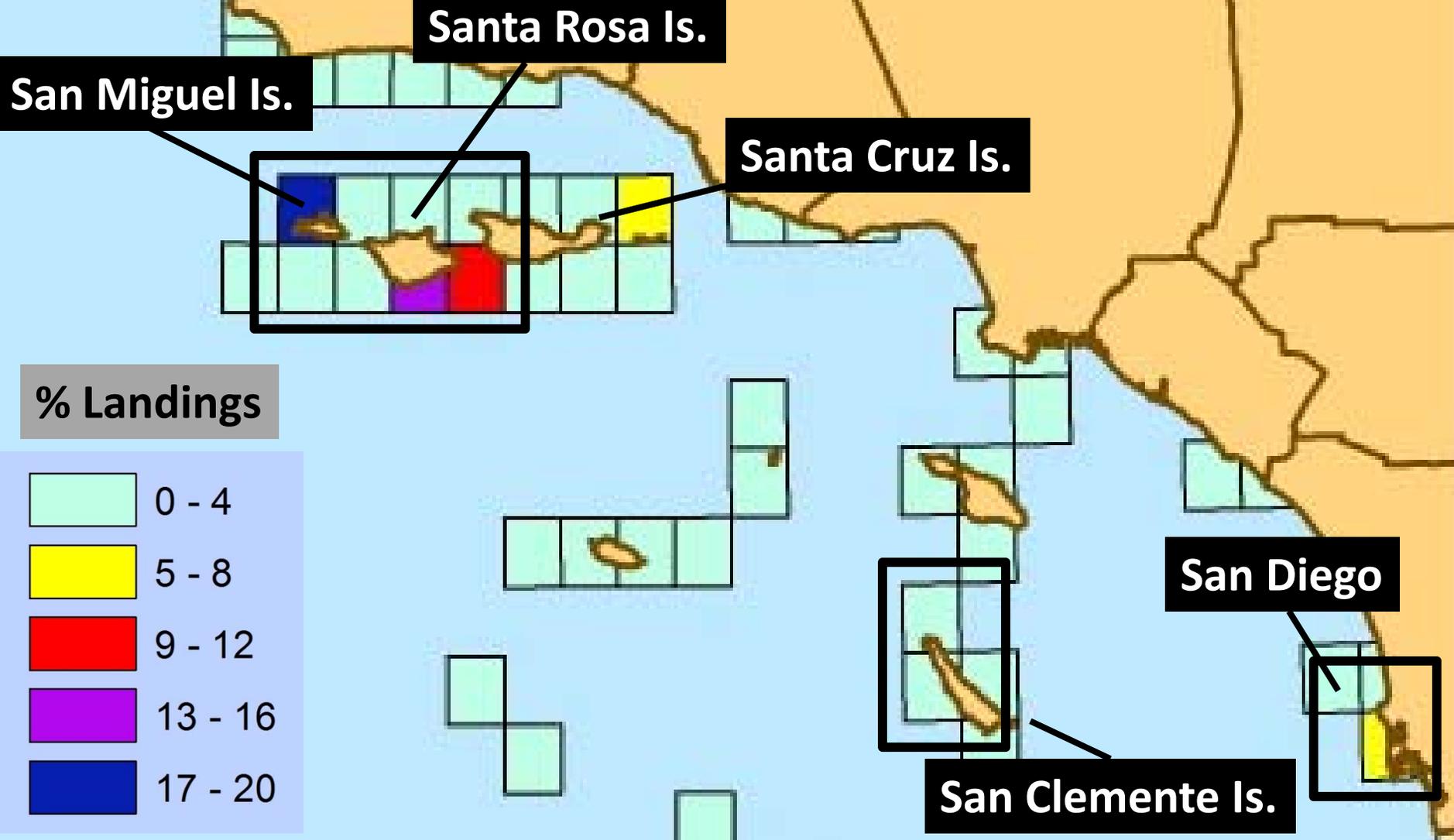
Comparison of Landings N. CA vs. S. CA 2003-2012

- 2003-2013: S. CA (79%); N. CA (21%)
 - 2003-2007: S. CA (87%); N. CA (13%)
 - 2008-2012: S. CA (71%); N. CA (29%)





Decade of Fishing-Southern California Region 1970s



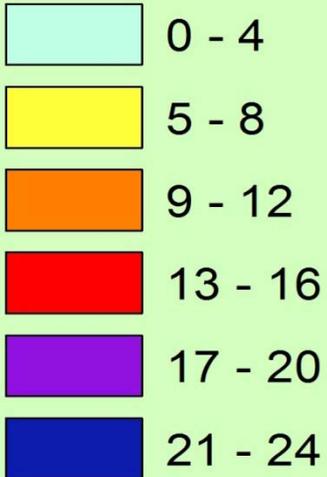
Decade of Fishing-Southern California Region 1980s

San Miguel Is.

Santa Rosa Is.

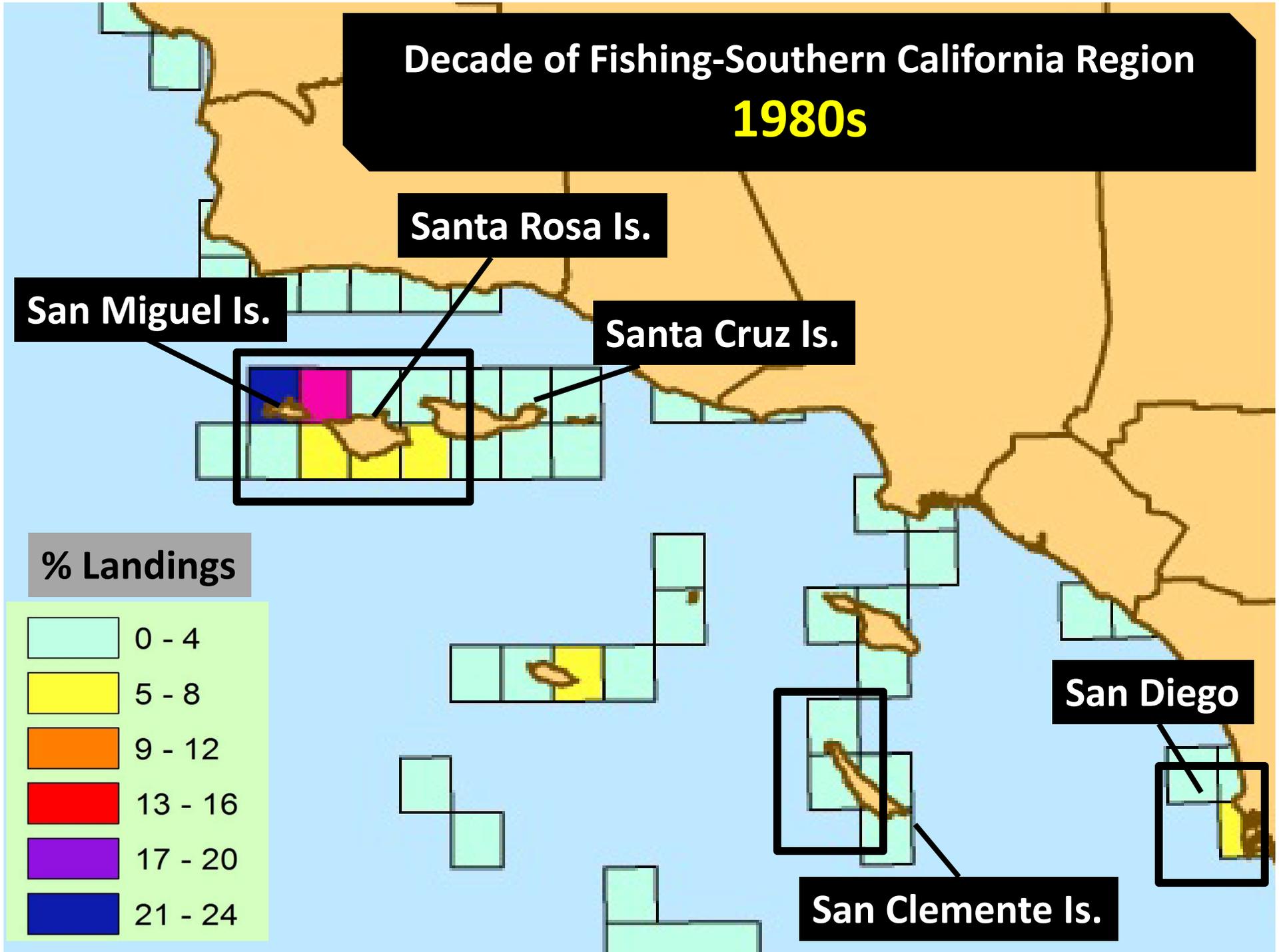
Santa Cruz Is.

% Landings



San Diego

San Clemente Is.



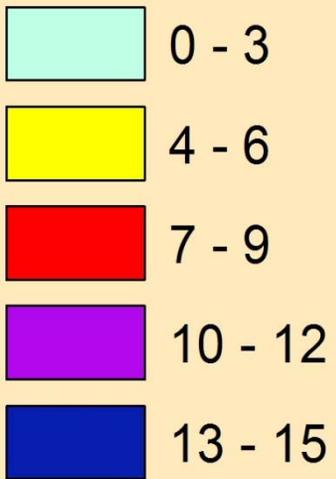
Decade of Fishing-Southern California Region 1990s

San Miguel Is.

Santa Rosa Is.

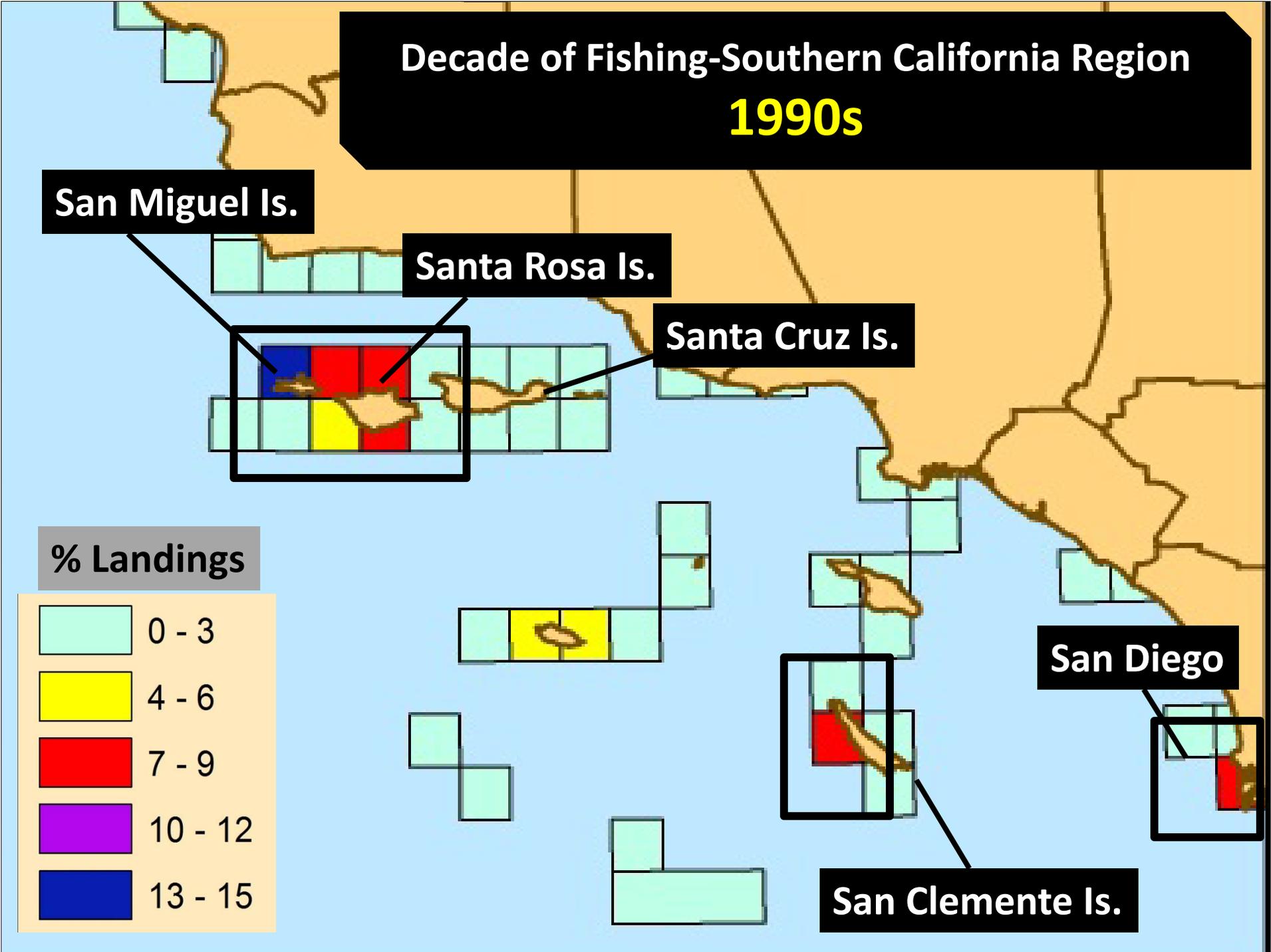
Santa Cruz Is.

% Landings



San Diego

San Clemente Is.



Decade of Fishing-Southern California Region 2000s

San Miguel Is.

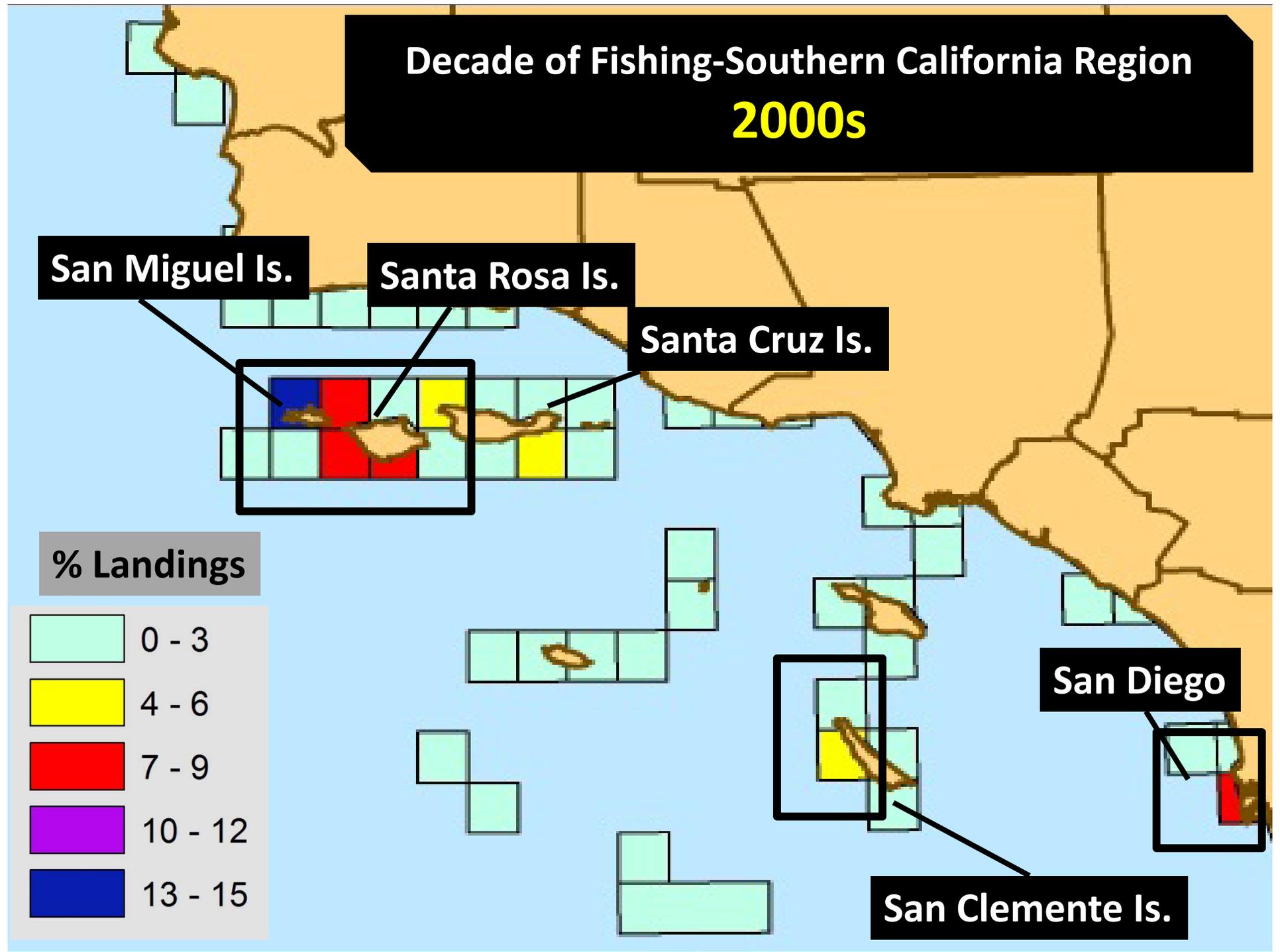
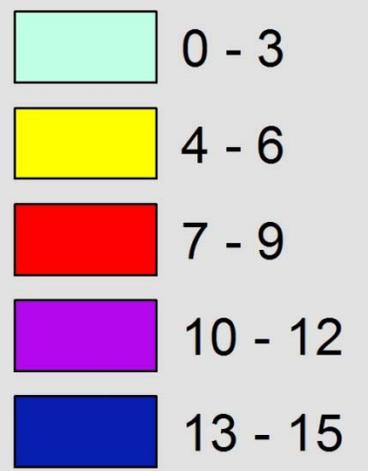
Santa Rosa Is.

Santa Cruz Is.

San Diego

San Clemente Is.

% Landings



Long Term Sustainability – Fishing Capacity

- Small percentage of 300 permits making most of the landings
 - In 2012, 50% of catch taken by 40 out of 209 active divers
 - In 2012, the top 85 divers took 80% of catch
- Landings stable in recent decades but...
 - High latent unused capacity
 - Susceptible to demand change in world markets
e.g. large price increase would drive increase in landings

Long Term Sustainability - Maximum Sustainable Yield (MSY)

- **MSY estimate based on Depletion-Corrected Average Catch (DCAC) model (MacCall 2009)**
 - Southern and Northern California analyzed separately due to unique catch history and life history parameters
- **Northern California MSY estimate was 3.3 million pounds**
 - 2012 catch was 3.2 million pounds
- **Southern California MSY estimate was 13.4 million pounds**
 - 2012 catch was 8.1 million pounds

Age Structure of Active Divers

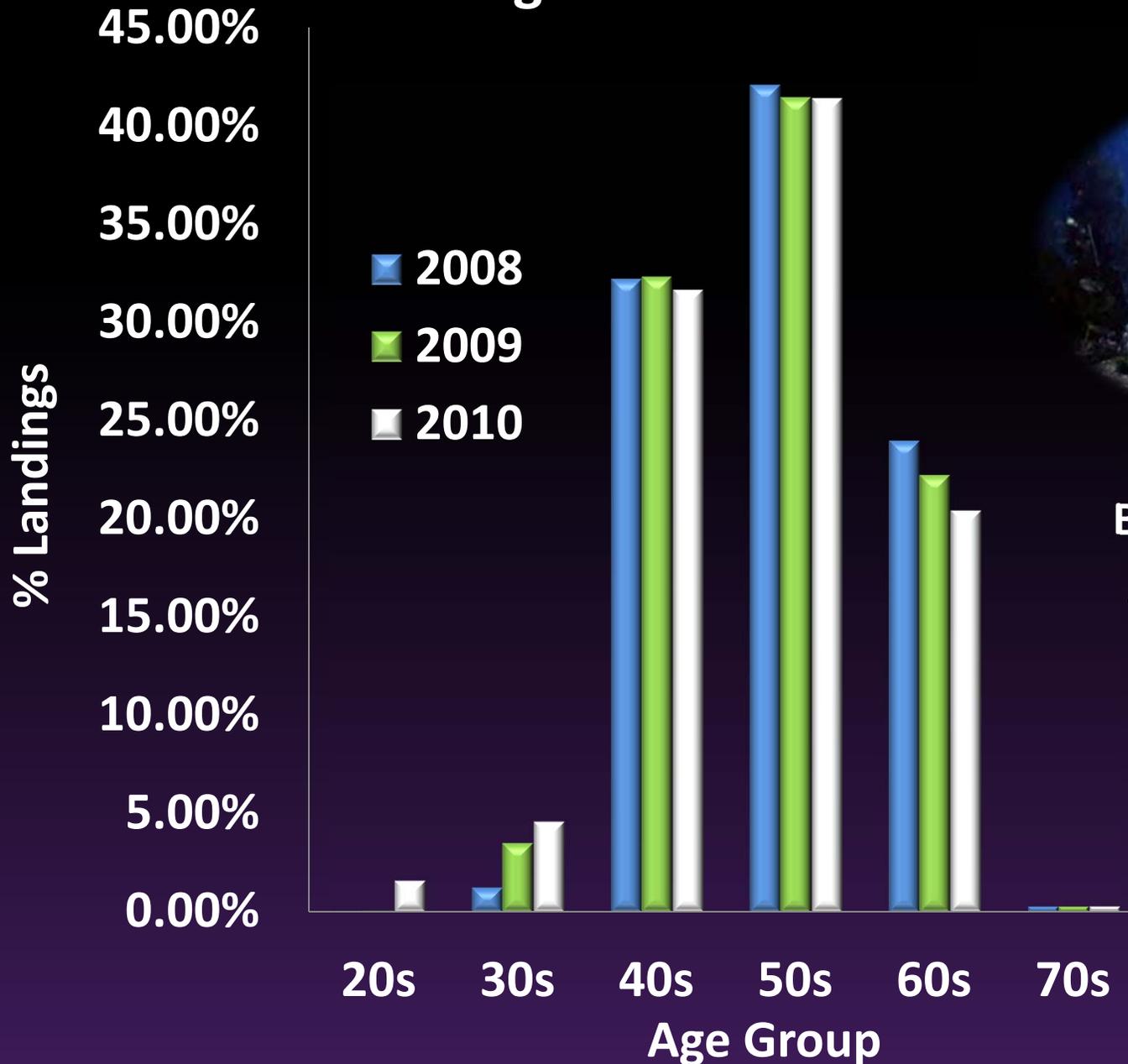


Photo Credit: Jim Cooluris

Breakdown of Age in 2011 (n=236):

20s (8)

30s (10)

40s (62)

50s (110)

60s (44)

70s (2)

Summary

Regulations have remained relatively unchanged with minimum management

S. CA dominates landings historically; recent years N. CA has been increasing

S. CA landings concentrated in about a dozen fishing blocks

Many of these blocks have seen major changes in landings over the decades

Summary (cont'd)

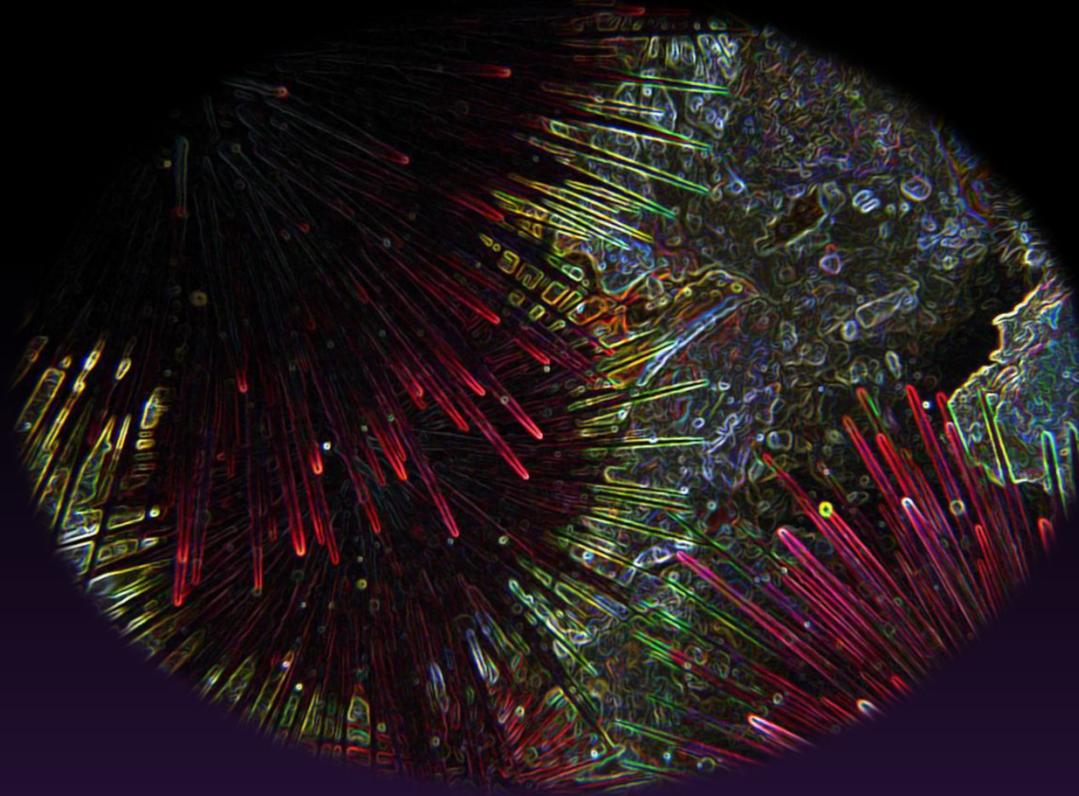
In 2012, 50% of catch made by 40 divers; top 85 divers took 80% of catch

High latent of unused capacity makes fishery susceptible to world demand

Recent Nor Cal catches close to MSY, 50% of catch taken by 11 of 41 divers

Active urchin dives are in their 40s, 50s, and 60s

Thank You ✨ Questions



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