

Progress Report on the EPO Silky Shark Stock Assessment

Comisión Interamericana del Atún tropical
Inter-American Tropical Tuna Commission (IATTC)



3rd Meeting of the Scientific Advisory Committee
La Jolla, USA, May 15-18, 2012



Topics

- Background
 - Silky sharks and the IATTC
 - IATTC Shark Technical Meetings
- Review of silky shark assessment work
 - Assessment modeling work (Stock Synthesis)
 - Update on data availability: progress and challenges
- Workplan for SAC4 assessment

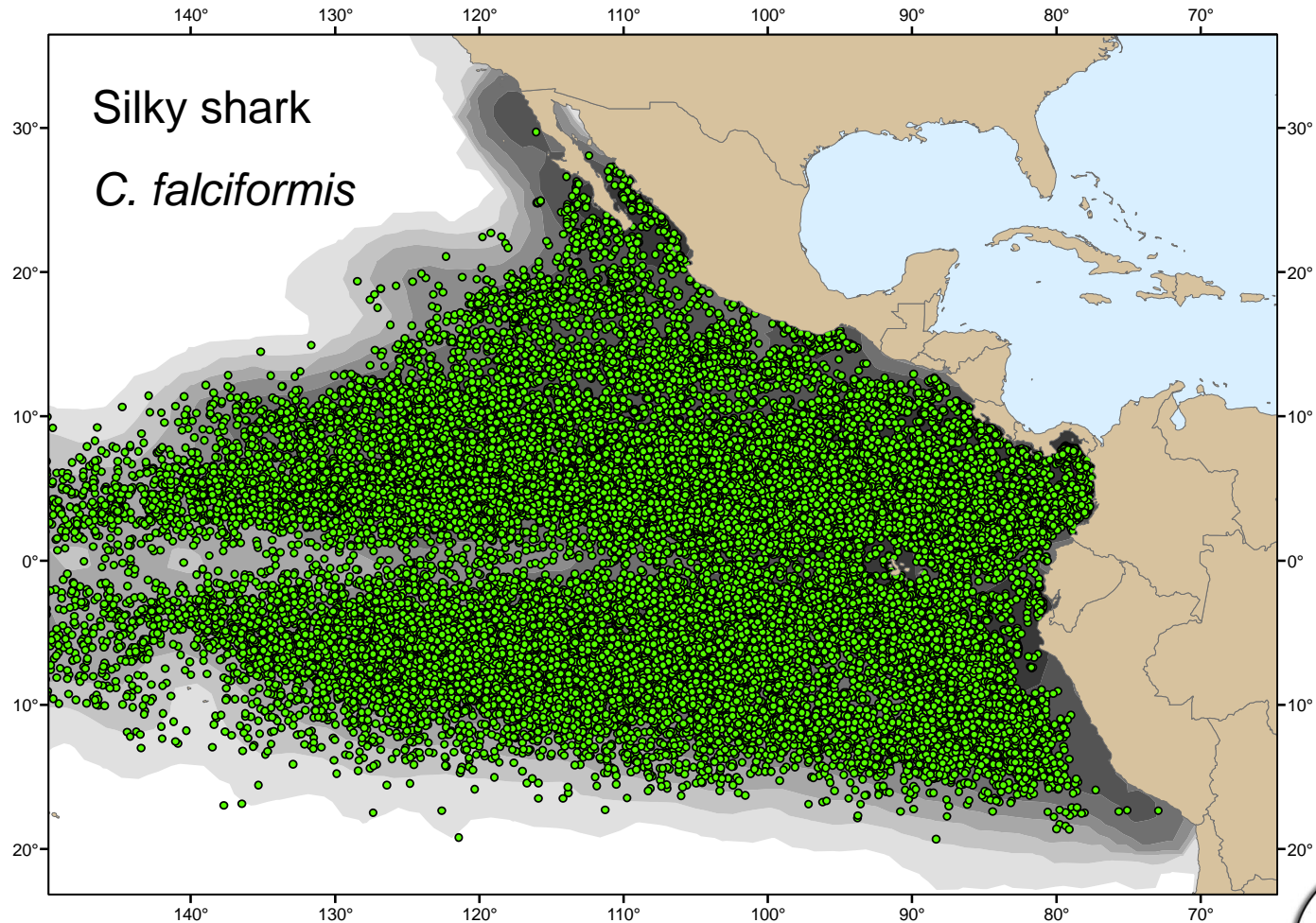


Background



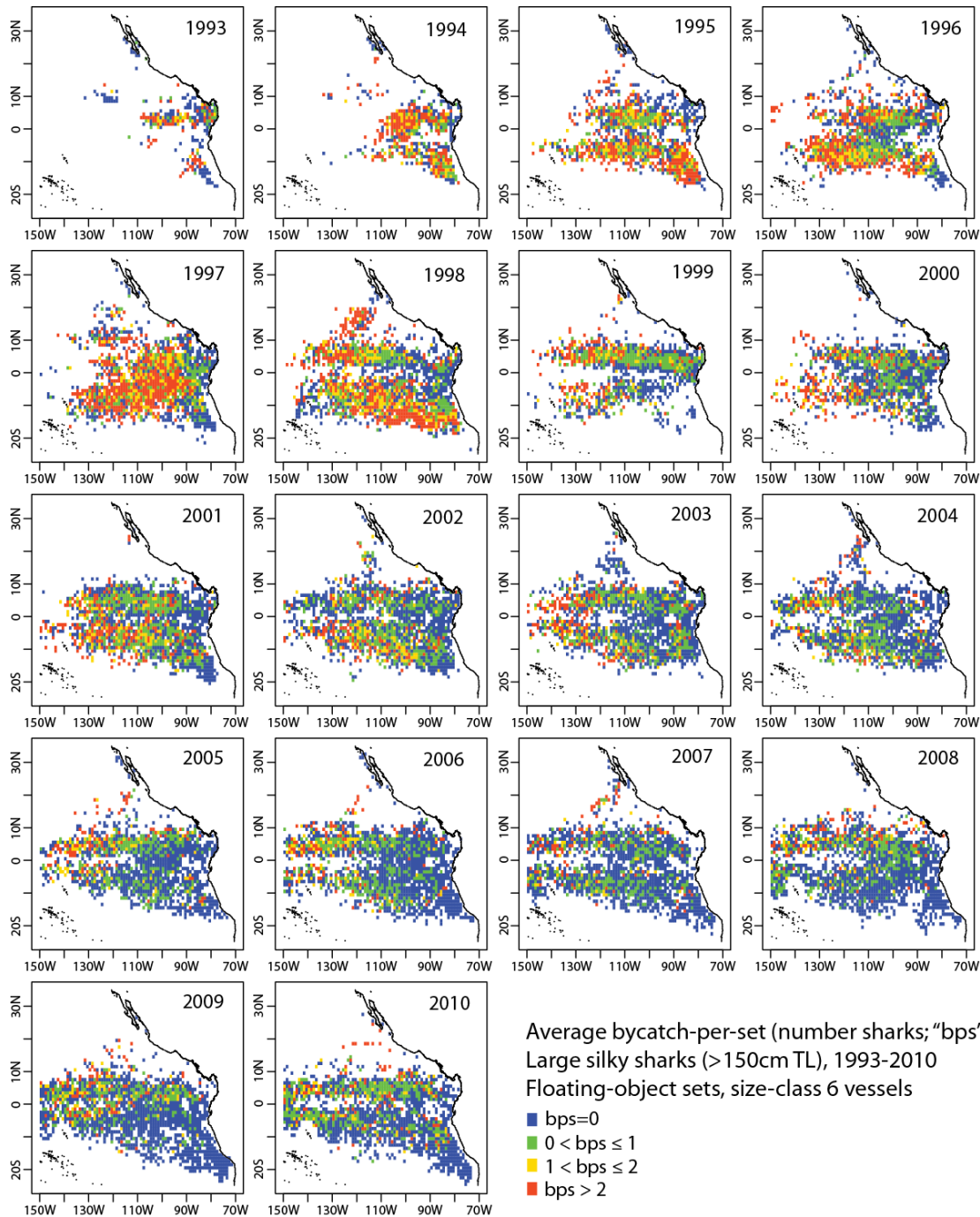
- Shark catch (bycatch) in EPO tuna fisheries:
 - Purse seine
 - High-seas longline
 - Artisanal fisheries (coastal nations)
- Indices of abundance presently only available for purse-seine fishery
- These trends are cause for concern

SIL assessment – a regional task

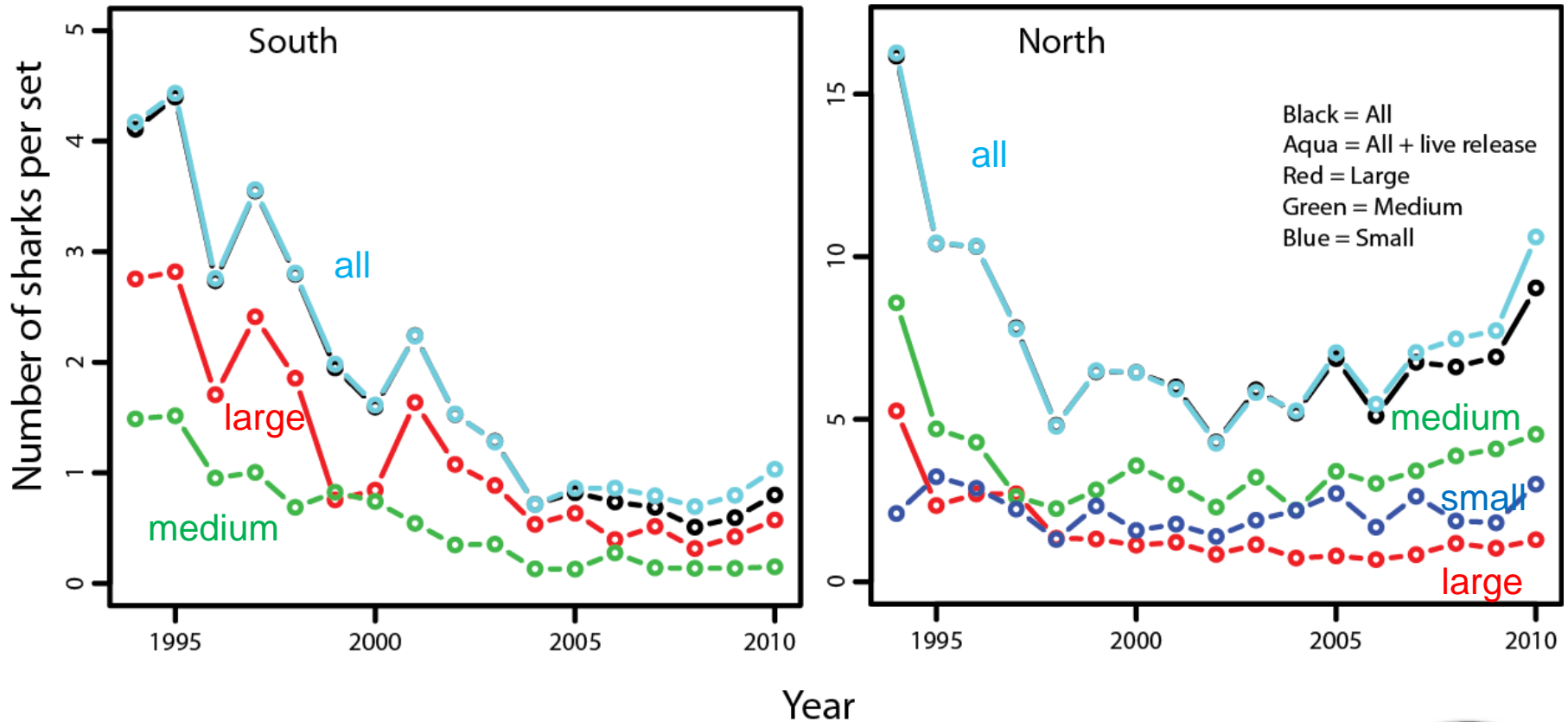


1993-present

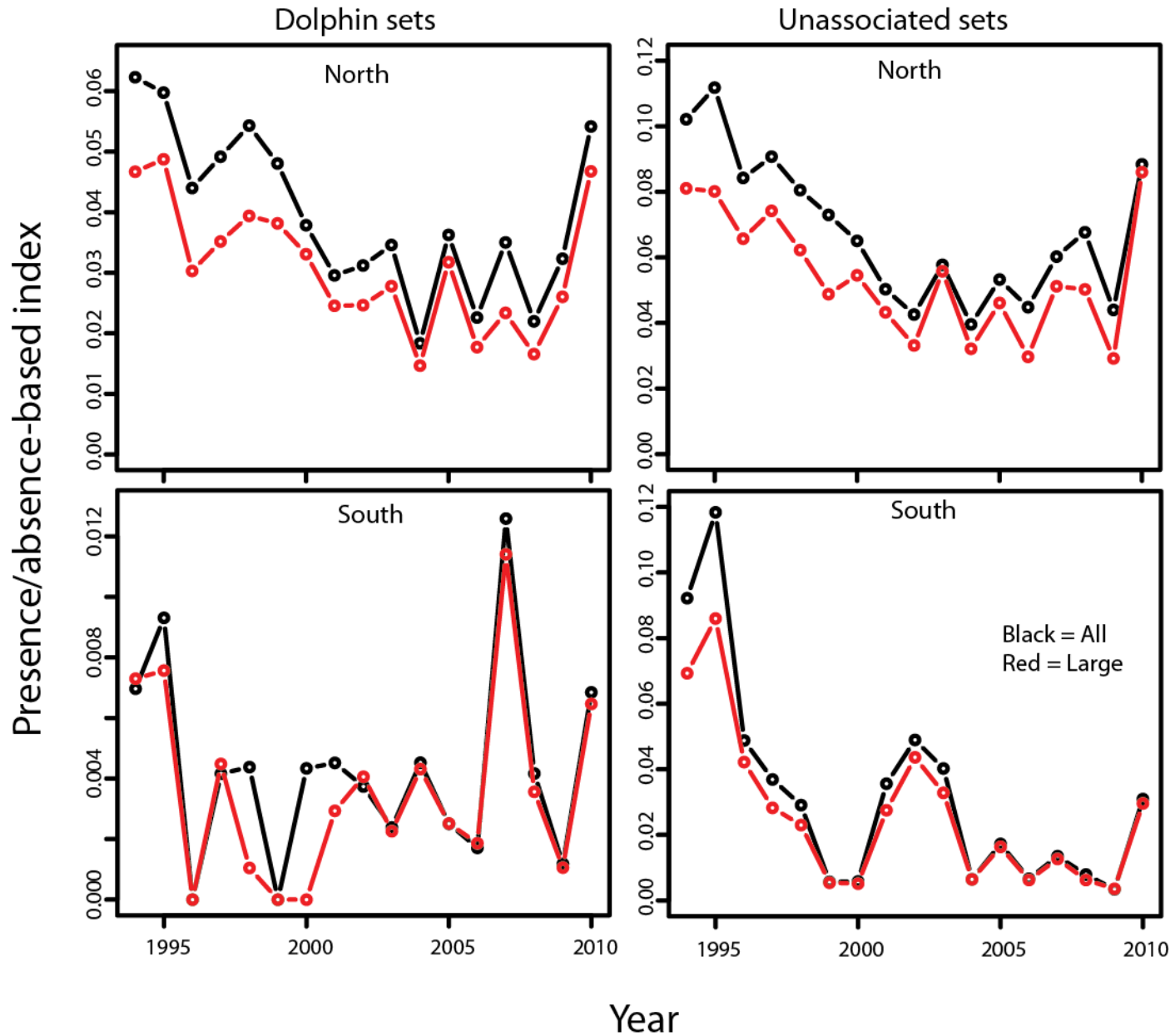




Standardized CPUE trends, floating-object sets



Standardized trends, dolphin and unassociated sets



Shark research activities



- Bycatch mitigation
 - Fishing gear (catchability and selectivity)
 - But some fisheries target sharks
- Stock assessment
 - Highlights areas where information is missing
 - Provides guidance on utility of mitigation measures
 - Evaluate fishery impacts, spatio-temporal closures
 - Information to guide management

Progress towards assessment



- Three IATTC Technical meetings

- November 2009
- May 2011
- November 2011 (“Workshop”)

<http://www.iattc.org/Meetings2011/Dec/PDFs/Shark-workshop-Meeting-report-Dec-2011ENG.pdf>

- Achievements

- Identified data requirements, sources and gaps
- Obtained and compiled several data sources
- Developed an assessment model framework (Stock Synthesis)

Model framework update



- SS model developed at the workshop
 - Stock recruitment relationship for low-fecund species (based on number of pups per female)
 - More flexible selectivity curves
 - Implementation of stock definitions (north and south)

Data availability update



- Biological

- Stock structure (genetics)
- Growth
- Length-length, Length-weight
- Reproduction (Maturity/fecundity/frequency)



- Fishery

- Catch/effort
- Indices of abundance (CPUE)
- Composition (size/stage)

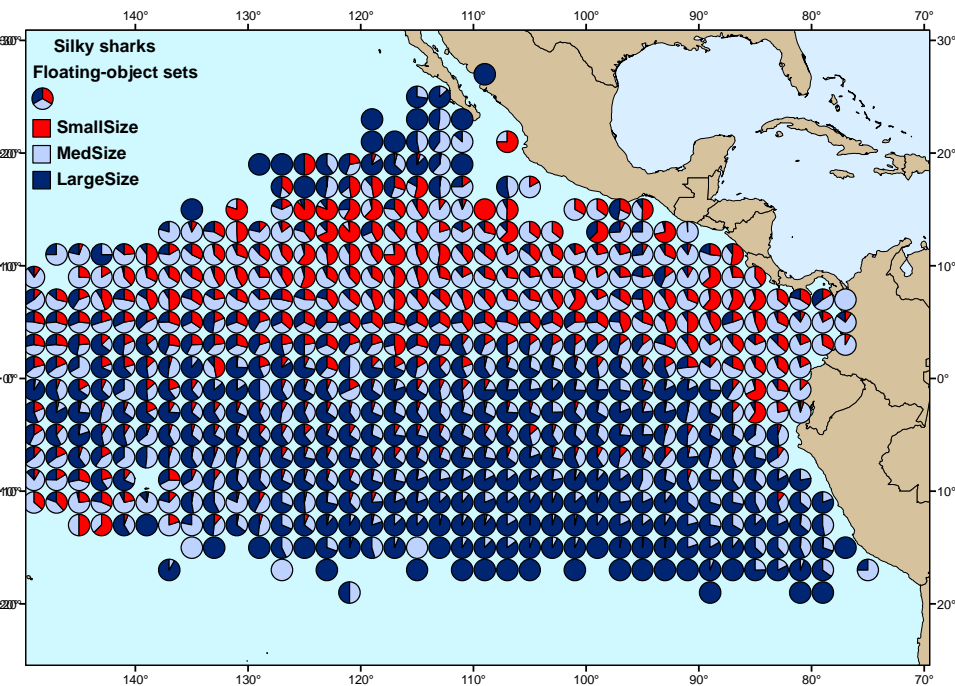
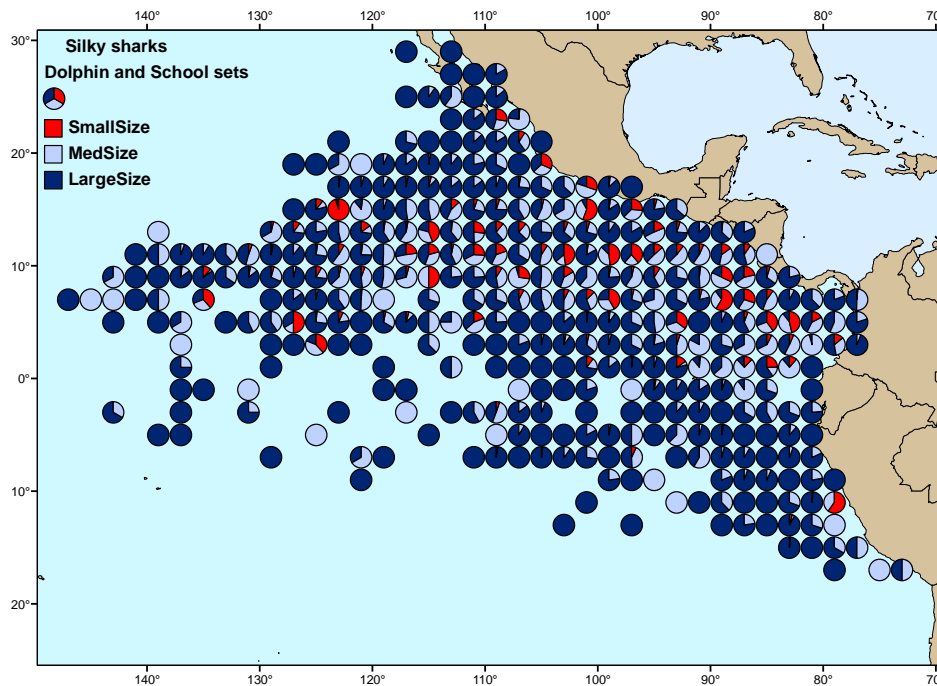
Stock structure: Spatial distribution by life-stage



School and dolphin sets



Floating object sets



Roman-Verdesoto and Orozco-Zoller, 2005

Stock structure – genetic data

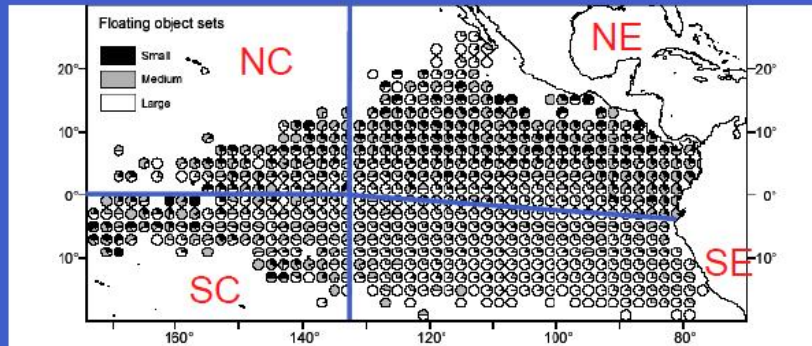
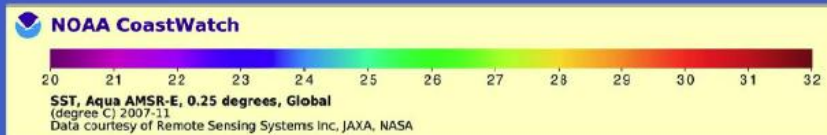
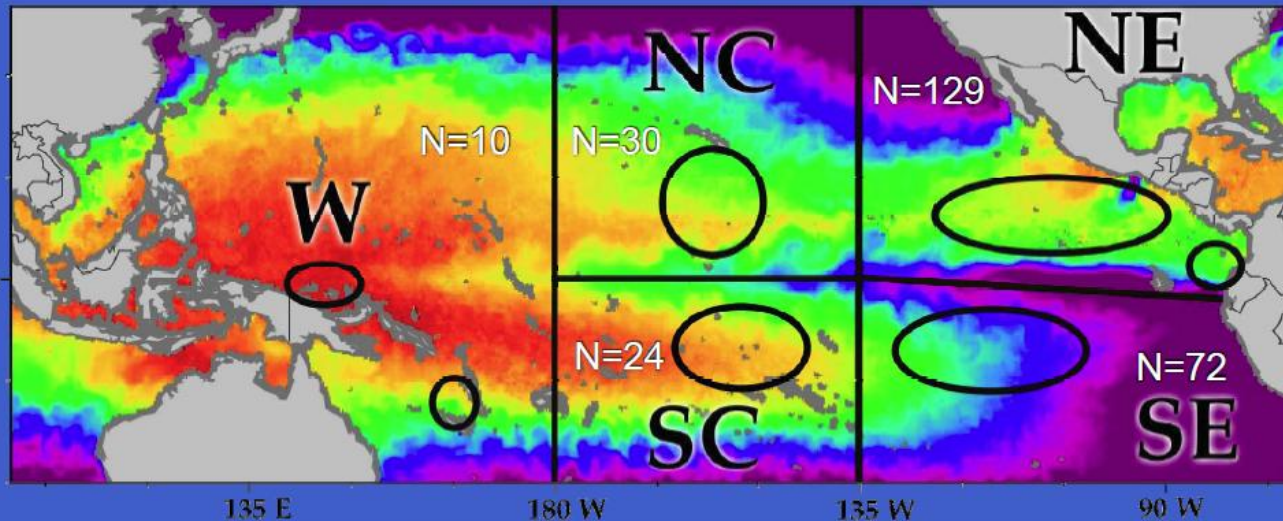


FIGURE 11. Percentage of size categories of silky sharks in the offshore area, pooled across years for 1993-2004. Data are for bycatch recorded in numbers of animals only. Román-Verdesto and Orozco-Zóller 2005

Partitioning Scheme



Shark catches in the EPO



- Bycatch of tuna purse seine fishery
 - Large vessels (class 6, >363 tons)
 - Medium-size vessels (class 1-5, \leq 363 tons)



- Bycatch of tuna longline fishery
 - High seas longline fleets



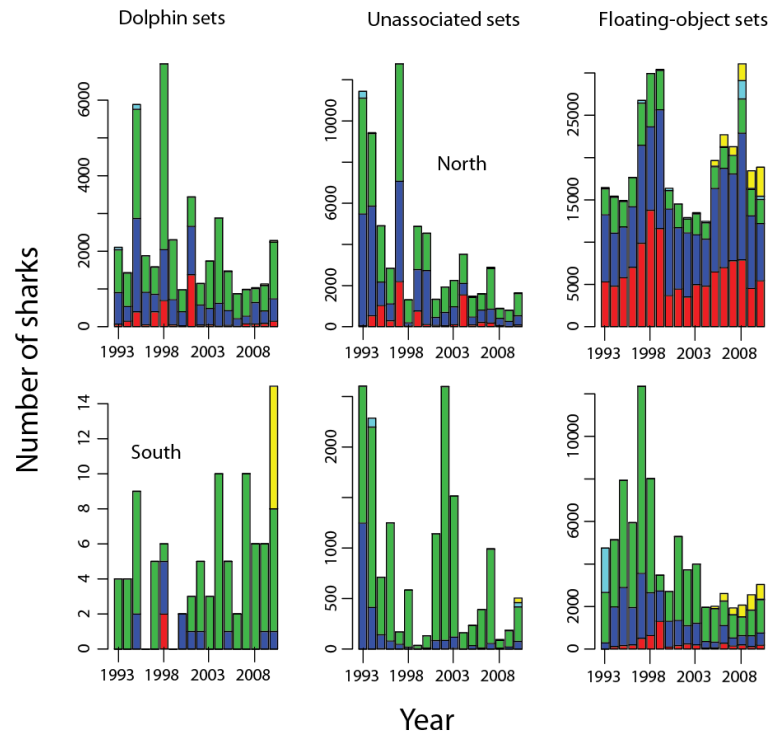
- Artisanal fisheries
 - Bycatch/target
 - EPO coastal nations



Data – purse seine catch



- Catch estimates are available, 1993-2011
 - By shark size category (<90cm TL, 90-150cm; >150cm)



Red: small sharks Blue: medium sharks Green: large sharks
Aqua: unknown Yellow: live release

Data – high-seas longline catch



- Catch estimates do not exist for all fleets
- Effort data are available
- Workshop contribution: limited observer (CHI, KOR) and training-vessel CPUE data (JPN)
- Task underway: estimate longline catches, 1993-2011



Data – coastal nations



- Data available
 - No SIL catches for many nations, but estimates of total/gray shark landings are available from various sources
 - Effort data does not exist
- Challenges
 - Landings of international high seas LL fleet landing in Central America may be duplicated with IATTC estimates of LL SIL catches
 - Species composition data not available (%SIL)
 - Total-to-dressed Weight conversion factors not available



Data – coastal nations



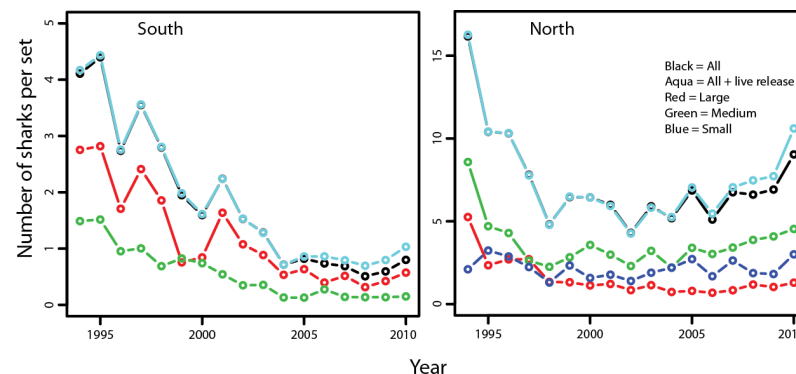
- Workshop contribution
 - Total/gray/SIL shark landing estimates (Mexico, Central-America, Ecuador); assumptions made for missing data
- Tasks underway
 - Obtain catch estimates from total/gray data
 - Work on duplication issues
 - Obtain weight conversion factors



Data – indices of abundance



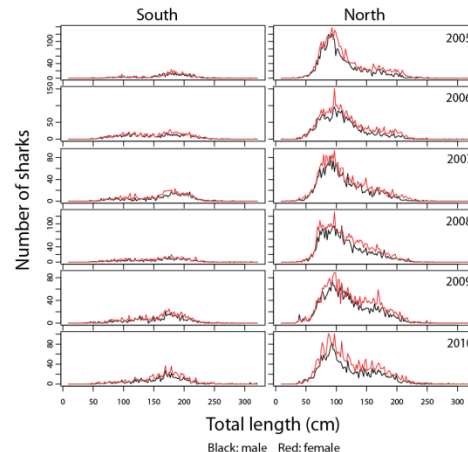
- Purse-seine CPUE data are available for class-6 vessels
- Workshop contribution: Limited artisanal CPUE data for the northern area
- Tasks underway: Estimate standardized indices from these data



Data – catch size composition



- Purse-seine size composition data are available for size-class
- Workshop contribution:
 - Limited size composition data for some high-seas longline fleets (CHI, KOR)
 - Limited size composition data for some artisanal fleets



Challenges



- Stock structure uncertain
 - Definition of stock boundary around Galapagos unclear
- Potential data duplication issues
 - High seas international fleet landing in Central-America
- Species identification
 - SIL is contained on “gray shark” category
- Dressed to total weight conversions needed
 - Costa Rica example

Plan for SAC4 SIL assessment



- Ongoing work with to reduce remaining uncertainties:
 - Stock structure (N-S split)
 - Potential duplication of Central-American sources
 - Species composition (%SIL)
 - Weight conversion factors
- Full assessment workshop (early 2013)
- Present assessment to SAC4

See report of 3rd meeting

[http://www.iattc.org/Meetings2011/Dec/PDFs/
Shark-workshop-Meeting-report-Dec-
2011ENG.pdf](http://www.iattc.org/Meetings2011/Dec/PDFs/Shark-workshop-Meeting-report-Dec-2011ENG.pdf)