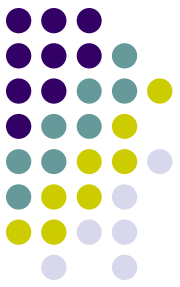


Status Report for CLS Electronic Logbook Project January 30, 2017

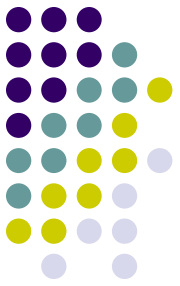
Tab F, No. 4 CLS America
Lynne Stokes, Ryan McShane, Mo Chen
Southern Methodist University



Overview of how electronic logbook data is used in estimation



- Voluntary reporting of catch by charter captains
- Transmission of reports by satellite
- Match reports with MRIP sample encounters
- Reports are used as calibration device for MRIP sample
 - Assume
$$\text{reports/total in sample} = \text{reports/total in population}$$



Status as of last report

- Summarized CLS report data to 8/31/16
 - 234 installed vessels (AL, FL, MS, TX)
 - 6073 reports
- Had not yet matched CLS reports to APAIS data
- No estimates had been calculated

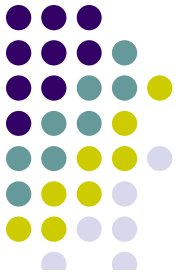


Our progress...

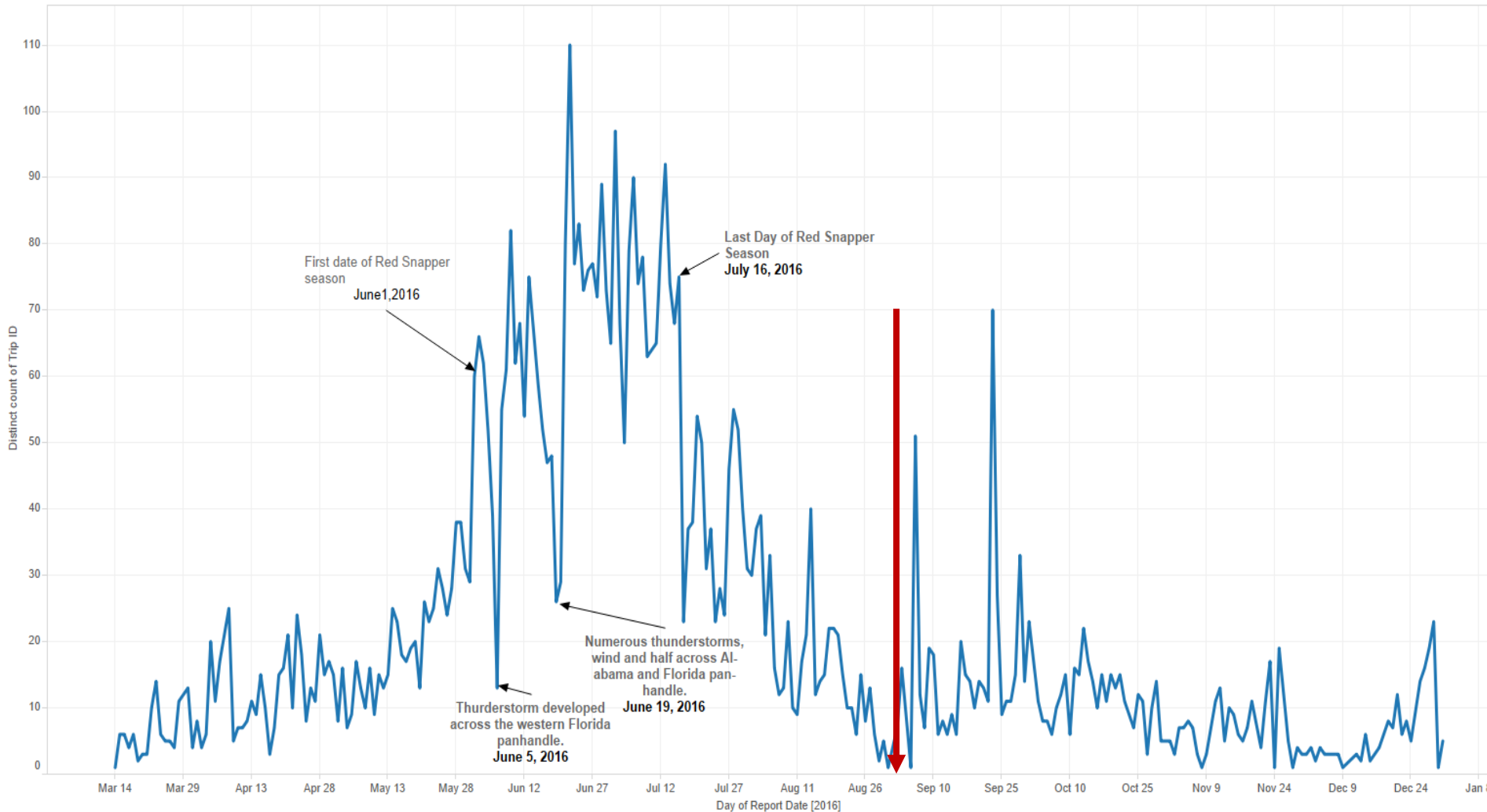
#1 Summarized CLS report data to 12/31/16

~ 6700 reports

Vessel Trip Reports (thru 12/31/16)

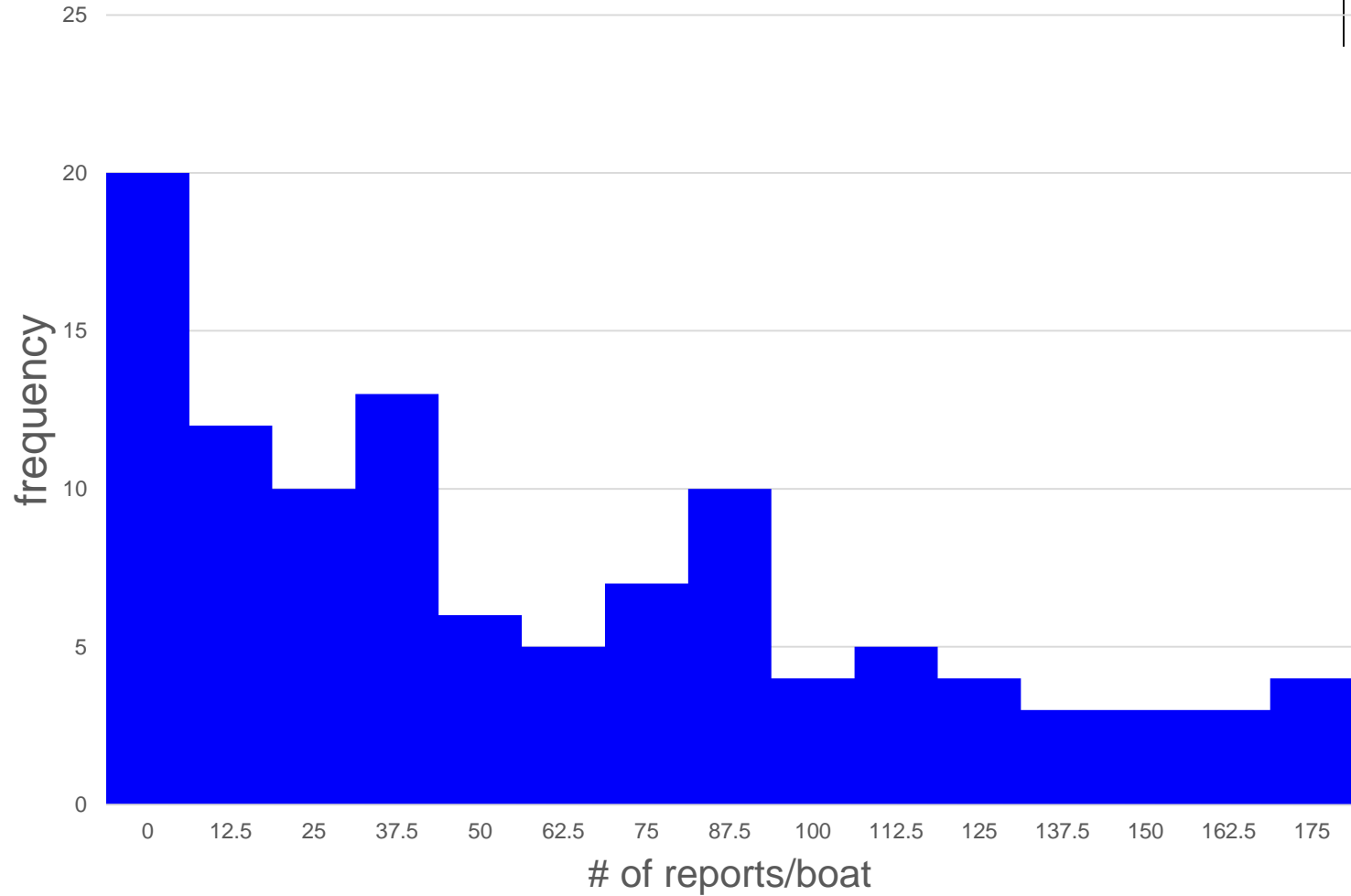


ReportsTrend



The trend of distinct count of Trip ID for Report Date Day. The data is filtered on Depart Date Year, which keeps 2016

How many reports do captains file? (thru 12/31/16)



Our progress...



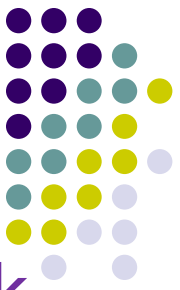
#2 Matched reports to MRIP sample of trips thru Wave 5

- Used date/time/boat as identifiers **X**
- Many captains are not reporting on return, day/time of report is not adequate for identifying matching trips
 - When multiple trips are made in one day, it is difficult (impossible?) to know which one is the matching report based on time of completion
 - New approach: identify completion of trip time by path configuration (GPS coordinates). **Not complete**

Match rates between APAIS & EL reported vessel trips



Wave	# of APAIS encounters	# (%) of Thorium Device Vessels Encountered by APAIS Samplers	# (%) of naïve trip-wise matches based on +/- 3hr window of reported return time	Upper Bound for # (%) of matched trips based on date match of reported return
3	486	151 (31%)	37 (8%)	56 (12%)
4	357	125 (35%)	36 (10%)	43 (12%)
5	232	98 (42%)	19 (8%)	21 (9%)
Waves 3-5	1075	374 (35%)	92 (9%)	120 (11%)

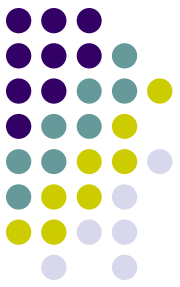


Our progress...

#3 Calculated variances of Electronic-logbook estimates (efficiency) of catch for waves 3 and 4

- Caveat: Estimates and SE's depend on match rates AND captain catch report accuracy, both of which depend on accurate matching of reports to MRIP sample trips
- When we underestimate match rate, we overestimate catch
- Because we believe we have underestimated matches so far, we don't feel confident comparing estimates yet

How precise are CLS estimates?



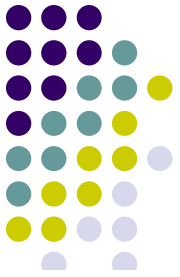
- Instead, we present information about the variance for EL estimates for three assumptions about matching and reporting
 - Scenario 1: Current match rate and reporting rate
 - Scenario 2: Upper bound match rate and current reporting rate
 - Scenario 3: What-if calculation: assume 100% reporting
- Report these variances in comparison to APAIS estimates of variance

How precise are CLS estimates? (con't)

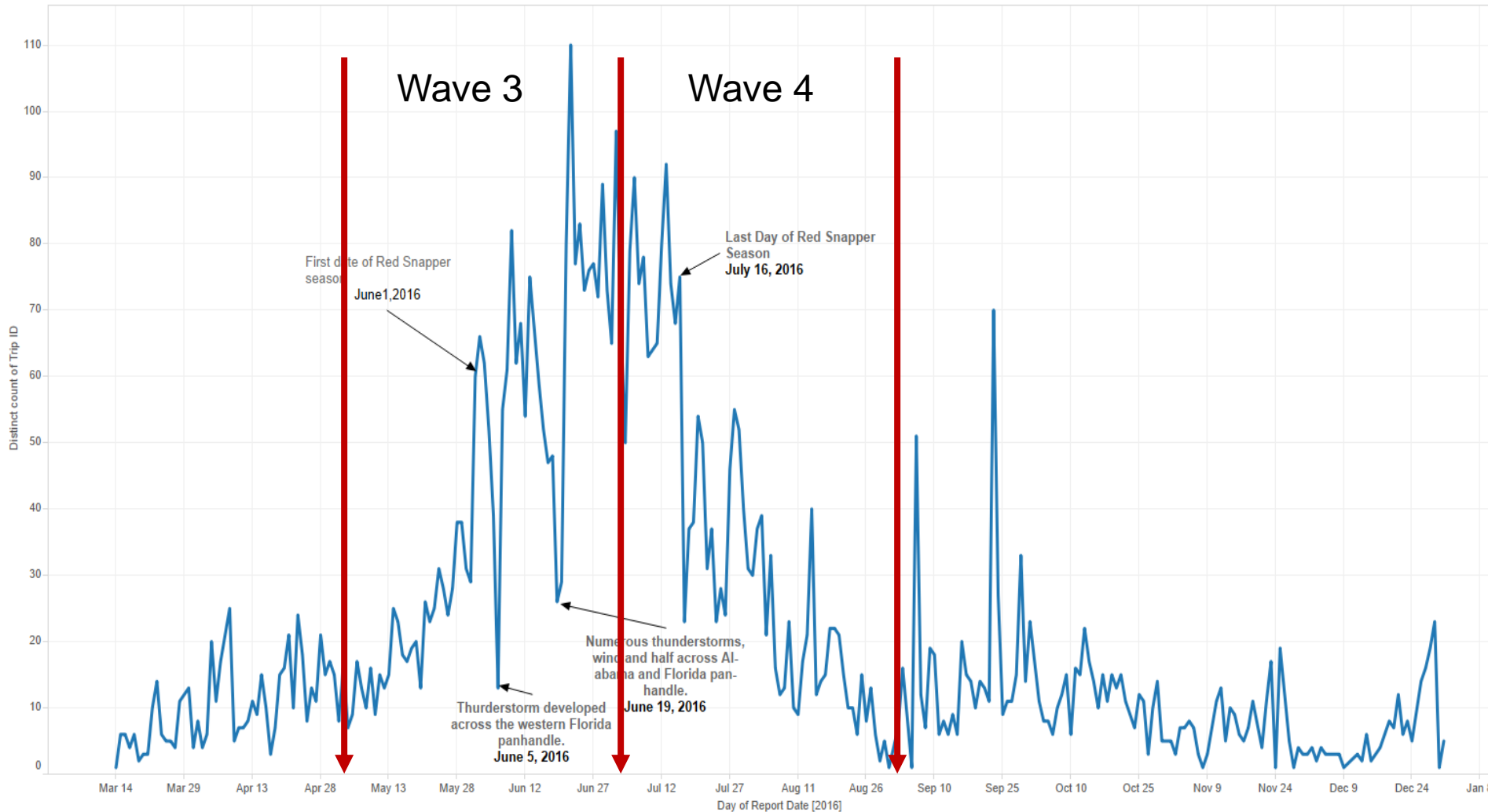


- Express efficiency of estimator as
$$\text{eff} = \text{MRIP var} / \text{ER var}$$
- So $\text{eff} = 1$ for the same, $\text{eff} > 1$ for ER better, $\text{eff} < 1$ for ER worse
- We present calculations for Waves 3 and 4

Vessel Trip Reports (thru 12/31/16)



ReportsTrend



The trend of distinct count of Trip ID for Report Date Day. The data is filtered on Depart Date Year, which keeps 2016

	Scenario 1: With current reporting & matching (~2% - 10%)		Scenario 2: With current reporting and upper bound match rate (~ 12%)		Scenario 3: What if: 100% reporting and perfect matching (~ 31%)	
	Efficiencies = Var(MRIP estimate)/Var(EL estimate)					
Species	Wave 3	Wave 4	Wave 3	Wave 4	Wave 3	Wave 4
RED GROUPER	24%	11%	41%	49%	68%	92%
RED SNAPPER	13%	42%	34%	49%	155%	116%
VERMILION SNAPPER	13%	29%	25%	75%	54%	70%
WHITE GRUNT	4%	10%	23%	39%	45%	132%
RED PORGY	17%	9%	17%	15%	40%	43%
LITTLE TUNNY	16%	4%	25%	16%	44%	46%
KING MACKEREL	7%	17%	18%	21%	42%	48%
AVG	13%	18%	26%	38%	64%	78%

Accuracy of catch reporting



- The calculations assumed the reporting accuracy we are seeing with our current matching
- Current estimates of correlation between reports and APAIS data range from negative values to 1.
- This should improve some when we improve matching.
- Calculations show that the efficiencies are not too dependent on report accuracy however.

How can current estimates be improved?



- Variety of ways to improve efficiency
 - ↑ # of devices
 - ↑ reporting rate
 - ↑ verification sample size
 - Find a way to identify and use in estimation all trips on equipped boats, even if catch is not reported (work for analyst)
 - Have software “automate” end-of-trip reporting so that matching is facilitated

What would result in data that provides estimates with variance equivalent to that of APAIS?



Variety of ways:

- Some examples...
 - Current number of devices, Current level of reporting, we improve our matching, ~ quadruple verification sample size
 - Double number of devices, current level of reporting but make it accurate, increase APAIS sample by about 75%
 - Current number of devices, 100% reporting, reporting accuracy at current level, increase verification sample by about 40%