Genetics Workgroup Summary

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SEDAR 58 COBIA STOCK ID REVIEW WORKSHOP

Appointed Workgroup Participants

George Sedberry (Chair)	SAFMC SSC
Meredith Bartron	USFWS
Tanya Darden	SCDNR
John Gold	Texas A&M (retired)
Jeff Isley	SEFSC Miami
Jan McDowell	VIMS

Stock Definitions

- Genetics-based stock:
  - Goal – to identify biological reproductive groups
  - Sampling – exchange of genetic material occurs during the spawning season
- Movement-based stock:
  - Goal – to identify groups that co-occur throughout the year
  - Important to consider during other (non-spawning) periods when fishing may also occur

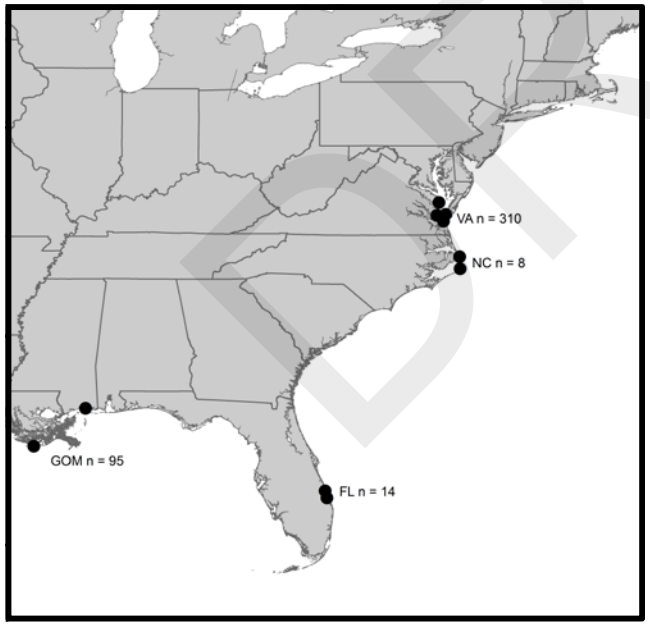
Genetic Data Sources

- Working Papers:
  - SEDAR58-SID-03: McDowell, VIMS Cobia genetics study
  - SEDAR58-SID-04: Darden et al. 2018, Cobia genetics analysis within U.S. Coastal Waters
- Relevant Reference Documents:
  - Hrincevich 1993 (SEDAR58-RD06)
  - Gold et al. 2013 (SEDAR58-RD07)
  - Darden et al. 2014 (SEDAR58-RD08)
  - Lefebvre & Denson 2012 (inshore spawning in SC; SEDAR58-RD21)
  - Perkinson et al. 2018a (telemetry & genetics; SEDAR58-RD22)

Microsatellite Marker Suites

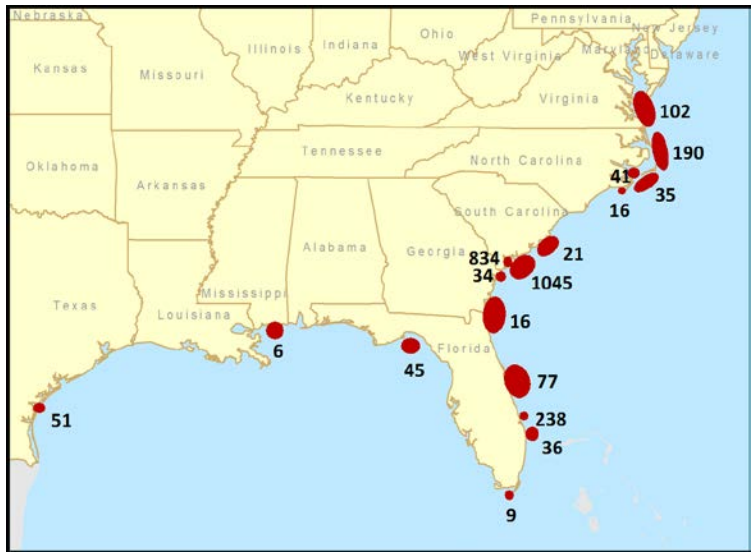
McDowell et al. VIMS

- 27 loci, 3 –25 alleles/locus
- Sample sizes
  - VA: 310
  - GOM: 95
  - NC: 8
  - FL: 14
- Sequencing
  - mtDNA
  - 161 samples



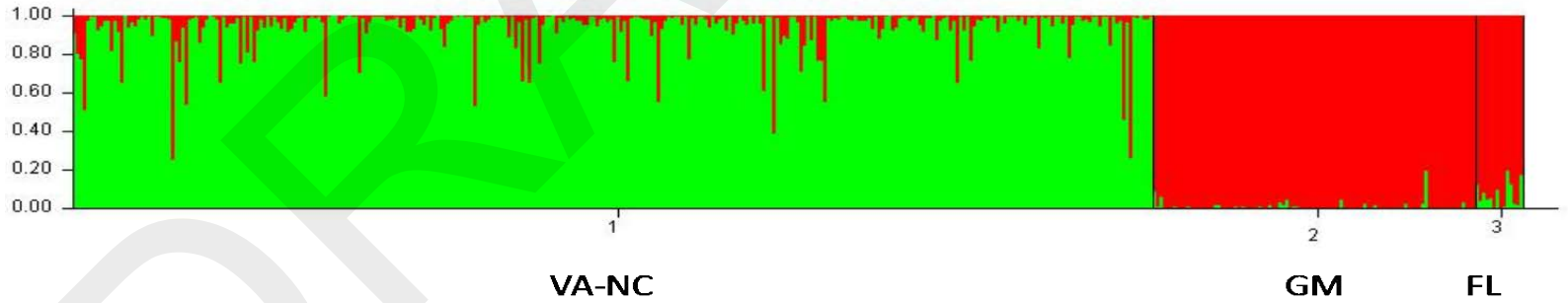
Darden et al. SCDNR

- 10 loci, 6 –23 alleles/locus
- Samples: 2,796 from 18 locations



VIMS Results

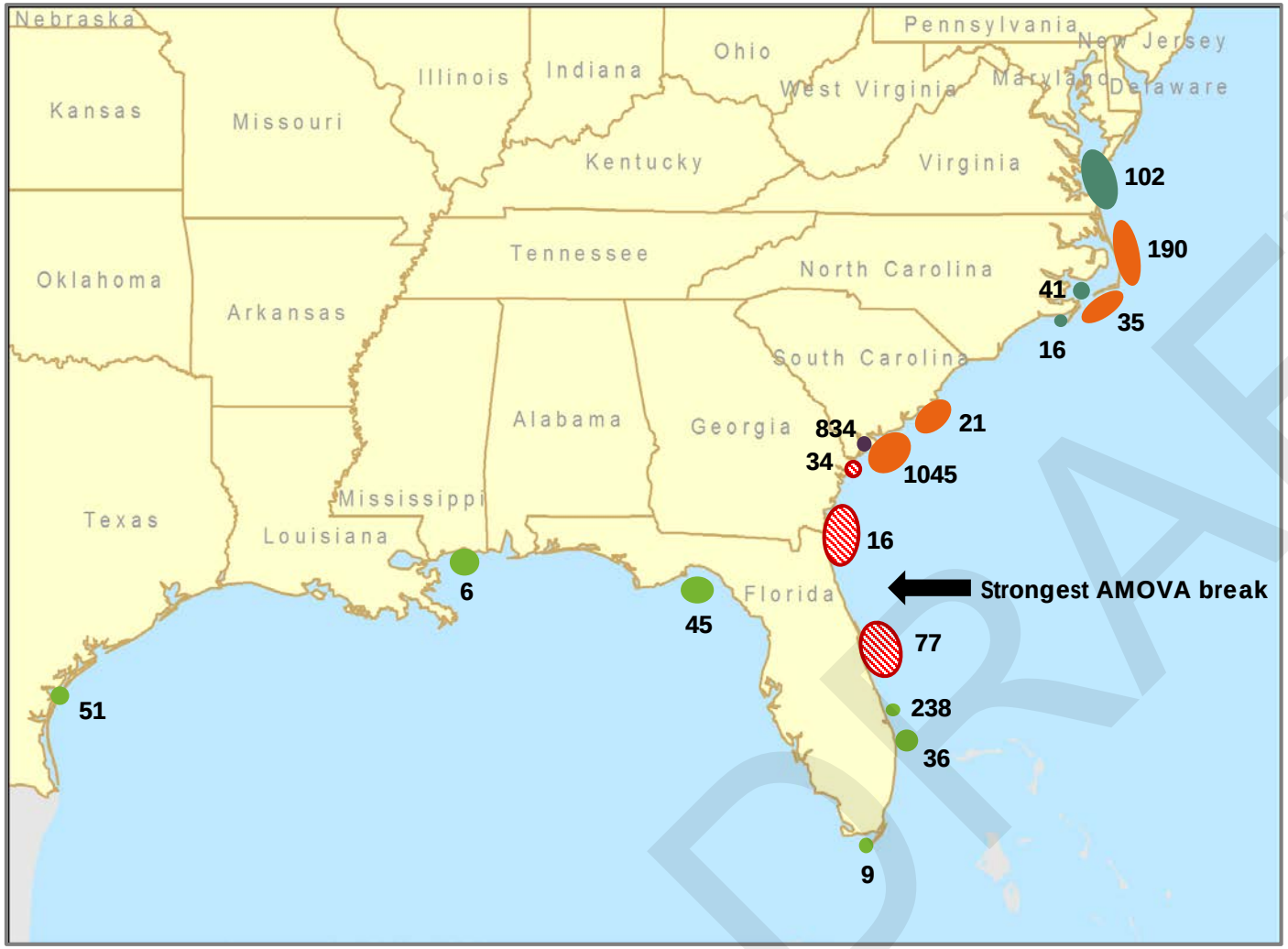
- Microsatellite:
  - Significant pairwise Fst



- mtDNA:
  - Unique haplotypes present in Atlantic and GOM; Global test of differentiation significant
- Support distinction between Atlantic (VA/NC) and GOM
  - FL (Stuart) samples are similar to GOM samples

SCDNR Results

- Sample collection: 2005-2017 (~1.5 generations)
- Sample selection criteria:
  - Hatchery and duplicate samples removed
  - Family structure evaluated
  - Three datasets evaluated – similar patterns
    - Collected during spawning season as defined for each state
- STRUCTURE, pairwise Fst, AMOVA analyses



- Homogenous GOM through Ft. Pierce, FL
  - Genetically different from SC-VA
- 'Zone of uncertainty'
  - Cape Canaveral, FL to Savannah, GA
- Substructure within Atlantic
  - Homogenous Offshore SC/NC
  - SC Inshore DPS
  - VA/NC Inshore DPS

- Support distinction between Atlantic and GOM (with low levels of gene flow)
- Current management boundary occurs within the Zone of Uncertainty

Genetics Conclusions

- Genetically distinct spawning stocks occur in the Atlantic (VA to Port Royal Sound, SC) and Gulf of Mexico (extending northward along Atlantic coast to Fort Pierce, FL)

- Spawning stock transition zone within the range from Savannah, GA through Brevard County, FL

- Additional genetic data has reinforced conclusion from prior SEDAR of presence of stock separation within the geographic range and does not refute the placement of the stock boundary at the FL/GA line