**South GSL females**

General question: Sampled area constant over time? If not, what were the years in which a change in survey area occurred?

* The survey more or less gradually expanded into marginal habitat areas until 2005. Since 2006, survey stations were spatially homogeneous, though reshuffling of the station locations were made in 2006 and 2011 and 2012.
* In earlier survey years, I would consider that the survey area covered most of the prime habitat, though it is possible that adding more marginal habitat would change the proportion estimates somewhat.
* I suspect that there are sampler/year effects in the shell condition categorizations. Comparisons with colorimeter data in 2018 showed that there was an issue distinguishing between shell condition 2 and 3 for that year. Survey year 1995 in particular shows very low levels of new-shelled crab.
* 1996 was a partial survey year, with only 72 tows performed that year.

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| Fig. 1 | 1) What do the error bars represent?   * Confidence intervals of the aggregate samples.   2) What is the sample size by year?   |  |  |  | | --- | --- | --- | | year | immature | mature | | 1990 | 1717 | 3792 | | 1991 | 436 | 794 | | 1992 | 1311 | 700 | | 1993 | 1692 | 209 | | 1994 | 6641 | 824 | | 1995 | 6982 | 11 | | 1996 | 561 | 250 | | 1997 | 7477 | 3099 | | 1998 | 7157 | 3212 | | 1999 | 6146 | 2648 | | 2000 | 3949 | 3935 | | 2001 | 1412 | 3048 | | 2002 | 1533 | 705 | | 2003 | 2636 | 502 | | 2004 | 3450 | 932 | | 2005 | 4042 | 1143 | | 2006 | 4526 | 963 | | 2007 | 5486 | 1142 | | 2008 | 5055 | 1606 | | 2009 | 4578 | 1882 | | 2010 | 5968 | 2877 | | 2011 | 5454 | 1395 | | 2012 | 5250 | 1917 | | 2013 | 3045 | 1953 | | 2014 | 3908 | 1435 | | 2015 | 4821 | 1449 | | 2016 | 5490 | 1712 | | 2017 | 5871 | 1836 | | 2018 | 6339 | 3326 | | 2019 | 8876 | 3283 | | 2020 | 8657 | 2443 |   3) Judging from the error bars, I assume the sample size was very small in 1993, 1995, and maybe also in 1994 and 1996?   * Yes, see table above   4) Comparison to nGSL (see slide 9 in my Norway presentation):   * sGSL and nGSL show same general pattern of declining CW from 1991 to 1997 then increasing CW until 2004 in sGSL and 2007 in nGSL; CW in sGSL declines from 2004 to 2007; * CW in sGSL and nGSL is stable from 2007 to 2015, after which it declines in sGSL but increases in nGSL to a record high in 2017-2018 and decreases in 2019 (2020 data pending) * females in sGSL about 5-10 mm larger by year than those in nGSL from 1991 to 2006, about 1-2 mm larger by year from 2007 to 2015, and about 3-12 mm smaller from 2016-2019. |
| Fig. 2 | 1) These are only new shell females, correct?   * Yes, these analyses are with new-shelled only.   2) The proportion mature by 1-mm size class is observed, correct?   * In this particular graph it is a GAM smoothed curve, I have included the empirical values in another corresponding graph.   3) Short white bars extending directly from the x-axis (in 1990, 1992 and 2020) indicate that no female in the corresponding size classes were found, correct?   * They are white because the prediction error of the GAM was deemed too high.   4) In 1995, the only mature females appear to be >70 mm CW. How is it that mean CW for mature females in 1995 is only about 54 mm CW (see Fig. 1 above)?   * 1995 sample size is way too small for inference |

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| Fig. 3 | 1) These are only new shell females, correct?   * New-shelled, yes   2) These maturity ogives are modeled from data in Fig. 2 above use a GAM, correct?   * yes   3) Two annual ogives trend down past 70 or 80 mm CW, with one going to 0 at 88 mm CW. Were very large immature females (>80 mm CW) actually found?   * Probably 1995, which should be ignored.   4) Some annual maturity ogives suggest some occurrence of mature females at <30 mm CW… I assume this is just a modeling quirk?   * I’ll check how the maturity was determined for small sizes, they should all logically taper to zero. |
| Fig. 4 | 1) The anomalies here are based on the difference between the modeled annual maturity ogive and the average maturity ogive, correct?   * The scale for these calculations is on the logit-scale, including the average.   2) I can see how you could get positive anomalies in the range of 30-38 mm CW, but I don’t understand the negative anomalies over this size range as the average maturity ogive is at zero for these sizes. Maybe the graph should be cut off at the size bin just below the size bin including the smallest ever recorded mature new shell female.   * The inferences for small sizes is uncertain, and I must check how maturity is determined for small sizes.   3) Short white bars extending directly from the x-axis (in 1990, 1992 and 2020) do not extend to the same size class as in Fig. 2.   * These are determined by prediction uncertainty,   4) For 1995, why is the whole column not in dark blue shades as Fig. 2 shows only the very largest females were mature?   * The prediction for 1995 was too high, thus it was blanked out. |