Influential Years Analysis

Validation of the Jul-Sep landings base models

To evaluate the environmental covariates, GAM and linear models were fit leaving one year out (year shown on the x-axis). The far right shows the fit to all years.

In Figure 1D, the ΔAIC values are the AIC minus the AIC of the best model (model with lowest AIC). Models with ΔAIC with 0.5 are similar and "best". Models within 2 of the best models are competitive. Models with ΔAIC greater than 2 are uncompetitive.

The Figure 1D shows that the best model was always one of GAM with Oct-Mar and Jul-Sep landings in the prior season, GAM with Oct-Mar landings in the prior season, or a linear model with Oct-Mar landings in the prior season. There were cases where deleting a year removed one of these three from the 'best' category, but they were still in the 'competitive category.

Because the covariate tests indicated that 1994 was a very influential year for the environmental covariates, 1994 was removed. The Leave-one-out base model selection tests were therefore repeated with 1994 removed. Thus these tests have 1994 and one other year removed. With 1994 only removed, a linear model with Oct-Mar landings in the prior season was the only 'best' model for all but 3 years and for 2 of those 3, it was still within ΔAIC of 2 of the best model and the year where $\Delta\text{AIC} > 2$ was 2.71.

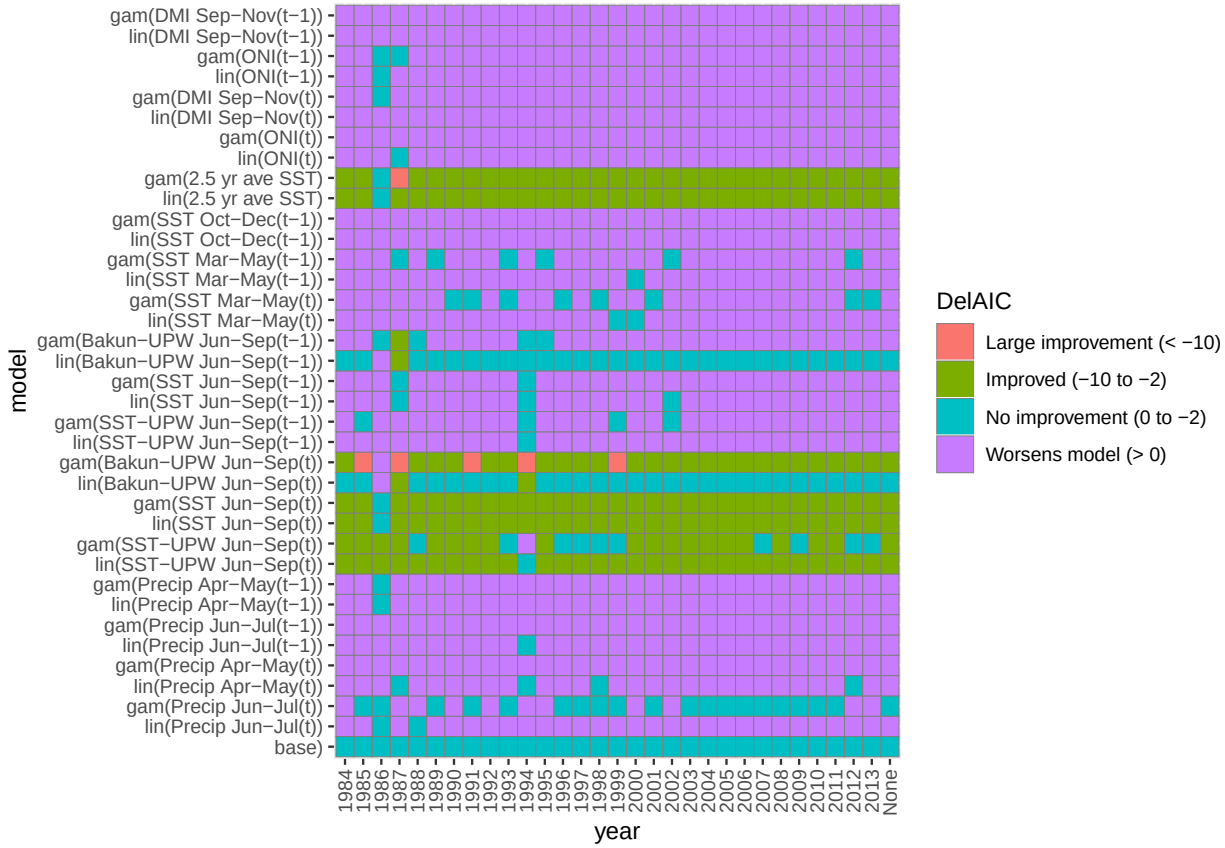


Figure 1D. Delta AIC for the Jul-Sep landings base models with one year deleted. Deleted year is shown on the x-axis.

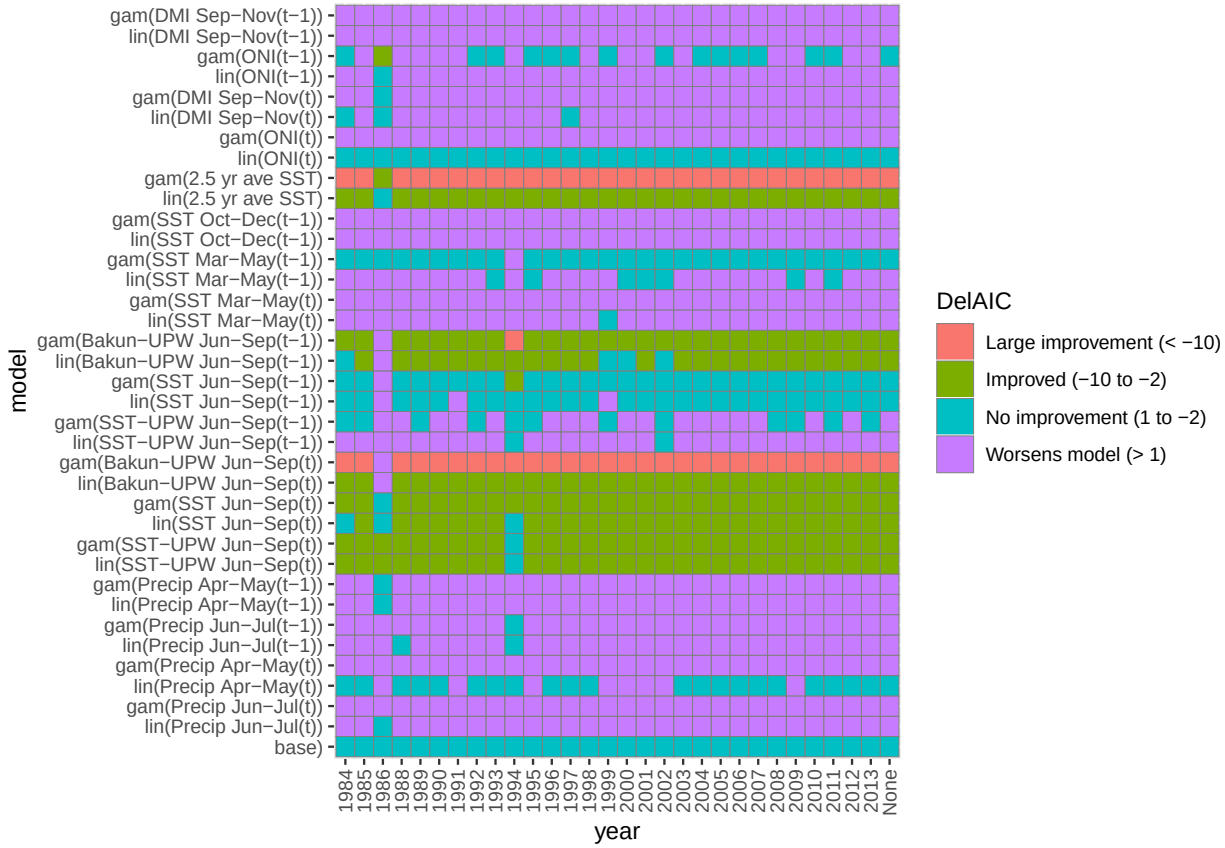


Figure 1D. Delta AIC for the Jul-Sep landings base models with one year deleted. Deleted year is shown on the x-axis.

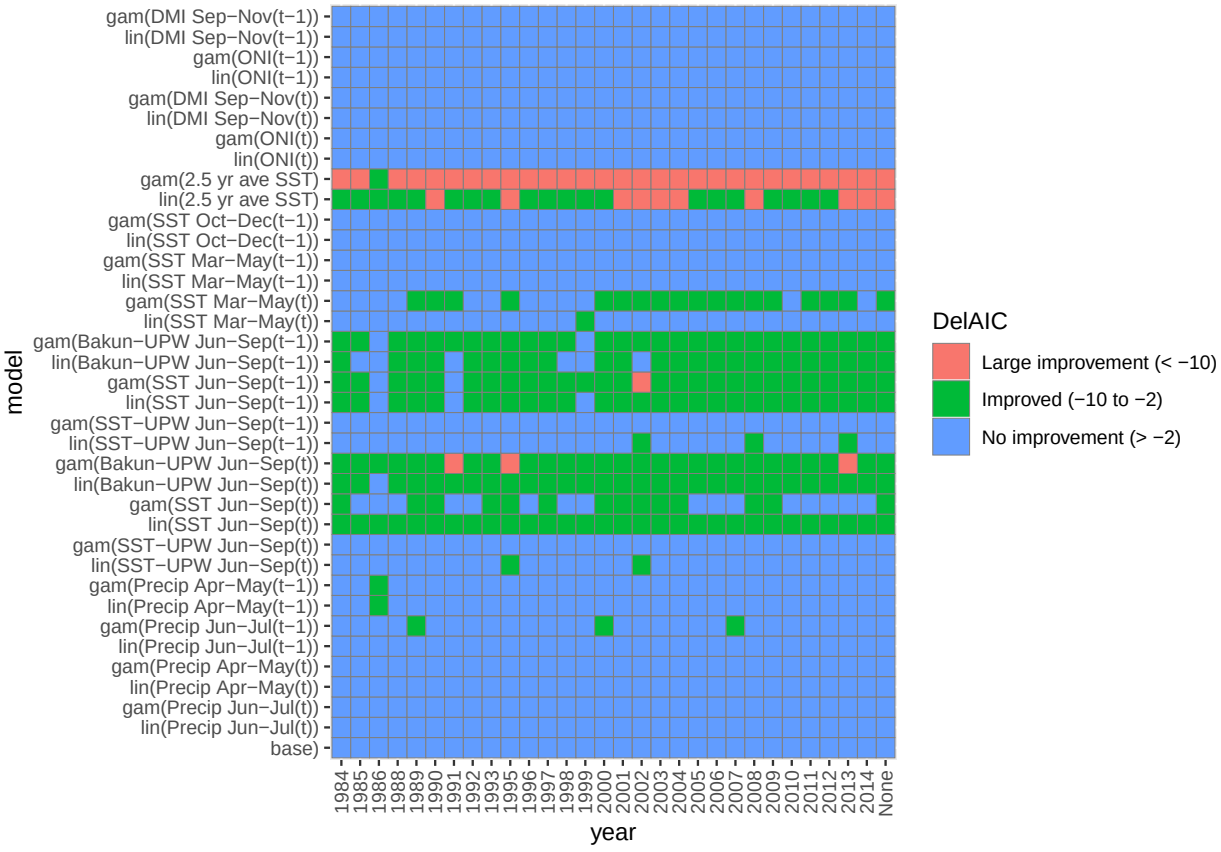
Figure 5D. R-squared for the Oct-Mar landings base models with 1987 and one additional year deleted. Deleted year is shown on the x-axis.

Figure 5D. R-squared for the Oct-Mar landings base models with 1987 and one additional year deleted. Deleted year is shown on the x-axis.

Validation of the Oct-Mar landings base models

The Figure 3D shows that for Oct-Mar landings the best model was always GAM with Oct-Mar in the prior season and Jul-Sep landings two seasons prior.

Again 1994 was deleted and the leave-one-out analysis was repeated. The Figure 4D shows the best model is still always GAM with Oct-Mar in the prior season and Jul-Sep landings two seasons prior.



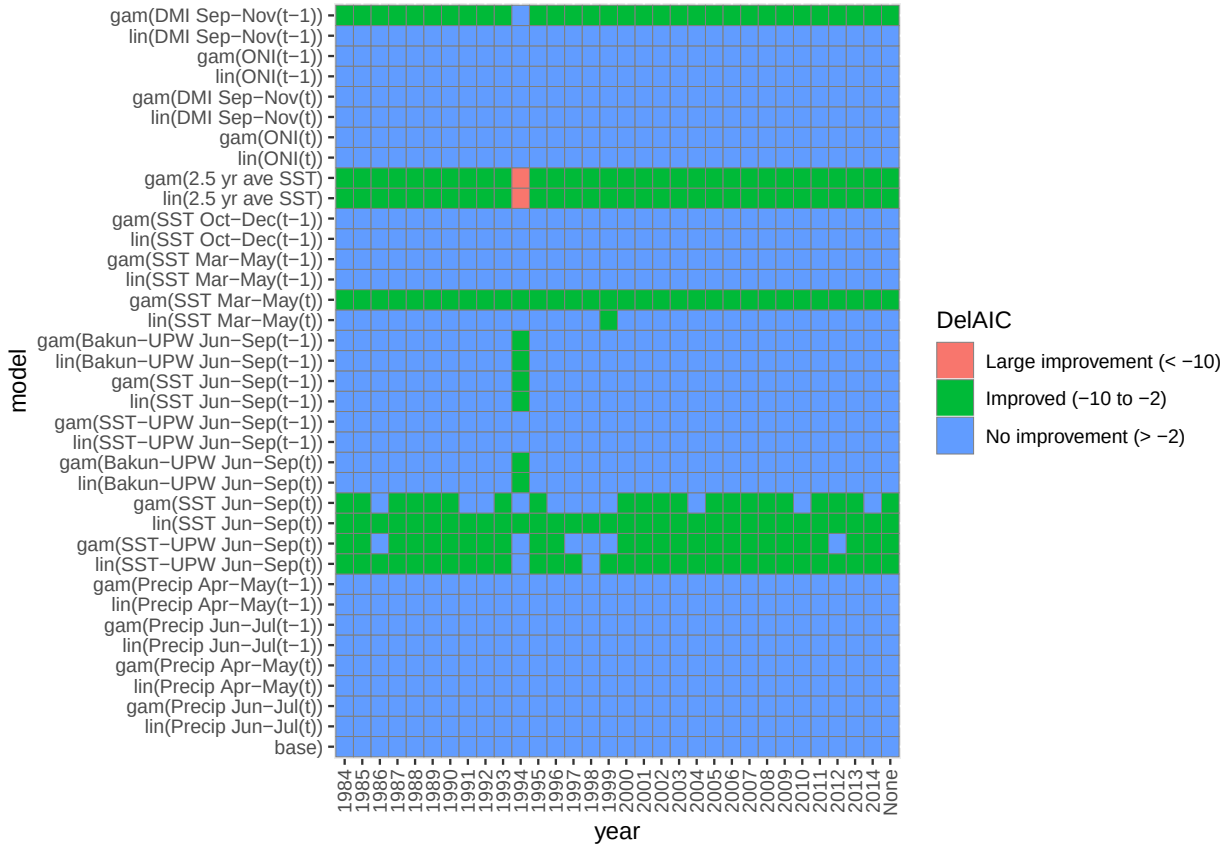


Figure 3D. Delta AIC for the Jul-Oct landings base models with one year deleted. Deleted year is shown on the x-axis.

model
gam(DMI Sep−Nov(t−1))
lin(DMI Sep−Nov(t−1))
gam(ONI(t−1))
lin(ONI(t−1))
gam(DMI Sep−Nov(t))
lin(DMI Sep−Nov(t))
gam(ONI(t))
lin(ONI(t))
gam(2.5 yr ave SST)
lin(2.5 yr ave SST)
gam(SST Oct−Dec(t−1))
lin(SST Oct−Dec(t−1))
gam(SST Mar−May(t−1))
lin(SST Mar−May(t−1))
gam(SST Mar−May(t))
lin(SST Mar−May(t))
gam(Bakun−UPW Jun−Sep(t−1))
lin(Bakun−UPW Jun−Sep(t−1))
gam(SST Jun−Sep(t−1))
lin(SST Jun−Sep(t−1))
gam(SST−UPW Jun−Sep(t−1))
lin(SST−UPW Jun−Sep(t−1))
gam(Bakun−UPW Jun−Sep(t))
lin(Bakun−UPW Jun−Sep(t))
gam(SST Jun−Sep(t))
lin(SST Jun−Sep(t))
gam(SST−UPW Jun−Sep(t))
lin(SST−UPW Jun−Sep(t))
gam(Precip Apr−May(t−1))
lin(Precip Apr−May(t−1))
gam(Precip Jun−Jul(t−1))
lin(Precip Jun−Jul(t−1))
gam(Precip Apr−May(t))
lin(Precip Apr−May(t))
gam(Precip Jun−Jul(t))
lin(Precip Jun−Jul(t))
base)
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
None
year
r2
(0.5,0.6]
(0.6,0.7]
(0.7,0.8]

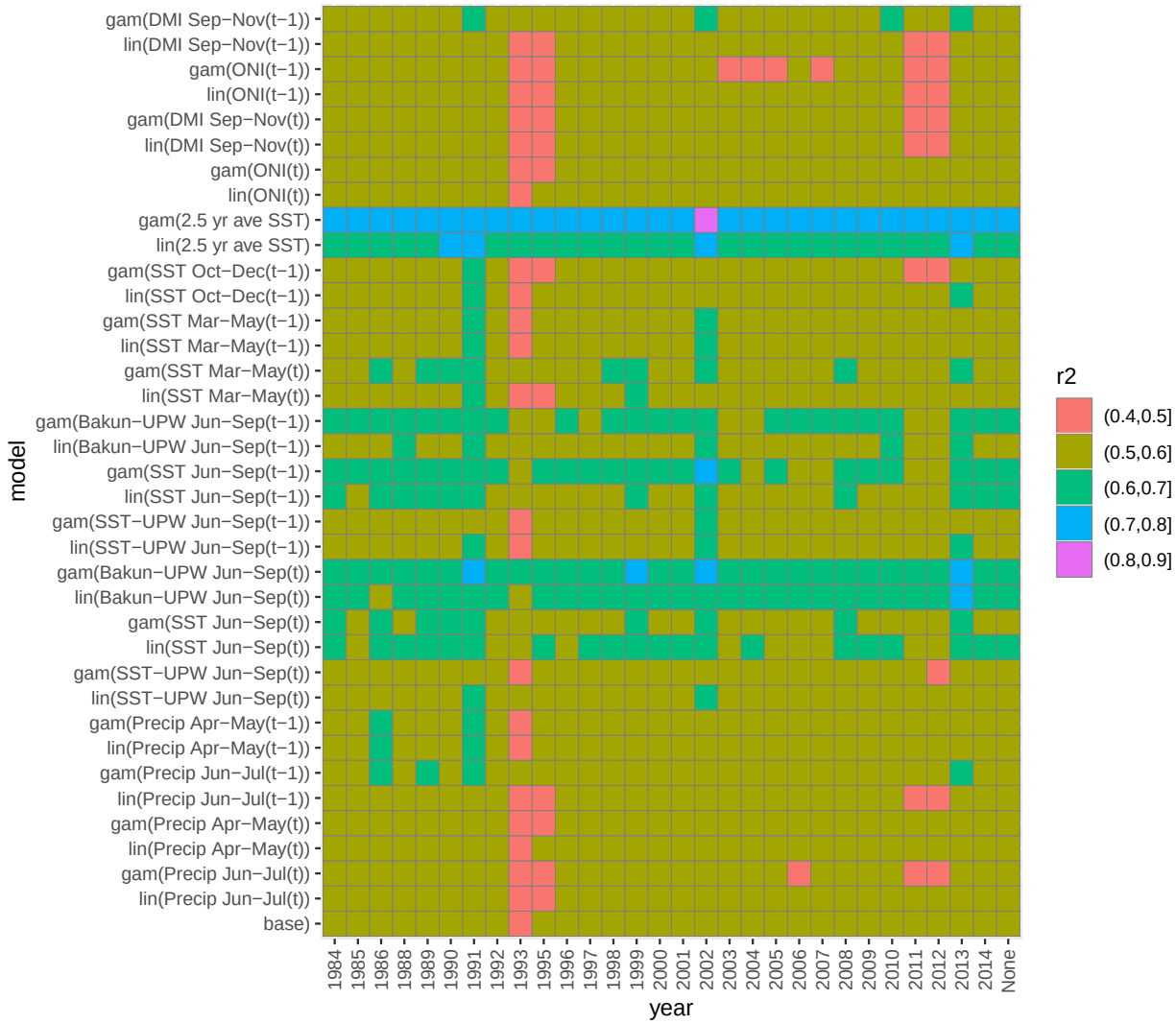


Figure 5D. R-squared for the Oct-Mar landings base models with 1994 and 1987 and one additional year deleted. Deleted year is shown on the x-axis.

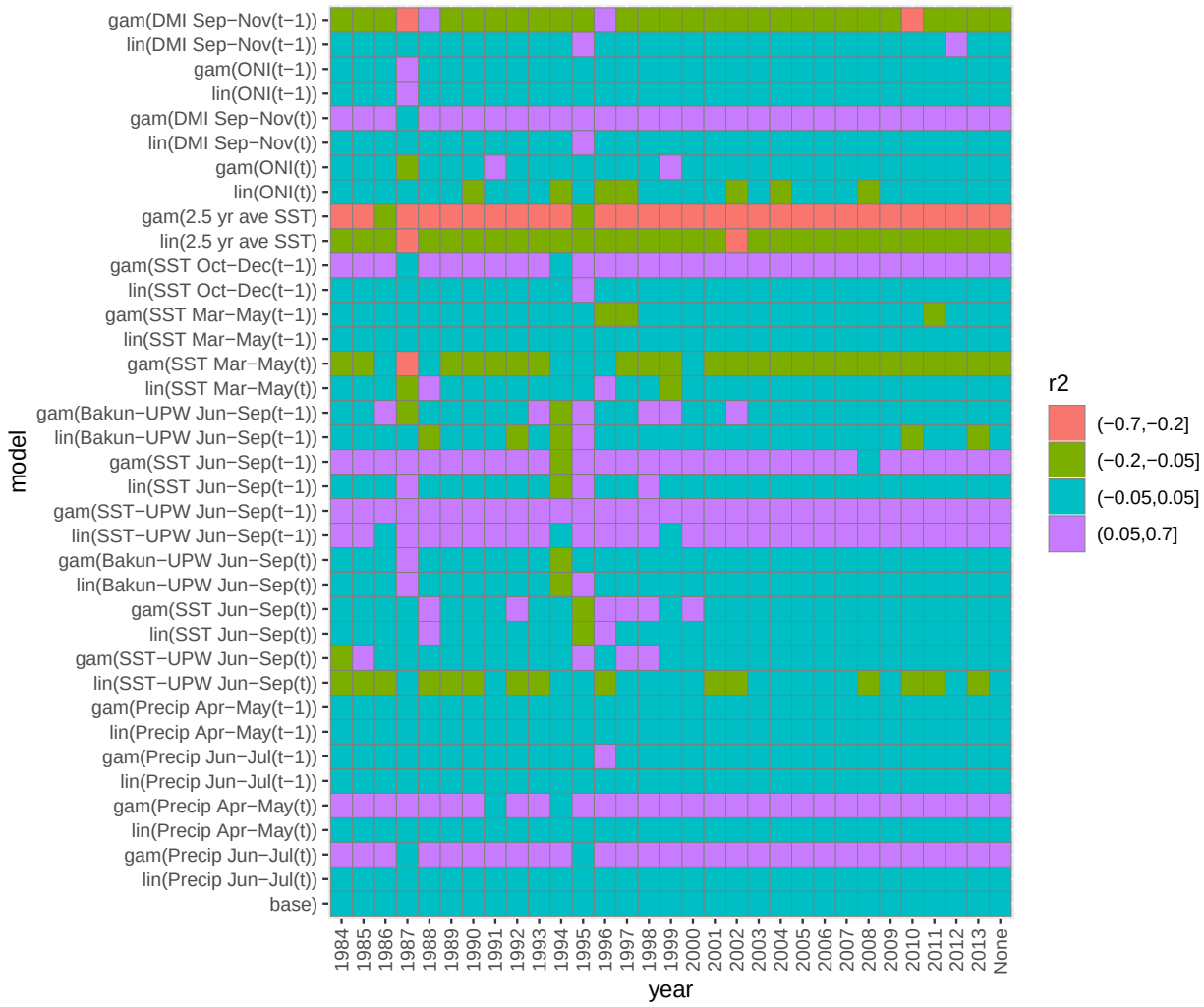


Figure 5D. R-squared for the Oct-Mar landings base models with 1994 and 1987 and one additional year deleted. Deleted year is shown on the x-axis.