Figures and Tables for CJFAS Short Communication

June 9, 2010

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[1] "Number of stocks used in the slope analyses"
[1] 207
[1] "Number of species used in the slope analyses"
[1] 108
[1] "Number of stocks per geographical region"

   Aust-NZ    HighSeas       NEAtl       NEPac NorthMidAtl       NWAtl
        28          14          46          64          14          36
      SAfr       SEPac
         4           1
[1] "Number of stocks with negative pre-1992 slope"
[1] 152
[1] "Number of stocks with negative pre-1992 slope and negative post-1992 slope (i.e. still decl
[1] 97
[1] "Number of stocks with negative pre-1992 slope and negative slope difference"
[1] 62
[1] "Number of stocks with negative pre-1992 slope and positive slope difference"
[1] 90
[1] "Number of stocks with negative pre-1992 slope, positive slope difference and negative post-
[1] 35
[1] "Number of pre-1992 negative (0) and pre-1992 positive (1) per region"

              0  1
  Aust-NZ    25  3
  HighSeas   11  3
  NEAtl      35 11
  NEPac      37 27
  NorthMidAtl 12  2
  NWAtl      28  8
  SAfr        4  0
  SEPac       0  1
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[1] "Number of stocks with BRP with negative pre-1992 slope"
[1] 136
[1] "Number of stocks with BRP with negative pre-1992 slope and negative post-1992 slope (i.e. s
[1] 84
[1] "Number of stocks with BRP with negative pre-1992 slope and negative slope difference"
[1] 52
[1] "Number of stocks with BRP with negative pre-1992 slope and positive slope difference"
[1] 84
[1] "Number of stocks with BRP with negative pre-1992 slope, positive slope difference and negat
[1] 32
[1] "Number of pre-1992 negative stocks with BRP from assessment"

yes  no
 85  51
[1] "1992 ratio for pre-1992 negative "

#808080   green orange1    red2
     16      52      42      42
[1] "1992 ratio for pre-1992 negative by type"

          yes no
  #808080   0  0
  green    46  6
  orange1  15 27
  red2     24 18
[1] "Number of stocks with 1992 ratio < 1 and pre-1992 negative"
[1] 84
[1] "Number of stocks with 1992 ratio < 1, pre-1992 negative and positive slope difference"
[1] 58
[1] "1992 ratio per region for pre-1992 negative "

              #808080 green orange1 red2
  Aust-NZ           0    20       4    1
  HighSeas          0     7       3    1
  NEAtl             5     1      17   12
  NEPac             4    17       8    8
  NorthMidAtl       2     3       2    5
  NWAtl             5     1       7   15
  SAfr              0     3       1    0
[1] "current ratio for pre-1992 negative "

#808080   green orange1    red2
     16      55      47      34
[1] "current ratio for pre-1992 negative by type"

```

```
           yes no
  #808080   0  0
  green    44 11
  orange1  26 21
  red2     15 19
[1] "current ratio per region for pre-1992 negative "

              #808080 green orange1 red2
  Aust-NZ           0    17       5    3
  HighSeas          0     6       4    1
  NEAtl             5     4      13   13
  NEPac             4    20      10    3
  NorthMidAtl       2     2       5    3
  NWAtl             5     3       9   11
  SAfr              0     3       1    0
[1] "Slope difference by region"

              negative positive
  Aust-NZ           13       12
  HighSeas           6        5
  NEAtl             13       22
  NEPac             20       17
  NorthMidAtl        2       10
  NWAtl              8       20
  SAfr               0        4
, ,  = negative


              #808080 green orange1 red2
  Aust-NZ           0     7       4    2
  HighSeas          0     3       2    1
  NEAtl             4     0       1    8
  NEPac             2     8       7    3
  NorthMidAtl       1     1       0    0
  NWAtl             3     0       1    4
  SAfr              0     0       0    0

, ,  = positive


              #808080 green orange1 red2
  Aust-NZ           0    10       1    1
  HighSeas          0     3       2    0
  NEAtl             1     4      12    5
  NEPac             2    12       3    0
```

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  NorthMidAtl       1     1       5    3
  NWAtl             2     3       8    7
  SAfr              0     3       1    0

[1] "pre-1992 negative, positive difference and post-1992 negative by region and ratio"

              #808080 green orange1 red2
  Aust-NZ           0     8       1    1
  HighSeas          0     3       1    0
  NEAtl             1     0       2    2
  NEPac             1     3       2    0
  NorthMidAtl       0     0       2    1
  NWAtl             1     0       1    4
  SAfr              0     1       0    0
[1] "pre-1992 negative, negative difference by region and ratio"

              #808080 green orange1 red2
  Aust-NZ           0     7       4    2
  HighSeas          0     3       2    1
  NEAtl             4     0       1    8
  NEPac             2     8       7    3
  NorthMidAtl       1     1       0    0
  NWAtl             3     0       1    4
[1] "Multi-species"
[1] "Number of stocks used in multi-species analysis"
[1] "174"
[1] "Overall percentage decline 1970-1974 to 2005-2009"
[1] "37.92"
[1] "Pelagic percentage decline 1970-1974 to 2005-2009"
[1] "27.92"
[1] "Demersal percentage decline 1970-1974 to 2005-2009"
[1] "40.54"
[1] "Number of stocks used in multi-species analysis with BRP"
[1] 159
[1] "Overall decline 1970-1974 to 2005-2009, with BRP"
[1] "37.97"
[1] "1.28"
[1] "0.79"
[1] "Pelagic decline 1970-1974 to 2005-2009, with BRP"
[1] "36.74"
[1] "1.18"
[1] "0.75"
[1] "Demersal decline 1970-1974 to 2005-2009, with BRP"
[1] "38.32"
[1] "1.3"
```

```
[1] "0.8"
[1] "Demersal decline by region, with BRP"
[1] "NWAtl"
[1] "44.14"
[1] "0.61"
[1] "0.34"
[1] "NEAtl"
[1] "45.86"
[1] "0.88"
[1] "0.47"
[1] "NorthMidAtl"
[1] "66.58"
[1] "1.4"
[1] "0.47"
[1] "Aust-NZ"
[1] "58.6"
[1] "2.7"
[1] "1.12"
```

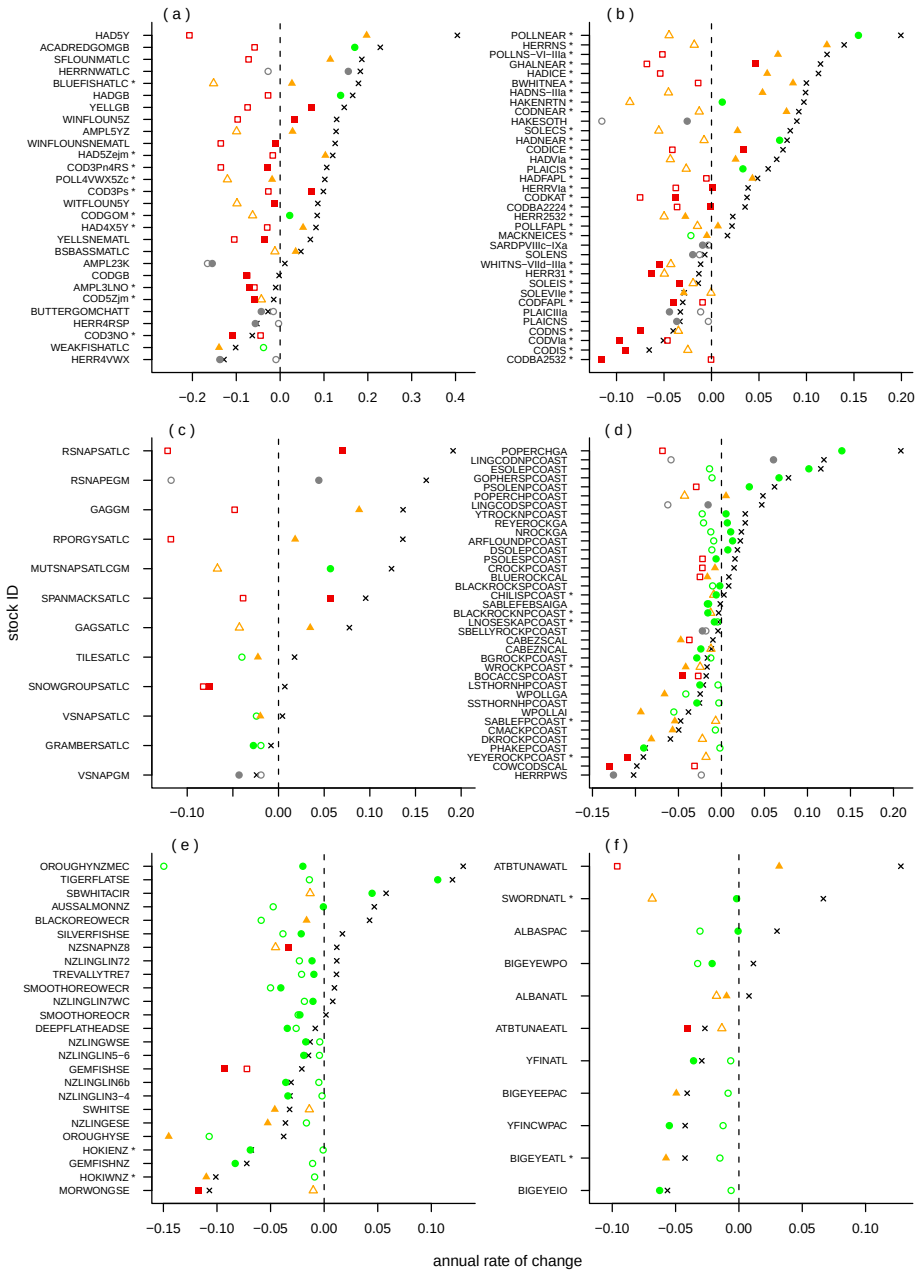
(a)
HAD5Y
ACADREDGOMGB
SFLOUNMATLC
HERRNWATLC
BLUEFISHATLC *
HADGB
YELLGB
WINFLOUN5Z
AMPL5YZ
WINFLOUNSNEMATL
HAD5Zejm *
COD3Pn4RS *
POLL4VWX5Zc *
COD3Ps *
WITFLOUN5Y
CODGOM *
HAD4X5Y *
YELLSNEMATL
BSBASSMATLC
AMPL23K
CODGB
AMPL3LNO *
COD5Zjm *
BUTTERGOMCHATT
HERR4RSP
COD3NO *
WEAKFISHATLC
HERR4VWX
−0.2 −0.1 0.0 0.1 0.2 0.3 0.4
(b)
POLLNEAR *
HERRNS *
POLLNS−VI−IIIa *
GHALNEAR *
HADICE *
BWHITNEA *
HADNS−IIIa *
HAKENRTN *
CODNEAR *
HAKE5OTH
SOLECS *
HADNEAR *
CODICE *
HADVIa *
PLAICIS *
HADFAPL *
HERRVIa *
CODKAT *
CODBA2224 *
HERR2532 *
POLLFAPL *
MACKNEICES *
SARDPVIIIc−IXa
SOLENS
WHITNS−VIId−IIIa *
HERR31 *
SOLEIS *
SOLEVIIe *
CODFAPL *
PLAICIIIa
PLAICNS
CODNS *
CODVIa *
CODIS *
CODBA2532 *
−0.10 −0.05 0.00 0.05 0.10 0.15 0.20
(c)
stock ID
RSNAPSATLC
RSNAPEGM
GAGGM
RPORGYSATLC
MUTSNAPSATLCGM
SPANMACKSATLC
GAGSATLC
TILESATLC
SNOWGROUPSATLC
VSNAPSATLC
GRAMBERSATLC
VSNAPGM
−0.10 0.00 0.05 0.10 0.15 0.20
(d)
POPERCHGA
LINGCODNPCOAST
ESOLEPCOAST
GOPHERSPCOAST
PSOLENPCOAST
POPERCHPCOAST
LINGCODSPCOAST
YTROCKNPCOAST
REYEROCKGA
NROCKGA
ARFLOUNDPCOAST
DSOLEPCOAST
PSOLESPCOAST
CROCKPCOAST
BLUEROCKCAL
BLACKROCKSPCOAST
CHILISPCOAST *
SABLEFEBSAIGA
BLACKROCKNPCOAST *
LNOSESKAPCOAST *
SBELLYROCKPCOAST
CABEZSCAL
CABEZNCAL
BGROCKPCOAST
WROCKPCOAST *
BOCACCSPCOAST
LSTHORNHPCOAST
WPOLLGA
SSTHORNHPCOAST
WPOLLAI
SABLEFPCOAST *
CMACKPCOAST
DKROCKPCOAST
PHAKEPCOAST
YEYEROCKPCOAST *
COWCODSCAL
HERRPWS
−0.15 −0.05 0.00 0.05 0.10 0.15 0.20
(e)
OROUGHYNZMEC
TIGERFLATSE
SBWHITACIR
AUSSALMONNZ
BLACKOREOWECR
SILVERFISHSE
NZSNAPNZ8
NZLINGLIN72
TREVALLYTRE7
SMOOTHOREOWECR
NZLINGLIN7WC
SMOOTHOREOCR
DEEPFLATHEADSE
NZLINGWSE
NZLINGLIN5−6
GEMFISHSE
NZLINGLIN6b
NZLINGLIN3−4
SWHITSE
NZLINGESE
OROUGHYSE
HOKIENZ *
GEMFISHNZ
HOKIWNZ *
MORWONGSE
−0.15 −0.10 −0.05 0.00 0.05 0.10
(f)
ATBTUNAWATL
SWORDNATL *
ALBASPAC
BIGEYEWPO
ALBANATL
ATBTUNAEATL
YFINATL
BIGEYEEPAC
YFINCWPAC
BIGEYEATL *
BIGEYEIO
−0.10 −0.05 0.00 0.05 0.10
annual rate of change

Figure 1

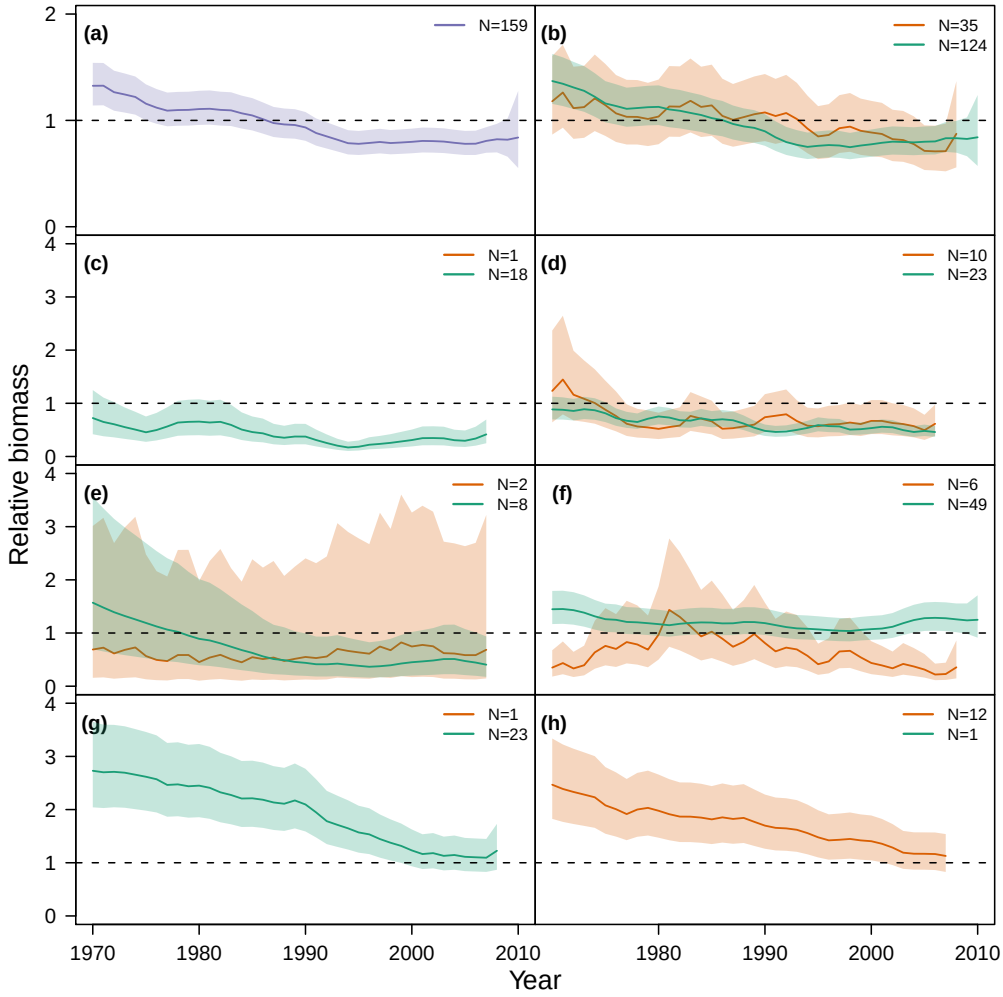
(a)
N=159
(b)
N=35
N=124
(c)
N=1
N=18
(d)
N=10
N=23
(e)
N=2
N=8
(f)
N=6
N=49
(g)
N=1
N=23
(h)
N=12
N=1
Relative biomass
Year
1970
1980
1990
2000
2010

Figure 2

Temporal Trends in Abundance: Alternative Model Fits

In addition to the continuous piece-wise model described in the main body of the paper to compare regression slopes before and after 1992, we fit two other models to evaluate the robustness of our results. The first was a less biologically realistic, discontinuous piece-wise model with no continuity constraint

$$ln\left(SSB_t\right) = \alpha + \delta_\alpha \eta_t + \left(\beta + \delta_\beta \eta_t\right) t + \epsilon_t \tag{1}$$

where δ_α is the change in intercept post-1992. The equations used for the continuous and discontinuous piece-wise models assume independence and that variability around the mean arises from measurement error. Thus, for comparison, we also fit a random-walk state-space model (Durbin and Koopman 2001) with pre- and post-1992 drift terms via a Kalman filter with measurement and process error estimation attempted:

$$ln\left(SSB_{obs,t}\right) = ln\left(SSB_{true,t}\right) + \nu_t \tag{2}$$

$$ln\left(SSB_{true,t+1}\right) = ln\left(SSB_{true,t}\right) + \beta + \delta_\beta \eta_t + \zeta_t \tag{3}$$

where $SSB_{obs,t}$ the assessment-derived spawning stock biomass in year t, $SSB_{true,t+1}$ is the estimate of the true state of the spawning stock biomass, and ν_t and ζ_t are the normally distributed measurement and process errors, respectively. The equations for all three models use the same parameter symbols for continuity but each will have a model-specific interpretation. The random-walk state-space model consistently yielded estimates of low to absent measurement error variability. This had the effect of reducing the model to a process-variance model where the model fit often, but not always, conformed closely with the observed data. The near absence of measurement error variability can be attributed to either the low-frequency nature of the time series, which presumably resulted from the assessments being aggregated across multiple ages and cohorts, thus producing a relatively smooth biomass series where the error variances are difficult to separate, or the relative simplicity of the implemented state space model (Equation 3).

Stock ID	Area	Common name	Scientific name	Category	type	ratio 1992	ratio current	Continuous		Discontinuous		Drift	
								pre-1992	post-1992	pre-1992	post-1992	pre-1992	post-1992
ACADREDGOMGB	Gulf of Maine / Georges Bank	Acadian redfish	*Sebastes fasciatus*	Demersal		0.3700	8.6600	-0.0582	0.1702	-0.0556	0.2303	-0.0535	0.2109
ALBANATL	Northern Atlantic	Albacore tuna	*Thunnus alalunga*	Pelagic		0.9300	0.8100	-0.0177	-0.0097	-0.0185	-0.0244	-0.0156	-0.0144
ALBASPAC	South Pacific Ocean	Albacore tuna	*Thunnus alalunga*	Pelagic		4.0100	2.4600	-0.0307	-0.0007	-0.0373	-0.0295	-0.0337	-0.0349
ALPLAICBSAI	Bering Sea and Aleutian Islands	Alaska plaice	*Pleuronectes quadrituberculatus*	Demersal		2.7100	2.4600	0.0233	-0.0322	0.0458	-0.0123	0.0324	-0.0060
AMPL23K	Labrador - NE Newfoundland	American plaice	*Hippoglossoides platessoides*	Demersal				-0.1657	-0.1548	-0.0588	-0.0479	-0.1073	-0.1470
AMPL3LNO	Grand Banks	American plaice	*Hippoglossoides platessoides*	Demersal	*	0.1400	0.0800	-0.0587	-0.0688	-0.0222	0.0640	-0.0524	0.0187
AMPL5YZ	Gulf of Maine / Georges Bank	American plaice	*Hippoglossoides platessoides*	Demersal		0.5200	0.7000	-0.0993	0.0283	-0.1398	0.0087	-0.0809	0.0202
ARFLOUNDBSAI	Bering Sea and Aleutian Islands	Arrowtooth flounder	*Reinhardtius stomias*	Demersal		1.3100	2.7000	0.0628	0.0463	0.0524	0.0381	0.0592	0.0451
ARFLOUNDGA	Gulf of Alaska	Arrowtooth flounder	*Reinhardtius stomias*	Demersal		1.9300	3.0200	0.0521	0.0257	0.0508	0.0225	0.0467	0.0249
ARFLOUNDPCOAST	Pacific Coast	Arrowtooth flounder	*Reinhardtius stomias*	Demersal		3.1100	3.8100	-0.0090	0.0129	-0.0095	0.0027	-0.0059	0.0136
ATBTUNAEATL	Eastern Atlantic	Atlantic bluefin tuna	*Thunnus thynnus*	Pelagic		0.6200	0.3400	-0.0135	-0.0403	-0.0221	-0.0550	-0.0173	-0.0621
ATBTUNAWATL	Western Atlantic	Atlantic bluefin tuna	*Thunnus thynnus*	Pelagic		0.4300	0.5700	-0.0961	0.0318	-0.1085	0.0106	-0.0918	0.0193
ATKABSAI	Bering Sea and Aleutian Islands	Atka mackerel	*Pleurogrammus monopterygius*	Demersal		2.2300	1.5500	0.0272	0.0026	0.0189	-0.0025	0.0648	-0.0215
ATLCROAKMATLC	Mid-Atlantic Coast	Atlantic croaker	*Micropogonias undulatus*	Demersal		1.3000	1.4200	0.0782	0.0306	0.0677	0.0034	0.0952	0.0092
AUSSALMONNZ	New Zealand	Australian salmon	*Arripis trutta*	Pelagic		1.8400	1.6400	-0.0475	-0.0007	-0.0541	-0.0082	-0.0440	-0.0080
BGROCKPCOAST	Pacific Coast	Blackgill rockfish	*Sebastes melanostomus*	Demersal		1.4300	1.3100	-0.0124	-0.0287	-0.0093	-0.0034	-0.0136	-0.0070
BIGEYEATL	Atlantic	Bigeye tuna	*Thunnus obesus*	Pelagic	*	1.4100	0.9000	-0.0150	-0.0576	0.0018	-0.0358	-0.0049	-0.0274
BIGEYEEPAC	Eastern Pacific	Bigeye tuna	*Thunnus obesus*	Pelagic		1.7400	0.9000	-0.0086	-0.0494	-0.0010	-0.0419	-0.0074	-0.0439
BIGEYEIO	Indian Ocean	Bigeye tuna	*Thunnus obesus*	Pelagic		2.2900	1.2300	-0.0062	-0.0626	-0.0049	-0.0558	-0.0114	-0.0518
BIGEYEWPO	Western Pacific Ocean	Bigeye tuna	*Thunnus obesus*	Pelagic		1.8700	1.0600	-0.0326	-0.0212	-0.0352	-0.0384	-0.0287	-0.0407
BIGHTREDSE	Southeast Australia	Bight redfish	*Centroberyx gerrardi*	Demersal		1.3400	0.9500	0.0056	-0.0170	0.0038	-0.0242	0.0047	-0.0234
BLACKOREOWECR	West end of Chatham Rise	Black oreo	*Allocyttus niger*	Demersal		1.2500	0.9900	-0.0588	-0.0164	-0.0581	-0.0156	-0.0513	-0.0158
BLACKROCKNPCOAST	Northern Pacific Coast	Black rockfish	*Sebastes melanops*	Demersal	*	0.9800	1.3700	-0.0126	-0.0158	-0.0095	0.0586	-0.0167	0.0458

Continued on next page

Stock ID	Area	Common name	Scientific name	Category	type	ratio 1992	ratio current	Continuous		Discontinuous		Drift	
								pre-1992	post-1992	pre-1992	post-1992	pre-1992	post-1992
BLACKROCKSPCOAST	Southern Pacific Coast	Black rockfish	*Sebastes melanops*	Demersal		1.2100	2.2300	-0.0103	-0.0019	-0.0078	0.0528		
BLUEFISHATLC	Atlantic Coast	Bluefish	*Pomatomus saltatrix*	Demersal	*	0.5600	0.8100	-0.1517	0.0269	-0.1415	0.0303	-0.1314	0.0212
BLUEROCKCAL	California	Blue rockfish	*Sebastes mystinus*	Demersal		0.3300	0.7500	-0.0250	-0.0164	-0.0204	0.0802	-0.0270	0.0544
BOCACCSPCOAST	Southern Pacific Coast	Bocaccio	*Sebastes paucispinis*	Demersal		0.1800	0.3200	-0.0270	-0.0448	-0.0143	0.0425	-0.0328	0.0421
BSBASSMATLC	Mid-Atlantic Coast	Black sea bass	*Centropristis striata*	Demersal		0.5600	0.9200	-0.0119	0.0354	-0.0045	0.0505	0.0051	0.0331
BUTTERGOMCHATT	Gulf of Maine / Cape Hatteras	Atlantic butterfish	*Peprilus triacanthus*	Demersal				-0.0154	-0.0430	-0.0087	-0.0149	-0.0578	-0.0034
BWHITNEA	Northeast Atlantic	Blue whiting	*Micromesistius poutassou*	Demersal	*	0.3400	0.6700	-0.0141	0.0858	-0.0363	0.0768	0.0073	0.0351
CABEZNCAL	Northern California	Cabezon	*Scorpaenichthys marmoratus*	Demersal		0.7700	1.0400	-0.0122	-0.0240	-0.0103	0.0283	-0.0162	0.0231
CABEZSCAL	Southern California	Cabezon	*Scorpaenichthys marmoratus*	Demersal		0.3500	0.7400	-0.0374	-0.0473	-0.0335	0.0178	-0.0340	0.0573
CAPEICE	Iceland Grounds	Capelin	*Mallotus villosus*	Pelagic	*	0.8500	0.4900	0.0341	0.0094	0.0099	-0.0089	0.0367	0.0081
CAPENOR	Barents Sea	Capelin	*Mallotus villosus*	Pelagic	*	1.0300	0.1700	0.0585	0.0301	0.0571	0.0089		
CHAKESA	South Africa	Shallow-water cape hake	*Merluccius capensis*	Demersal		3.0400	2.3000	-0.0068	0.0034	-0.0085	-0.0280		
CHILISPCOAST	Southern Pacific Coast	Chilipepper rockfish	*Sebastes goodei*	Demersal	*	0.8900	1.4300	-0.0090	-0.0062	-0.0072	0.0624	-0.0109	0.0500
CHTRACCH	Chilean EEZ and offshore	Chilean jack mackerel	*Trachurus murphyi*	Pelagic	*	1.1200	0.5200	0.1135	-0.0963	0.1703	-0.0395	0.1276	-0.0674
CMACKPCOAST	Pacific Coast	Chub mackerel	*Scomber japonicus*	Pelagic		1.0400	0.6800	-0.0071	-0.0568	-0.0088	-0.0786	-0.0332	-0.0265
COD3NO	Southern Grand Banks	Atlantic cod	*Gadus morhua*	Demersal	*	0.0500	0.0200	-0.0446	-0.1081	-0.0161	0.0024	-0.0495	-0.0386
COD3Pn4RS	Northern Gulf of St. Lawrence	Atlantic cod	*Gadus morhua*	Demersal	*	0.1200	0.0900	-0.1353	-0.0290	-0.0611	0.0545	-0.1010	0.0176
COD3Ps	St. Pierre Bank	Atlantic cod	*Gadus morhua*	Demersal	*	0.2900	0.4900	-0.0269	0.0717	0.0145	0.1195	0.0037	0.0853
COD4TVn	Southern Gulf of St. Lawrence	Atlantic cod	*Gadus morhua*	Demersal	*	0.3100	0.1700	0.0022	-0.0857	0.0392	-0.0286	-0.0253	-0.0335
COD4VsW	Eastern Scotian Shelf	Atlantic cod	*Gadus morhua*	Demersal				0.0050	-0.2548	0.0379	-0.1399	-0.0148	-0.1734
COD5Zjm	Georges Bank	Atlantic cod	*Gadus morhua*	Demersal	*	0.6100	0.3400	-0.0428	-0.0574	0.0036	-0.0032	-0.0202	-0.0521
CODBA2224	Western Baltic	Atlantic cod	*Gadus morhua*	Demersal	*	0.3700	0.3600	-0.0362	-0.0009	-0.0365	-0.0014	-0.0706	0.0535
CODBA2532	Eastern Baltic	Atlantic cod	*Gadus morhua*	Demersal	*	0.1300	0.1600	-0.0005	-0.1159	0.0221	-0.0546	-0.0362	-0.0093
CODFAPL	Faroe Plateau	Atlantic cod	*Gadus morhua*	Demersal	*	0.3600	0.2600	-0.0094	-0.0397	-0.0076	-0.0325	-0.0248	-0.0101
CODGB	Georges Bank	Atlantic cod	*Gadus morhua*	Demersal		0.2500	0.1200	-0.0753	-0.0776	-0.0326	-0.0490	-0.0632	-0.0503
CODGOM	Gulf of Maine	Atlantic cod	*Gadus morhua*	Demersal	*	0.6500	1.4600	-0.0628	0.0218	0.0095	0.0458	-0.0540	0.0693
CODICE	Iceland Grounds	Atlantic cod	*Gadus morhua*	Demersal	*	0.3700	0.4600	-0.0412	0.0340	-0.0432	0.0231	-0.0406	0.0144
CODIS	Irish Sea	Atlantic cod	*Gadus morhua*	Demersal	*	0.5200	0.1500	-0.0249	-0.0905	-0.0114	-0.0595	-0.0231	-0.0737
CODKAT	Kattegat and Skagerrak	Atlantic cod	*Gadus morhua*	Demersal	*	0.2600	0.1900	-0.0752	-0.0378	-0.0973	-0.0765	-0.0781	-0.0329

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								Continuous		Discontinuous		Drift	
Stock ID	Area	Common name	Scientific name	Category	type	ratio 1992	ratio current	pre-1992	post-1992	pre-1992	post-1992	pre-1992	post-1992
CODNEAR	North-East Arctic	Atlantic cod	*Gadus morhua*	Demersal	*	0.7300	0.5600	-0.0129	0.0790	-0.0244	-0.0203	-0.0060	-0.0291
CODNS	North Sea	Atlantic cod	*Gadus morhua*	Demersal	*	0.5100	0.1900	-0.0348	-0.0752	-0.0352	-0.0762	-0.0281	-0.0442
CODVIa	West of Scotland	Atlantic cod	*Gadus morhua*	Demersal	*	0.3500	0.1200	-0.0464	-0.0970	-0.0541	-0.1028	-0.0632	-0.0910
COWCODSCAL	Southern California	Cowcod	*Sebastes levis*	Demersal		0.0500	0.0900	-0.0313	-0.1297	-0.0257	0.0448	-0.0430	0.0420
CROCKPCOAST	Pacific Coast	Canary rockfish	*Sebastes pinniger*	Demersal		0.4000	0.8500	-0.0222	-0.0076	-0.0187	0.0663	-0.0251	0.0506
CTRACSA	South Africa South coast	Cape horse mackerel	*Trachurus capensis*	Pelagic	*	1.3000	1.4700	-0.0003	0.0127	-0.0016	0.0047	-0.0127	0.0091
DEEPCHAKESA	South Africa	Deep-water cape hake	*Merluccius paradoxus*	Demersal		0.8100	0.8300	-0.0369	0.0222	-0.0388	-0.0135	-0.0263	0.0013
DEEPFLATHEADSE	Southeast Australia	Deepwater flathead	*Platycephalus conatus*	Demersal		2.0700	1.5100	-0.0261	-0.0344	-0.0194	-0.0299	-0.0201	-0.0212
DKROCKPCOAST	Pacific Coast	Darkblotched rockfish	*Sebastes crameri*	Demersal		0.7100	0.7300	-0.0222	-0.0815	-0.0171	-0.0062	-0.0243	0.0021
DSOLEPCOAST	Pacific Coast	Dover sole	*Microstomus pacificus*	Demersal		1.0600	1.6100	-0.0112	0.0074	-0.0103	0.0357	-0.0108	0.0320
DUSROCKGA	Gulf of Alaska	Dusky rockfish	*Sebastes variabilis*	Demersal		0.8900	1.5400	0.0484	0.0400	0.0461	0.0383	0.0429	0.0364
ESOLEPCOAST	Pacific Coast	English sole	*Parophrys vetulus*	Demersal		1.2400	6.4200	-0.0139	0.1017	-0.0132	0.1333	-0.0130	0.1095
FLSOLEBSAI	Bering Sea and Aleutian Islands	Flathead sole	*Hippoglossoides elassodon*	Demersal		1.8300	1.8300	0.2020	-0.0112	0.2068	-0.0079	0.1779	-0.0000
GAGGM	Gulf of Mexico	Gag	*Mycteroperca microlepis*	Demersal		0.4400	1.0000	-0.0481	0.0883	-0.0494	0.0825	-0.0518	0.0687
GAGSATLC	Southern Atlantic coast	Gag	*Mycteroperca microlepis*	Demersal		0.6000	0.9400	-0.0429	0.0347	-0.0455	0.0239	-0.0382	0.0349
GEMFISHNZ	New Zealand	common gemfish	*Rexea solandri*	Demersal		4.7800	1.6400	-0.0108	-0.0830	-0.0124	-0.0936	-0.0072	-0.0766
GEMFISHSE	Southeast Australia	common gemfish	*Rexea solandri*	Demersal		0.3800	0.2500	-0.0721	-0.0929	-0.0529	-0.0471	-0.0678	-0.0288
GHAL23KLMNO	Labrador Shelf - Grand Banks	Greenland halibut	*Reinhardtius hippoglossoides*	Demersal	*	0.9900	0.3900	0.0512	-0.1551	0.0582	-0.1472	0.0707	-0.1674
GHALBSAI	Bering Sea and Aleutian Islands	Greenland halibut	*Reinhardtius hippoglossoides*	Demersal		5.1800	1.4800	0.0177	-0.1247	0.0319	-0.0835	0.0142	-0.0739
GHALNEAR	North-East Arctic	Greenland halibut	*Reinhardtius hippoglossoides*	Demersal	*	0.1400	0.3600	-0.0681	0.0467	-0.0558	0.0854	-0.0537	0.0564
GOPHERSPCOAST	Southern Pacific Coast	Gopher rockfish	*Sebastes carnatus*	Demersal		1.8700	2.3800	-0.0110	0.0669	-0.0194	0.0388	-0.0084	0.0186
GRAMBERSATLC	Southern Atlantic coast	Greater amberjack	*Seriola dumerili*	Demersal		1.2400	1.1000	-0.0193	-0.0275	-0.0153	0.0067	-0.0214	-0.0086
GTRIGGM	Gulf of Mexico	Gray triggerfish	*Balistes capriscus*	Demersal		2.1300	1.1200	0.0033	-0.0501	0.0184	-0.0411	0.0141	-0.0540

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Stock ID	Area	Common name	Scientific name	Category	type	ratio 1992	ratio current	Continuous		Discontinuous		Drift	
								pre-1992	post-1992	pre-1992	post-1992	pre-1992	post-1992
HAD4X5Y	Western Scotian Shelf, Bay of Fundy and Gulf of Maine	Haddock	*Melanogrammus aeglefinus*	Demersal	*	0.4100	0.8500	-0.0294	0.0524	-0.0223	0.0733	-0.0164	0.0684
HAD5Y	Gulf of Maine	Haddock	*Melanogrammus aeglefinus*	Demersal		0.1500	0.9900	-0.2069	0.1973	-0.2653	0.1522	-0.1924	0.1251
HAD5Zejm	Georges Bank	Haddock	*Melanogrammus aeglefinus*	Demersal	*	0.2500	1.0000	-0.0168	0.1031	0.0029	0.1670	-0.0293	0.1599
HADFAPL	Faroe Plateau	Haddock	*Melanogrammus aeglefinus*	Demersal	*	0.3100	0.8500	-0.0054	0.0431	0.0068	0.1035	-0.0184	0.0685
HADGB	Georges Bank	Haddock	*Melanogrammus aeglefinus*	Demersal		0.1000	1.9900	-0.0275	0.1379	-0.0234	0.1929	-0.0286	0.1966
HADICE	Iceland Grounds	Haddock	*Melanogrammus aeglefinus*	Demersal	*	0.3500	0.9800	-0.0540	0.0587	-0.0387	0.0674	-0.0467	0.0589
HADNEAR	North-East Arctic	Haddock	*Melanogrammus aeglefinus*	Demersal	*	0.6100	1.1000	-0.0078	0.0717	-0.0135	0.0311	0.0061	0.0421
HADNS-IIIa	IIIa and North Sea	Haddock	*Melanogrammus aeglefinus*	Demersal	*	0.8000	0.6200	-0.0453	0.0537	-0.0461	0.0513	-0.0510	0.0368
HADVIa	West of Scotland	Haddock	*Melanogrammus aeglefinus*	Demersal	*	0.8200	0.5800	-0.0433	0.0253	-0.0453	0.0239	-0.0452	0.0262
HAKENRTN	IIIa-IV-VI-VII-VIIIabd	Hake	*Merluccius merluccius*	Demersal	*	0.7100	1.0400	-0.0860	0.0113	-0.0589	0.0268	-0.0679	0.0292
HAKESOTH	VIIIc-IXa	Hake	*Merluccius merluccius*	Demersal				-0.1155	-0.0256	-0.1067	-0.0227	-0.0949	-0.0250
HERR2532	Eastern Baltic	Herring	*Clupea harengus*	Pelagic	*	0.6900	0.6900	-0.0499	-0.0275	-0.0393	-0.0140	-0.0372	0.0032
HERR30	Bothnian Sea	Herring	*Clupea harengus*	Pelagic	*	1.4700	1.1900	0.0589	0.0028	0.0469	-0.0144	0.0540	-0.0142
HERR31	Bothnian Bay	Herring	*Clupea harengus*	Pelagic	*	0.6500	0.2900	-0.0497	-0.0629	-0.0010	-0.0362	-0.0097	-0.0615
HERR4RFA	NAFO 4R	Herring	*Clupea harengus*	Pelagic				0.0080	-0.0273	0.0064	-0.0308	-0.0107	-0.0263
HERR4RSP	NAFO 4R	Herring	*Clupea harengus*	Pelagic				-0.0036	-0.0566	0.0153	0.0162	0.0039	-0.0101
HERR4VWX	Scotian Shelf and Bay of Fundy	Herring	*Clupea harengus*	Pelagic				-0.0095	-0.1375	0.0045	-0.0965	-0.0139	-0.1290
HERRCC	Central Coast	Pacific herring	*Clupea pallasii*	Pelagic	*	1.2500	0.3000	0.0220	-0.0456	0.0197	-0.0598	0.0125	-0.0590
HERRNIRS	Irish Sea	Herring	*Clupea harengus*	Pelagic	*	0.2400	0.7200	0.0102	-0.0734	0.0229	-0.0242	0.0292	0.0252
HERRNS	North Sea	Herring	*Clupea harengus*	Pelagic	*	0.6900	0.6500	-0.0182	0.1215	-0.0234	0.0999	-0.0275	0.0384
HERRNWATLC	Northwestern Atlantic Coast	Herring	*Clupea harengus*	Pelagic				-0.0274	0.1555	-0.0683	0.0386	-0.0282	0.0387
HERRPRD	Prince Rupert District	Pacific herring	*Clupea pallasii*	Pelagic	*	0.3900	0.1600	0.0037	-0.0118	0.0025	-0.0195	0.0077	-0.0349
HERRPWS	Prince William Sound	Pacific herring	*Clupea pallasii*	Pelagic				-0.0234	-0.1256	0.0597	-0.0799	0.0410	-0.1524

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								pre-1992	post-1992	pre-1992	post-1992	pre-1992	post-1992
HERRQCI	Queen Charlotte Islands	Pacific herring	*Clupea pallasii*	Pelagic	*	0.3600	0.2000	0.0358	-0.1062	0.0457	-0.0468	0.0183	-0.0361
HERRRIGA	Gulf of Riga East of Gotland	Herring	*Clupea harengus*	Pelagic	*	1.3700	1.2100	0.0587	-0.0060	0.0390	-0.0212	0.0536	-0.0108
HERRSITKA	Sitka	Pacific herring	*Clupea pallasii*	Pelagic				0.0401	0.0495	0.0672	0.0677	0.0712	0.0273
HERRSOG	Straight of Georgia	Pacific herring	*Clupea pallasii*	Pelagic	*	1.1700	0.9100	0.0258	0.0165	0.0230	-0.0008	0.0162	-0.0154
HERRVIa	West of Scotland	Herring	*Clupea harengus*	Pelagic	*	0.3700	0.1800	-0.0376	0.0009	-0.0377	0.0003	-0.0222	-0.0251
HERRWCVANI	West Coast of Vancouver Island	Pacific herring	*Clupea pallasii*	Pelagic	*	0.6900	0.0300	0.0266	-0.1686	0.0287	-0.1562	0.0140	-0.1783
HOKIENZ	Eastern New Zealand	Hoki	*Macruronus novaezelandiae*	Demersal	*	1.6400	1.1100	-0.0009	-0.0689	-0.0003	-0.0680	-0.0002	-0.0529
HOKIWNZ	Western New Zealand	Hoki	*Macruronus novaezelandiae*	Demersal	*	1.0600	0.5100	-0.0089	-0.1100	-0.0102	-0.1117	-0.0310	-0.0812
KELPGREENLINGORECOAST	Oregon Coast	Kelp greenling	*Hexagrammos decagrammus*	Demersal		2.9400	1.2800	0.0279	-0.0500	0.0132	-0.0609	0.0256	-0.0643
KINGKLIPSA	South Africa	Anchovy	*Engraulis encrasicolus*	Pelagic		1.1000	1.2000	-0.0120	-0.0060	-0.0113	0.0019	-0.0124	0.0057
LINGCODNPCOAST	Northern Pacific Coast	Lingcod	*Ophiodon elongatus*	Demersal				-0.0587	0.0605	-0.0425	0.1575	-0.0589	0.1395
LINGCODSPCOAST	Southern Pacific Coast	Lingcod	*Ophiodon elongatus*	Demersal				-0.0624	-0.0156	-0.0511	0.0525	-0.0591	0.0404
LNOSESKAPCOAST	Pacific Coast	Longnose skate	*Raja rhina*	Demersal	*	1.6400	1.5600	-0.0044	-0.0083	-0.0045	-0.0100	-0.0043	-0.0059
LSTHORNHPCOAST	Pacific Coast	Longspine thornyhead	*Sebastolobus altivelis*	Demersal		3.3200	2.6500	-0.0040	-0.0251	-0.0019	-0.0174	-0.0041	-0.0174
MACKGOMCHATT	Gulf of Maine / Cape Hatteras	Mackerel	*Scomber scombrus*	Pelagic		1.9700	3.6100	0.0276	0.0380	0.0336	0.0668	0.0495	0.0504
MACKNEICES	IIa-IIIabd-IV-Vb-VI-VII-VIIIabcde-XII-XIV-Ixa	Mackerel	*Scomber scombrus*	Pelagic	*	1.1600	0.9800	-0.0217	-0.0049	-0.0286	-0.0158	-0.0241	-0.0088
MENATGM	Gulf of Mexico	Gulf menhaden	*Brevoortia patronus*	Pelagic	*	1.2600	1.0800	0.0445	0.0224	0.0430	0.0160	0.0449	-0.0081
MORWONGSE	Southeast Australia	Hawaiian morwong	*Nemadactylus macropterus*	Demersal		0.6700	0.3100	-0.0102	-0.1173	-0.0078	-0.0644	-0.0146	-0.0503
MUTSNAPSATLCGM	Southern Atlantic coast and Gulf of Mexico	Mutton snapper	*Lutjanus analis*	Demersal		0.5200	1.1300	-0.0669	0.0568	-0.0523	0.0635	-0.0462	0.0555
NROCKBSAI	Bering Sea and Aleutian Islands	Northern rockfish	*Sebastes polyspinis*	Demersal		1.1400	1.4100	0.0386	0.0131	0.0388	0.0132	0.0375	0.0127
NROCKGA	Gulf of Alaska	Northern rockfish	*Sebastes polyspinis*	Demersal		2.1900	1.5000	-0.0124	0.0107	-0.0232	-0.0220	-0.0197	-0.0239
NRSOLEEBSAI	Eastern Bering Sea and Aleutian Islands	Northern rock sole	*Lepidopsetta polyxystra*	Demersal		1.7400	3.0200	0.1331	0.0546	0.1081	0.0296	0.1151	0.0365

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								pre-1992	post-1992	pre-1992	post-1992	pre-1992	post-1992
NZLINGESE	Southeast Australia	New Zealand ling	*Genypterus blacodes*	Demersal		1.4000	0.5900	-0.0165	-0.0526	-0.0150	-0.0494	-0.0173	-0.0576
NZLINGLIN3-4	New Zealand Areas LIN 3 and 4	New Zealand ling	*Genypterus blacodes*	Demersal		4.1400	3.0700	-0.0020	-0.0338	0.0074	-0.0207	-0.0082	-0.0200
NZLINGLIN5-6	New Zealand Areas LIN 5 and 6	New Zealand ling	*Genypterus blacodes*	Demersal		5.1300	3.9600	-0.0044	-0.0190	-0.0014	-0.0149	-0.0021	-0.0173
NZLINGLIN6b	New Zealand Areas LIN 6b	New Zealand ling	*Genypterus blacodes*	Demersal		3.7800	2.1900	-0.0050	-0.0358	0.0014	-0.0324	-0.0074	-0.0390
NZLINGLIN72	New Zealand Areas LIN 72	New Zealand ling	*Genypterus blacodes*	Demersal		3.0500	2.4900	-0.0231	-0.0113	-0.0156	-0.0008	-0.0220	-0.0136
NZLINGLIN7WC	New Zealand Areas LIN 7WC-WCSI	New Zealand ling	*Genypterus blacodes*	Demersal		2.0600	2.2100	-0.0184	-0.0104	-0.0120	-0.0024	-0.0180	0.0045
NZLINGWSE	Western half of Southeast Australia	New Zealand ling	*Genypterus blacodes*	Demersal		1.6600	1.0800	-0.0041	-0.0172	-0.0043	-0.0176	-0.0100	-0.0283
NZSNAPNZ8	New Zealand Area 8 (Auckland and Central West)	New Zealand snapper	*Chrysophrys auratus*	Demersal		0.5100	0.3500	-0.0454	-0.0335	-0.0443	-0.0154	-0.0368	-0.0285
OROUGHYNZMEC	New Zealand Mid East Coast	Orange roughy	*Hoplostethus atlanticus*	Demersal		1.3400	1.2000	-0.1496	-0.0199	-0.1119	0.0029	-0.1274	-0.0088
OROUGHYSE	Southeast Australia	Orange roughy	*Hoplostethus atlanticus*	Demersal		2.3300	0.5200	-0.1073	-0.1450	-0.0096	-0.0797	-0.0587	-0.1002
PCODBSAI	Bering Sea and Aleutian Islands	Pacific cod	*Gadus macrocephalus*	Demersal		1.3200	1.0000	0.0338	-0.0298	0.0767	-0.0003	0.0422	-0.0174
PCODGA	Gulf of Alaska	Pacific cod	*Gadus macrocephalus*	Demersal		1.2500	0.9100	0.0684	-0.0399	0.0960	-0.0209	0.0622	-0.0198
PERCHEBSAI	Eastern Bering Sea and Aleutian Islands	Pacific ocean perch	*Sebastes alutus*	Demersal		0.7400	1.2300	0.1033	0.0404	0.0822	0.0275	0.0816	0.0304
PHAKEPCOAST	Pacific Coast	Pacific hake	*Merluccius productus*	Demersal		4.3800	1.6100	-0.0018	-0.0904	0.0249	-0.0336	0.0020	-0.0624
PLAIC7d	Eastern English Channel	European Plaice	*Pleuronectes platessa*	Demersal				0.0415	-0.0674	0.0809	-0.0457	0.0276	-0.0376
PLAICCELT	Celtic Sea	European Plaice	*Pleuronectes platessa*	Demersal	*	0.9800	0.6500	0.0517	-0.0960	0.0843	-0.0674	0.0660	-0.0592
PLAICECHW	Western English Channel	European Plaice	*Pleuronectes platessa*	Demersal	*	0.7200	0.5100	0.0403	-0.0536	0.0785	-0.0153	0.0505	-0.0392
PLAICIIIa	Kattegat and Skagerrak	European Plaice	*Pleuronectes platessa*	Demersal				-0.0115	-0.0443	-0.0265	-0.0557	-0.0137	-0.0320
PLAICIS	Irish Sea	European Plaice	*Pleuronectes platessa*	Demersal	*	0.5700	1.0700	-0.0266	0.0331	-0.0198	0.0545	-0.0256	0.0482
PLAICNS	North Sea	European Plaice	*Pleuronectes platessa*	Demersal				-0.0033	-0.0366	0.0021	-0.0096	-0.0009	-0.0250
POLL4VWX5Zc	Scotian Shelf, Bay of Fundy and Georges Bank	Pollock	*Pollachius virens*	Demersal	*	0.6200	0.5600	-0.1202	-0.0183	-0.0543	0.0064	-0.0561	0.0004

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								Continuous		Discontinuous		Drift	
Stock ID	Area	Common name	Scientific name	Category	type	ratio 1992	ratio current	pre-1992	post-1992	pre-1992	post-1992	pre-1992	post-1992
POLLFAPL	Faroe Plateau	Pollock	*Pollachius virens*	Demersal	*	0.5200	0.9900	-0.0148	0.0068	-0.0056	0.0423	-0.0119	0.0355
POLLNEAR	North-East Arctic	Pollock	*Pollachius virens*	Demersal	*	0.7200	1.7000	-0.0447	0.1547	-0.0546	0.1137	-0.0275	0.1339
POLLNS-VI-IIIa	IIIa, VI and North Sea	Pollock	*Pollachius virens*	Demersal	*	0.2700	0.5700	-0.0517	0.0700	-0.0483	0.0784	-0.0313	0.0781
POPERCHGA	Gulf of Alaska	Pacific ocean perch	*Sebastes alutus*	Demersal		0.3000	1.1600	-0.0686	0.1400	-0.0901	0.0747	-0.0698	0.0853
POPERCHPCOAST	Pacific Coast	Pacific ocean perch	*Sebastes alutus*	Demersal		0.5300	0.6900	-0.0429	0.0053	-0.0399	0.0194	-0.0398	0.0174
PSOLENPCOAST	Northern Pacific Coast	Petrale sole	*Eopsetta jordani*	Demersal		0.4800	1.8700	-0.0293	0.0324	-0.0268	0.1124	-0.0300	0.1050
PSOLESPCOAST	Southern Pacific Coast	Petrale sole	*Eopsetta jordani*	Demersal		0.2700	1.1300	-0.0220	-0.0063	-0.0206	0.0872	-0.0226	0.1089
PTOOTHFISHPEI	South Africa Subantarctic Prince Edward Islands	Patagonian toothfish	*Dissostichus eleginoides*	Demersal		4.8800	1.8100	0.0033	-0.0656	-0.0004	-0.0775	-0.0005	-0.0619
REXSOLEGA	Gulf of Alaska	Rex sole	*Glyptocephalus zachirus*	Demersal		2.2200	2.6000	0.0142	0.0005	0.0147	0.0006	0.0235	0.0103
REYEROCKBSAI	Bering Sea and Aleutian Islands	Rougheye rockfish	*Sebastes aleutianus*	Demersal		1.1100	1.1500	0.0088	0.0020	0.0140	0.0052	0.0000	0.0021
REYEROCKGA	Gulf of Alaska	Rougheye rockfish	*Sebastes aleutianus*	Demersal		1.4700	1.6400	-0.0209	0.0068	-0.0199	0.0075	-0.0207	0.0071
RPORGYSATLC	Southern Atlantic coast	Common seabream	*Pagrus pagrus*	Demersal		0.3200	0.6100	-0.1179	0.0182	-0.0982	0.0594	-0.1020	0.0550
RSNAPEGM	Eastern Gulf of Mexico	Red snapper	*Lutjanus campechanus*	Demersal				-0.1176	0.0441	-0.1101	0.0922	-0.0999	0.0612
RSNAPSATLC	Southern Atlantic coast	Red snapper	*Lutjanus campechanus*	Demersal		0.0200	0.0200	-0.1215	0.0697	-0.1256	0.0321	-0.0947	0.0098
SABLEFEBSAIGA	Eastern Bering Sea / Aleutian Islands / Gulf of Alaska	Sablefish	*Anoplopoma fimbria*	Demersal		1.2800	1.0500	-0.0150	-0.0163	-0.0126	-0.0085	-0.0051	-0.0123
SABLEFPCOAST	Pacific Coast	Sablefish	*Anoplopoma fimbria*	Demersal	*	0.9300	0.8400	-0.0068	-0.0542	-0.0055	-0.0150	-0.0089	-0.0099
SARDNPAC	North Pacific	Sardine	*Sardinops sagax*	Pelagic	*	0.3100	1.7300	0.4959	0.0867	0.4736	0.0787	0.4155	0.0870
SARDPCOAST	Pacific Coast	Sardine	*Sardinops sagax*	Pelagic	*		1.3600	0.5457	0.0878	0.5053	0.0715	0.4600	0.0714
SARDPVIIIc-IXa	VIIIc-IXa	European pilchard	*Sardina pilchardus*	Pelagic				-0.0033	-0.0094	0.0041	-0.0044	0.0233	0.0071
SBELLYROCKPCOAST	Pacific Coast	Shortbelly rockfish	*Sebastes jordani*	Demersal				-0.0181	-0.0222	-0.0249	-0.0774	-0.0245	-0.0589
SBWHITACIR	New Zealand - Campbell Island Rise	Southern blue whiting	*Micromesistius australis*	Demersal		0.5600	1.1500	-0.0131	0.0447	-0.0508	0.0202	-0.0646	0.0514
SFLOUNMATLC	Mid-Atlantic Coast	Summer flounder	*Paralichthys dentatus*	Demersal		0.1800	0.7200	-0.0720	0.1143	-0.1371	0.0928	-0.0944	0.0943

Continued on next page

Stock ID	Area	Common name	Scientific name	Category	type	ratio 1992	ratio current	Continuous		Discontinuous		Drift	
								pre-1992	post-1992	pre-1992	post-1992	pre-1992	post-1992
SILVERFISHSE	Southeast Australia	Silverfish	*Seriolella punctata*	Demersal		1.1700	1.0300	-0.0384	-0.0214	-0.0285	-0.0139	-0.0442	-0.0093
SKJCWPAC	Central Western Pacific	Skipjack tuna	*Katsuwonus pelamis*	Pelagic		4.0000	4.3800	0.0184	-0.0036	0.0269	0.0099	0.0098	0.0065
SMOOTHOREOCR	Chatham Rise	Smooth oreo	*Pseudocyttus maculatus*	Demersal		2.9900	2.2500	-0.0243	-0.0226	-0.0213	-0.0206	-0.0222	-0.0203
SMOOTHOREOWECR	West end of Chatham Rise	Smooth oreo	*Pseudocyttus maculatus*	Demersal		1.5900	1.2500	-0.0500	-0.0404	-0.0401	-0.0217	-0.0481	-0.0203
SNOWGROUPSATLC	Southern Atlantic coast	Snowy grouper	*Epinephelus niveatus*	Demersal		0.3400	0.1900	-0.0824	-0.0755	-0.0779	-0.0437	-0.0707	-0.0589
SOLECS	Celtic Sea	common European sole	*Solea vulgaris*	Demersal	*	0.8600	0.9000	-0.0555	0.0275	-0.0538	0.0304	-0.0480	0.0052
SOLEIS	Irish Sea	common European sole	*Solea vulgaris*	Demersal	*	0.6700	0.3600	-0.0193	-0.0333	-0.0125	-0.0201	-0.0313	-0.0399
SOLENS	North Sea	common European sole	*Solea vulgaris*	Demersal				-0.0126	-0.0198	-0.0199	-0.0558	0.0058	-0.0674
SOLEVIId	Eastern English Channel	common European sole	*Solea vulgaris*	Demersal				0.0207	-0.0034	0.0057	-0.0090	0.0223	0.0025
SOLEVIIe	Western English Channel	common European sole	*Solea vulgaris*	Demersal	*	0.6100	0.5100	-0.0005	-0.0292	0.0082	-0.0108	-0.0034	-0.0149
SOUTHHAKECR	Chatham Rise	Southern hake	*Merluccius australis*	Demersal		5.1800	1.7700	0.0102	-0.0690	0.0139	-0.0648	0.0044	-0.0768
SOUTHHAKESA	Sub-Antarctic	Southern hake	*Merluccius australis*	Demersal		5.4700	2.9100	0.0130	-0.0495	0.0267	-0.0358	0.0103	-0.0421
SPANMACKSATLC	Southern Atlantic coast	Spanish mackerel	*Scomberomorus maculatus*	Pelagic		0.2500	0.3800	-0.0388	0.0566	-0.0430	0.0300	-0.0373	0.0282
SPRAT22-32	Baltic Areas 22-32	Sprat	*Sprattus sprattus*	Pelagic	*	1.1500	1.1300	0.0290	0.0440	-0.0229	-0.0144	0.0140	0.0097
SSTHORNHPCOAST	Pacific Coast	Shortspine thornyhead	*Sebastolobus alascanus*	Demersal		1.7300	1.5700	-0.0030	-0.0286	-0.0025	-0.0064	-0.0041	-0.0074
STFLOUNNPCOAST	Northern Pacific Coast	Starry flounder	*Platichthys stellatus*	Demersal		4.1600	1.1000	0.0498	-0.0333	0.0279	-0.0815	0.0448	-0.1024
STFLOUNSPCOAST	Southern Pacific Coast	Starry flounder	*Platichthys stellatus*	Demersal		1.7900	1.5500	0.0190	-0.0069	0.0334	0.0246	0.0055	-0.0114
STRIPEDBASSGOMCHATT	Gulf of Maine / Cape Hatteras	Striped bass	*Morone saxatilis*	Demersal				0.2426	0.0892	0.1807	0.0660	0.2060	0.0651
SWHITSE	Southeast Australia	School whiting	*Sillago flindersi*	Demersal		0.9900	0.6600	-0.0138	-0.0461	-0.0136	-0.0446	-0.0162	-0.0265
SWORDNATL	Northern Atlantic	Swordfish	*Xiphias gladius*	Pelagic	*	0.9100	1.0300	-0.0685	-0.0018	-0.0622	0.0036	-0.0479	0.0115
TIGERFLATSE	Southeast Australia	Tiger flathead	*Neoplatycephalus richardsoni*	Demersal		2.2400	1.9900	-0.0138	0.1060	-0.0180	-0.0038	-0.0094	-0.0086
TILESATLC	Southern Atlantic coast	Tilefish	*Lopholatilus chamaeleonticeps*	Demersal		1.0100	0.9400	-0.0401	-0.0226	-0.0367	0.0017	-0.0349	-0.0075
TREVALLYTRE7	New Zealand Areas TRE 7	Trevally	*Pseudocaranx dentex*	Demersal		1.8500	1.4400	-0.0211	-0.0096	-0.0223	-0.0230	-0.0144	-0.0193
VSNAPGM	Gulf of Mexico	Vermilion snapper	*Rhomboplites aurorubens*	Demersal				-0.0192	-0.0432	0.0152	-0.0224	-0.0077	-0.0363

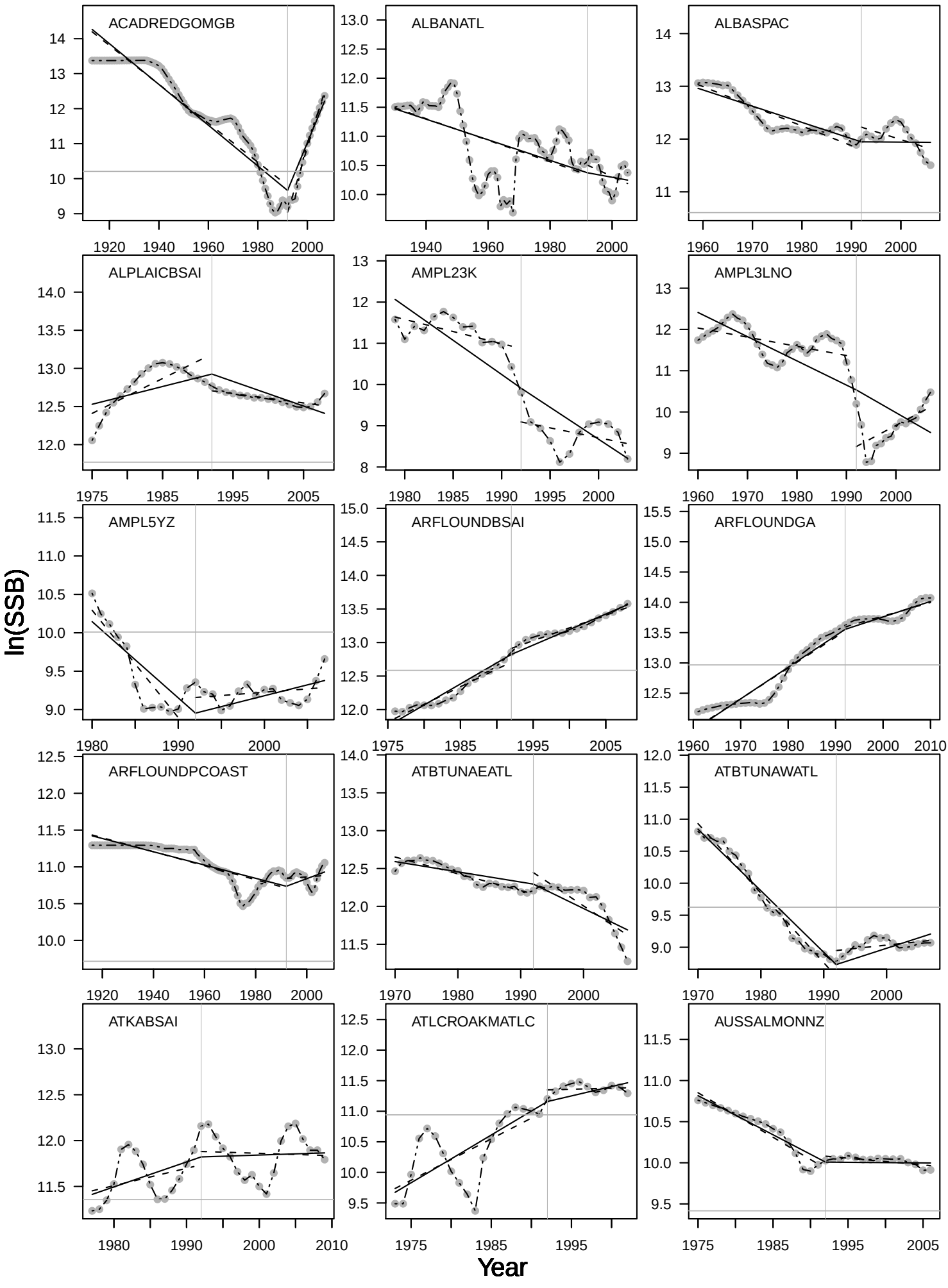
Continued on next page

Stock ID	Area	Common name	Scientific name	Category	type	ratio 1992	ratio current	Continuous		Discontinuous		Drift	
								pre-1992	post-1992	pre-1992	post-1992	pre-1992	post-1992
VSNAPSATLC	Southern Atlantic coast	Vermilion snapper	*Rhomboplites aurorubens*	Demersal		1.1200	0.8600	-0.0242	-0.0199	-0.0243	-0.0209	-0.0239	-0.0197
WEAKFISHATLC	Atlantic Coast	Weakfish	*Cynoscion regalis*	Demersal		7.0700	0.7900	-0.0379	-0.1393	-0.0597	-0.1488	-0.0611	-0.1373
WHAKEGBGOM	Gulf of Maine / Georges Bank	White hake	*Urophycis tenuis*	Demersal		0.5600	0.3500	0.0018	-0.0776	0.0189	-0.0266	0.0131	-0.0306
WHITNS-VIId-IIIa	IIIa, VIId and North Sea	Whiting	*Merlangius merlangus*	Demersal	*	0.8900	0.3300	-0.0428	-0.0543	-0.0464	-0.0563	-0.0557	-0.0718
WHITVIIek	Celtic Sea	Whiting	*Merlangius merlangus*	Demersal	*	0.7900	0.4400	0.1253	-0.0294	0.0679	-0.0509	0.0713	-0.0221
WINFLOUN5Z	Georges Bank	Winter flounder	*Pseudopleuronectes americanus*	Demersal		0.3300	0.2800	-0.0969	0.0320	-0.1025	0.0299	-0.1103	-0.0116
WINFLOUNSNEMATL	Southern New England /Mid Atlantic	Winter flounder	*Pseudopleuronectes americanus*	Demersal		0.0900	0.0900	-0.1354	-0.0099	-0.1311	-0.0081	-0.1305	-0.0029
WITFLOUN5Y	Gulf of Maine	Witch flounder	*Glyptocephalus cynoglossus*	Demersal		0.6200	0.3000	-0.0984	-0.0125	-0.0985	-0.0125	-0.0716	-0.0480
WPOLLAI	Aleutian Islands	Walleye pollock	*Theragra chalcogramma*	Demersal		2.2300	0.8600	-0.0554	-0.0938	0.0239	-0.0466	-0.0171	-0.0596
WPOLLEBS	Eastern Bering Sea	Walleye pollock	*Theragra chalcogramma*	Demersal		1.1100	0.6600	0.0627	-0.0330	0.0636	-0.0307	0.0491	-0.0324
WPOLLGA	Gulf of Alaska	Walleye pollock	*Theragra chalcogramma*	Demersal		1.4500	0.7700	-0.0414	-0.0662	-0.0308	-0.0589	-0.0422	-0.0393
WROCKPCOAST	Pacific Coast	Widow rockfish	*Sebastes entomelas*	Demersal	*	0.9600	0.9100	-0.0248	-0.0416	-0.0202	-0.0198	-0.0217	-0.0144
YELLGB	Georges Bank	Yellowtail flounder	*Limanda ferruginea*	Demersal		0.1000	0.2200	-0.0742	0.0720	-0.0947	0.0462	-0.0664	0.0504
YELLSNEMATL	Southern New England /Mid Atlantic	Yellowtail flounder	*Limanda ferruginea*	Demersal		0.0600	0.1300	-0.1046	-0.0357	-0.0497	0.0334	-0.1027	0.0476
YEYEROCKPCOAST	Pacific Coast	Yelloweye rockfish	*Sebastes ruberrimus*	Demersal	*	0.6600	0.3800	-0.0180	-0.1088	-0.0138	-0.0268	-0.0210	-0.0297
YFINATL	Atlantic	Yellowfin tuna	*Thunnus albacares*	Pelagic		1.7900	1.0700	-0.0065	-0.0358	-0.0077	-0.0382	-0.0178	-0.0370
YFINCWPAC	Central Western Pacific	Yellowfin tuna	*Thunnus albacares*	Pelagic		2.3800	1.2200	-0.0125	-0.0549	-0.0136	-0.0628	-0.0094	-0.0513
YFINEPAC	Northeast Pacific	Yellowfin tuna	*Thunnus albacares*	Pelagic				0.0389	-0.0084	0.0307	-0.0166	-0.0067	-0.0204
YSOLEBSAI	Bering Sea and Aleutian Islands	Yellowfin sole	*Limanda aspera*	Demersal		2.5000	1.9400	0.0990	-0.0365	0.1065	-0.0180	0.0789	-0.0160
YTROCKNPCOAST	Northern Pacific Coast	Yellowtail rockfish	*Sebastes flavidus*	Demersal		1.4500	1.3600	-0.0224	0.0053	-0.0229	0.0040	-0.0176	-0.0049

Continued on next page

Stock ID	Area	Common name	Scientific name	Category	type	ratio 1992	ratio current	Continuous		Discontinuous		Drift	
								pre-1992	post-1992	pre-1992	post-1992	pre-1992	post-1992

Table 1: A description of each population's alphanumeric identification code, geographic location, common and scientific names, taxonomic category, reference point type, ratios of biomass to MSY reference point for 1992 and the current year and values for the slopes under the three different models.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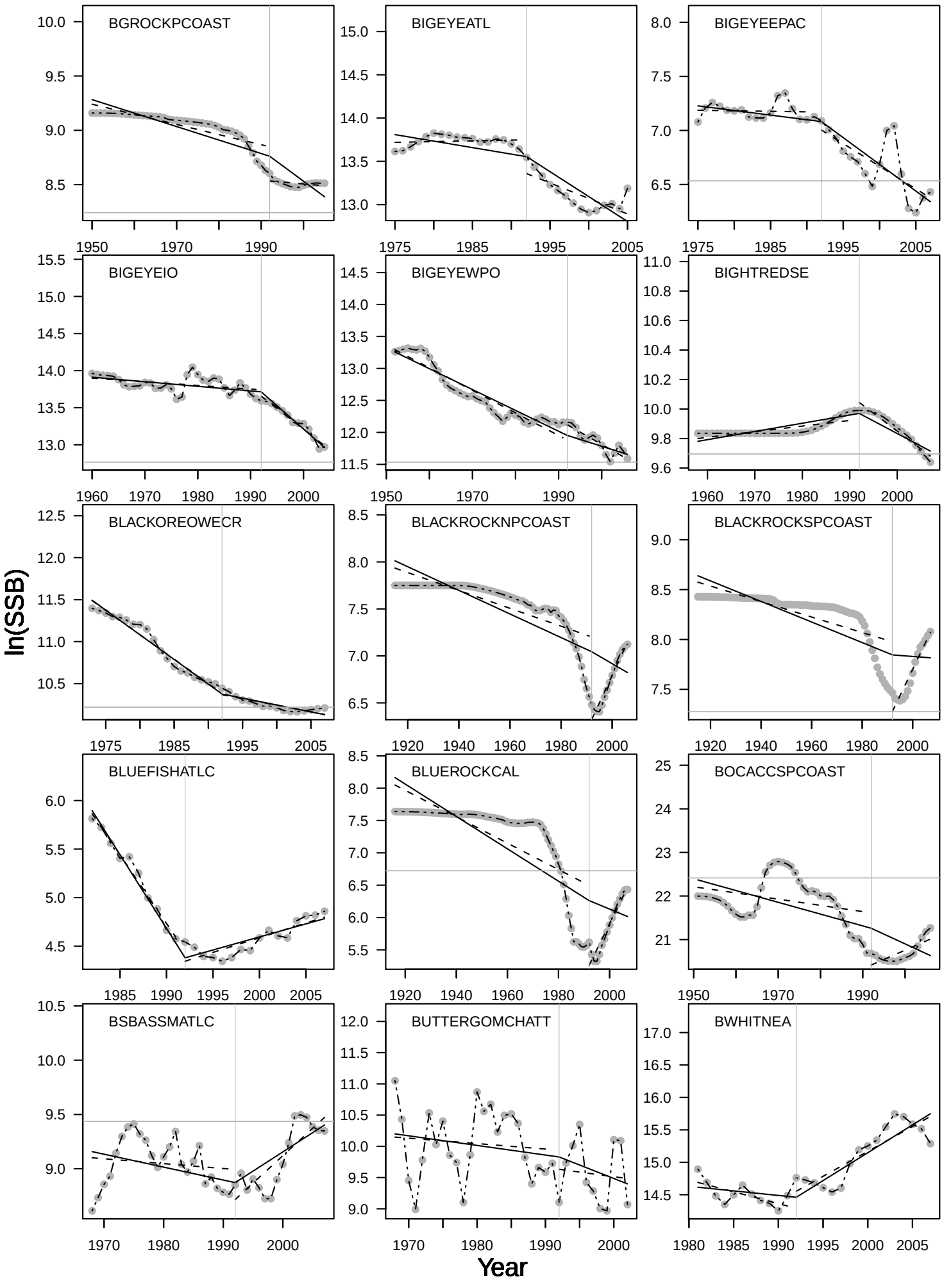
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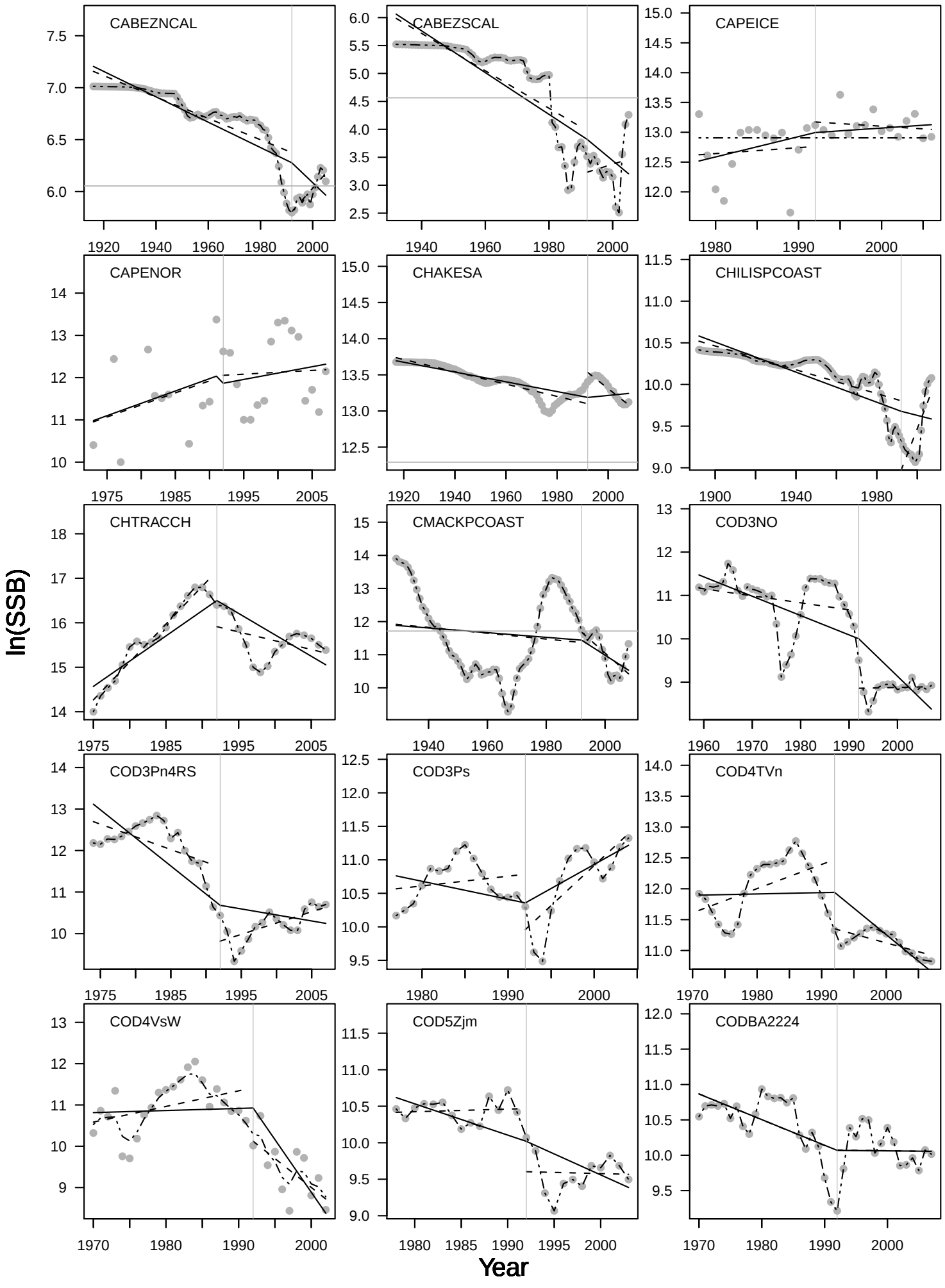
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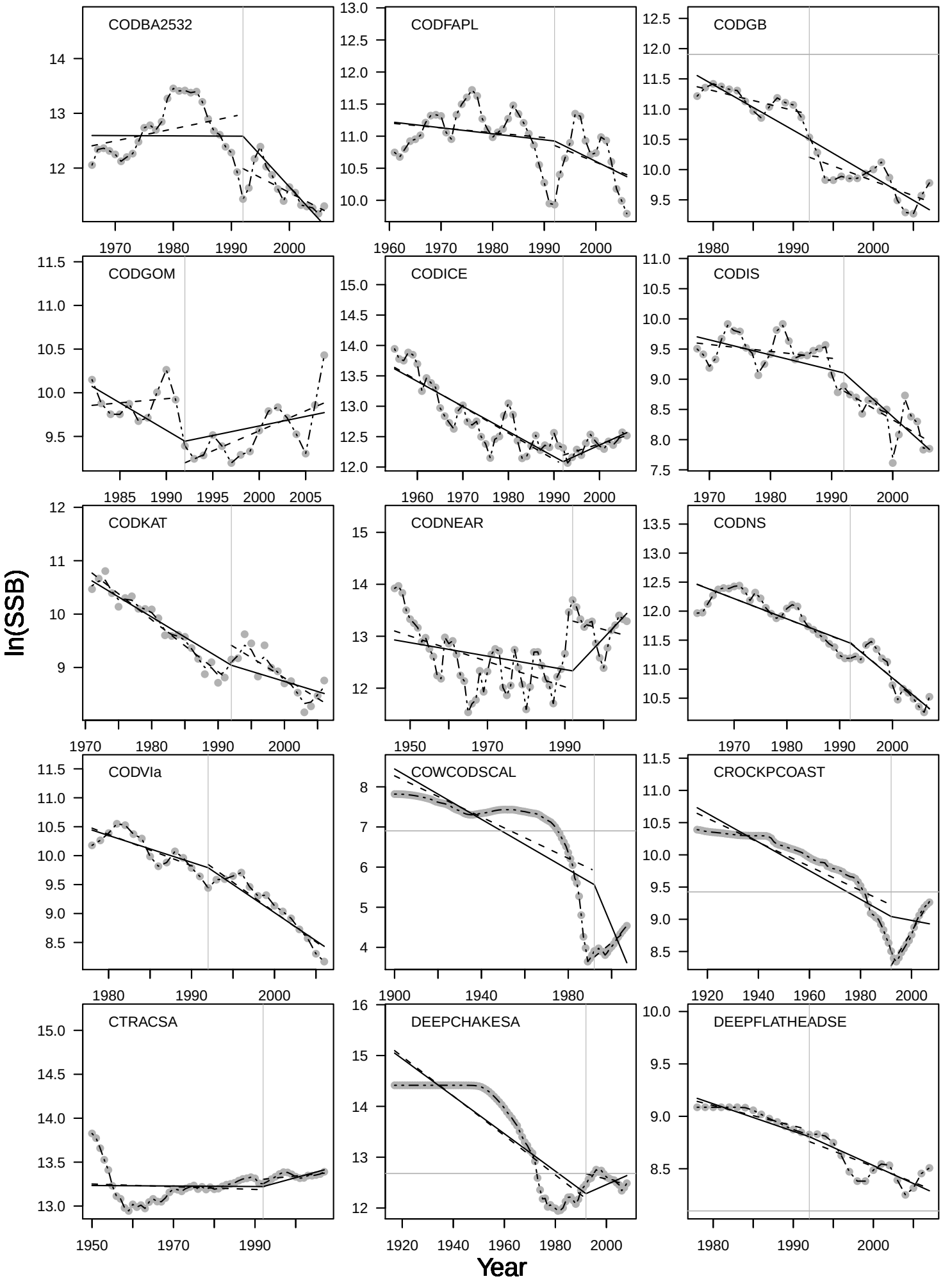
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CTRACSA
DEEPCHAKESA
DEEPFLATHEADSE
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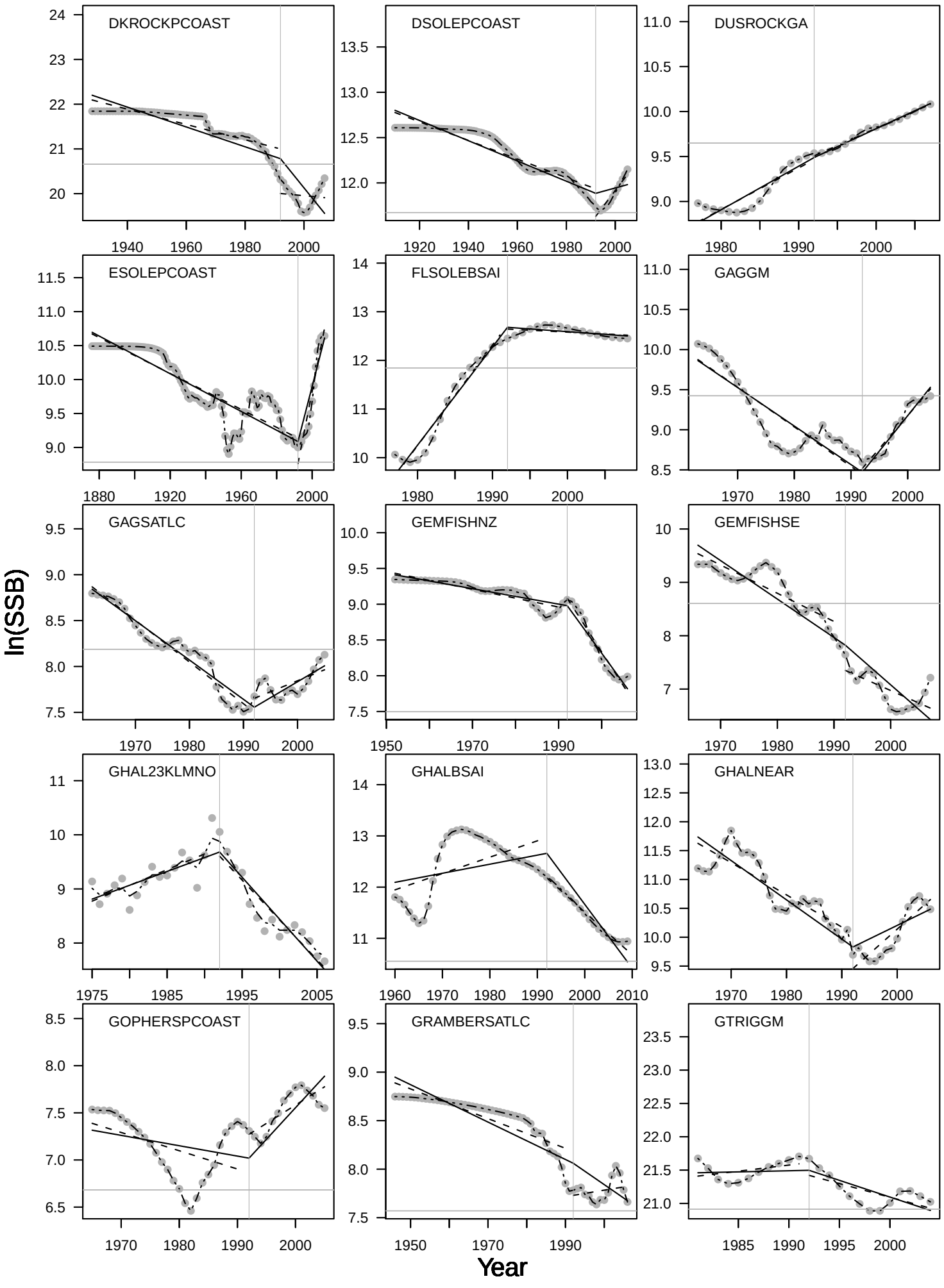
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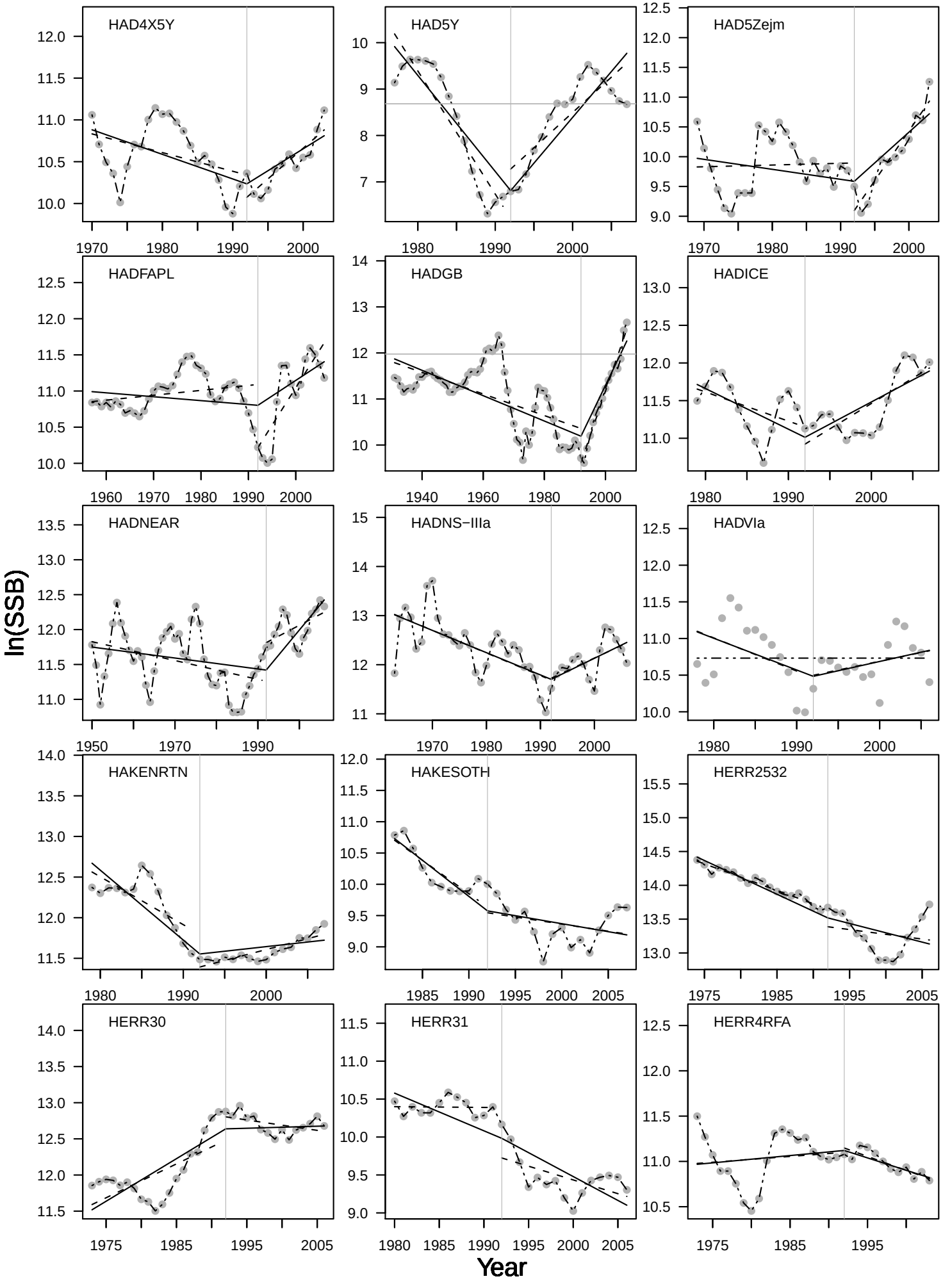
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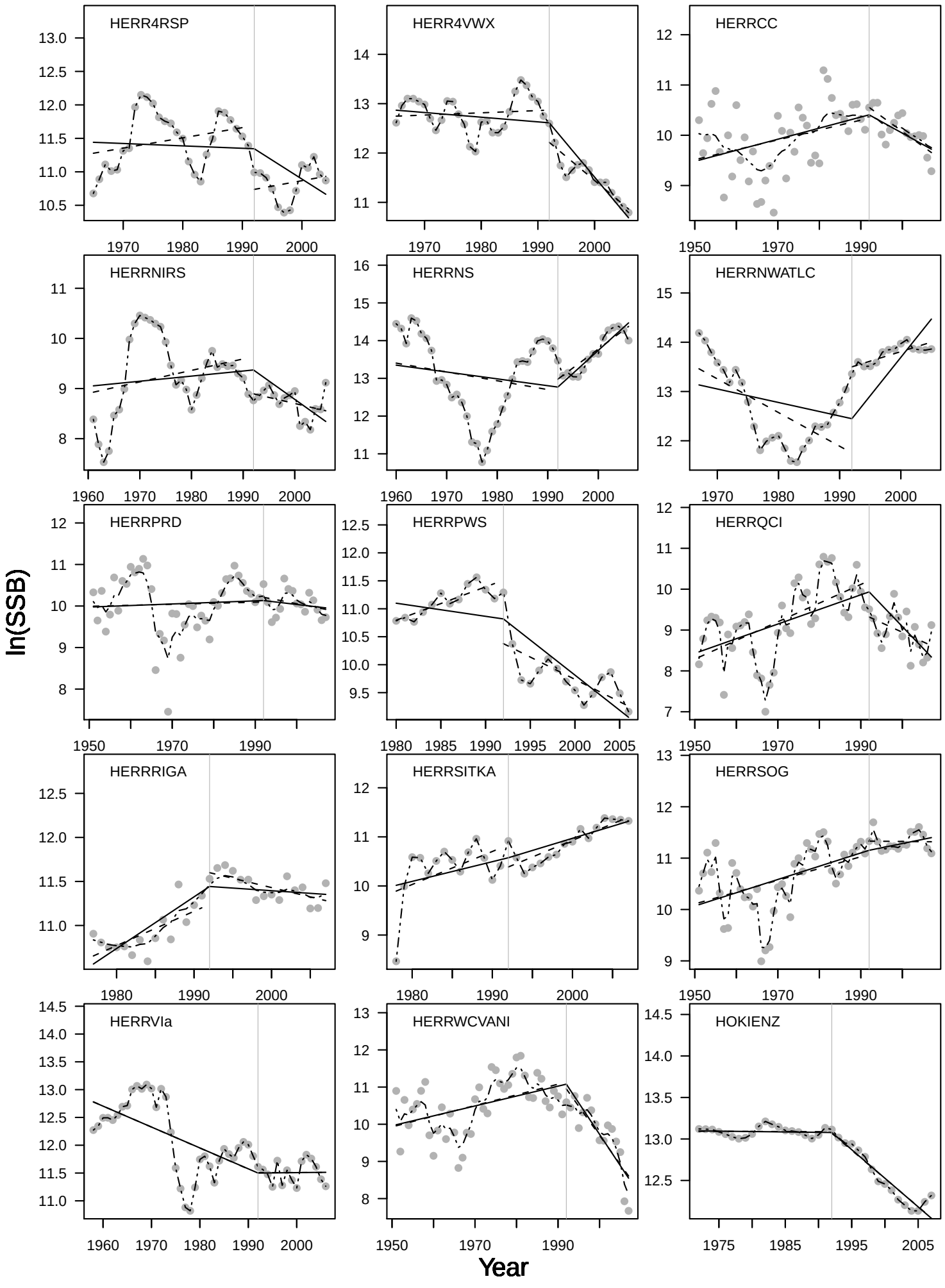
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HERRWCVANI
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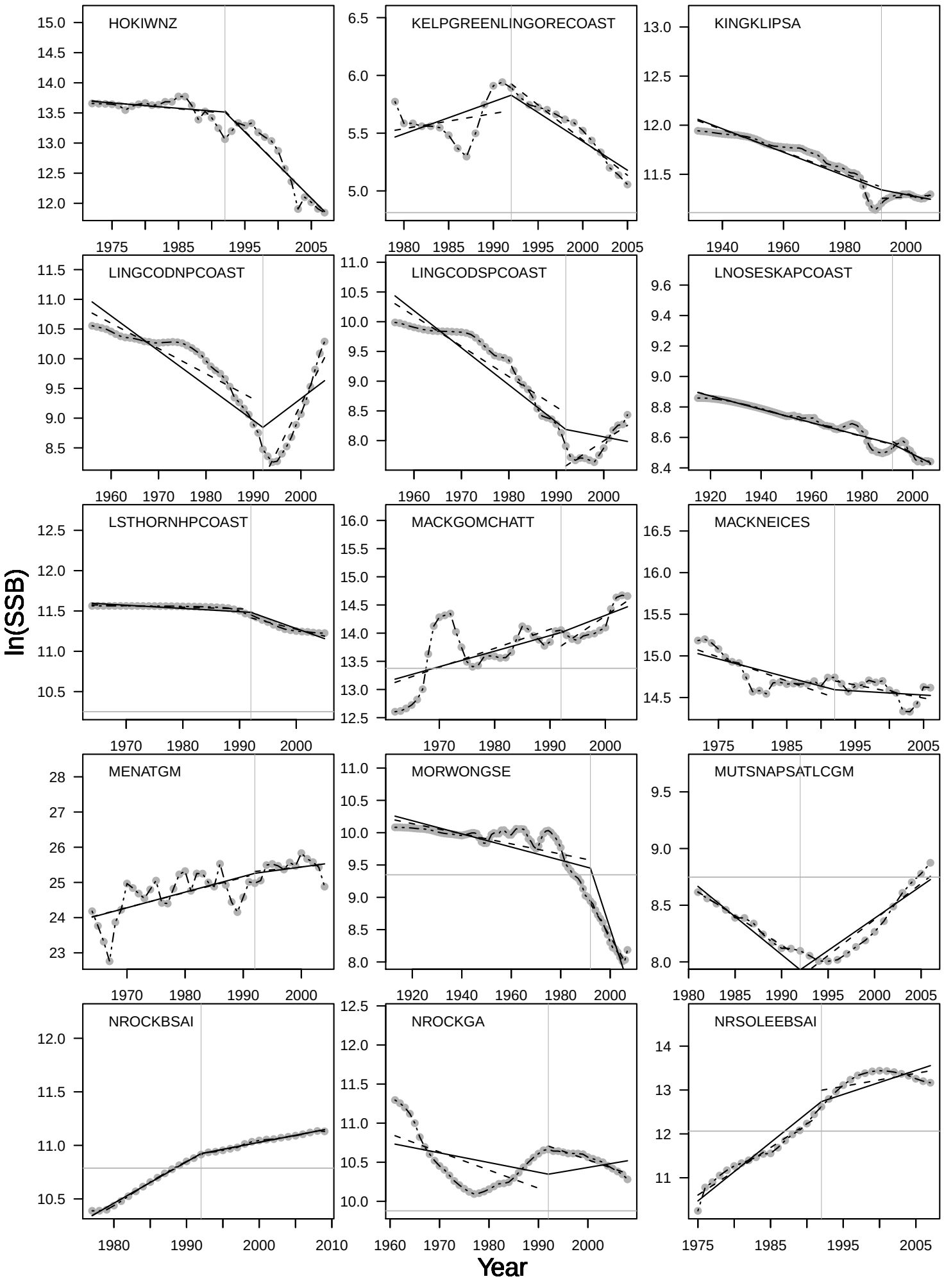
Year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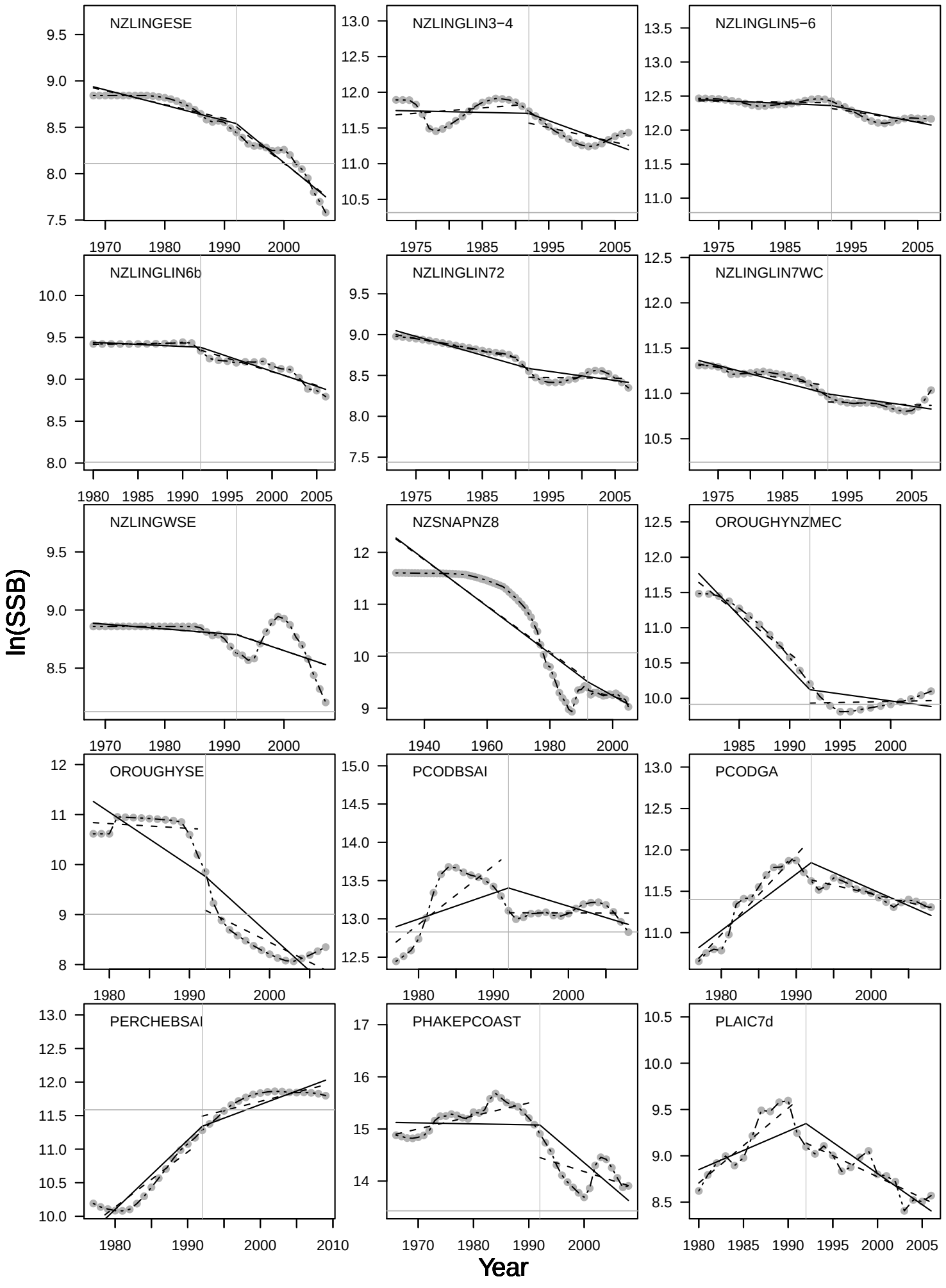
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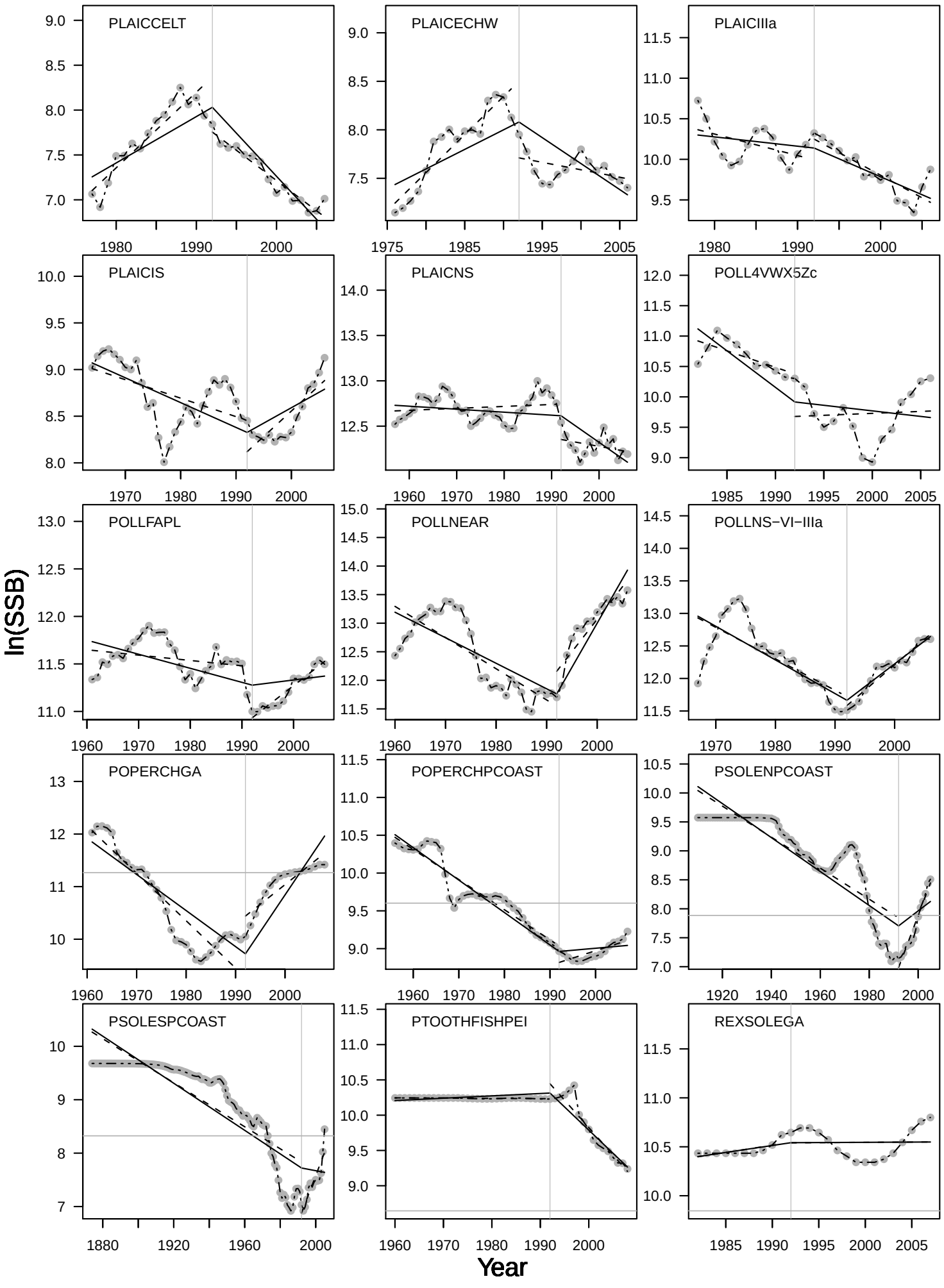
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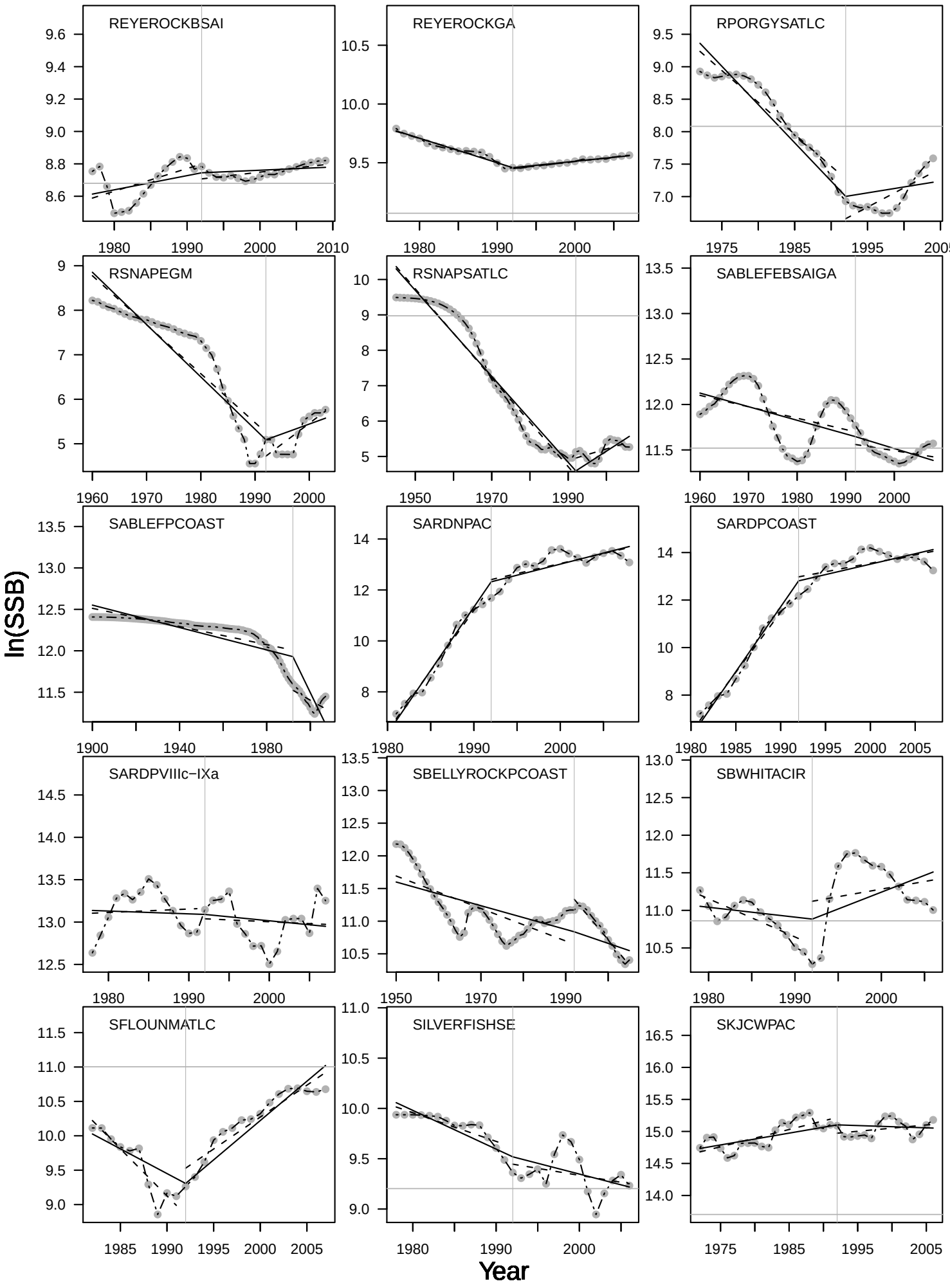
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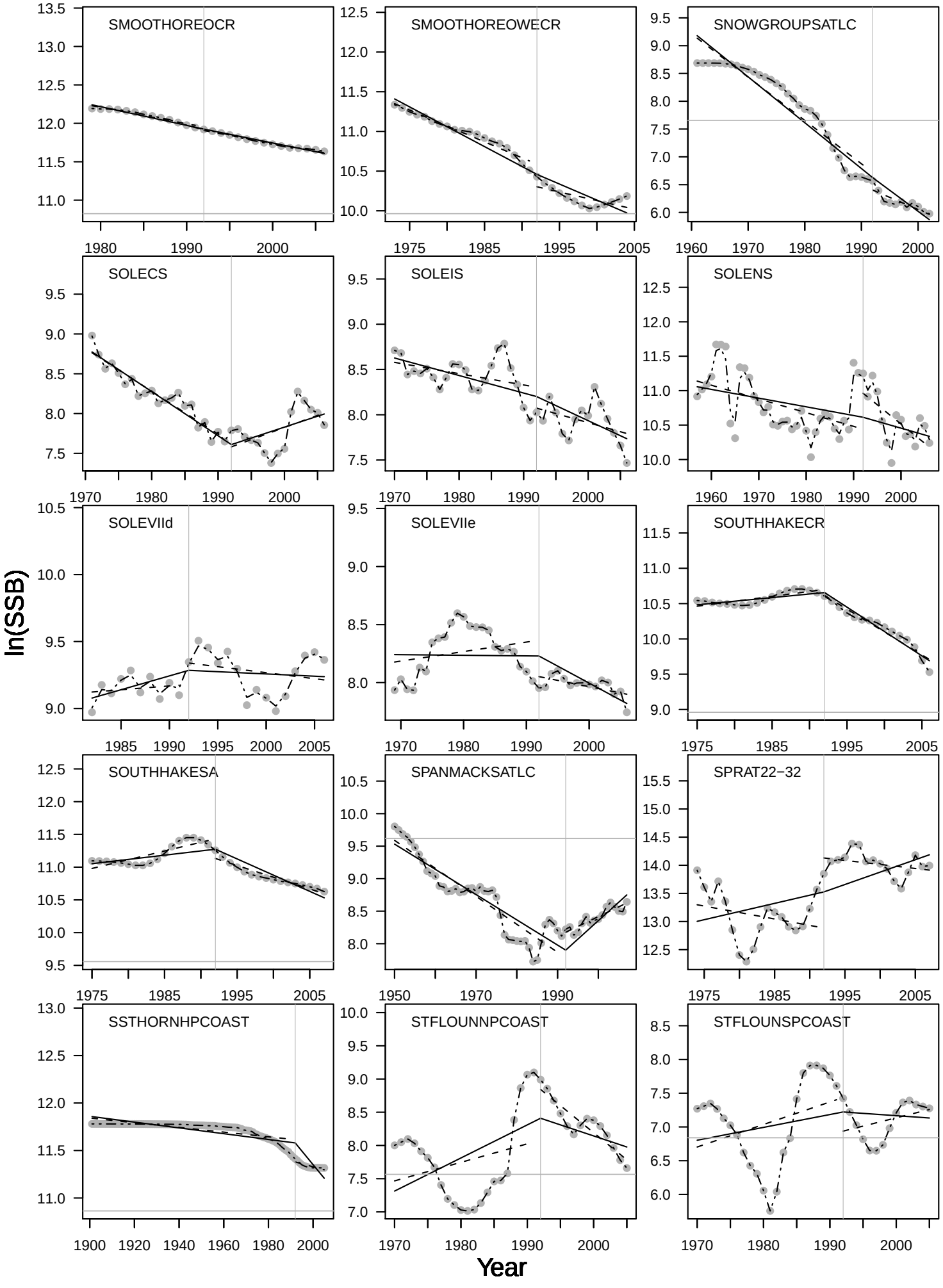
Year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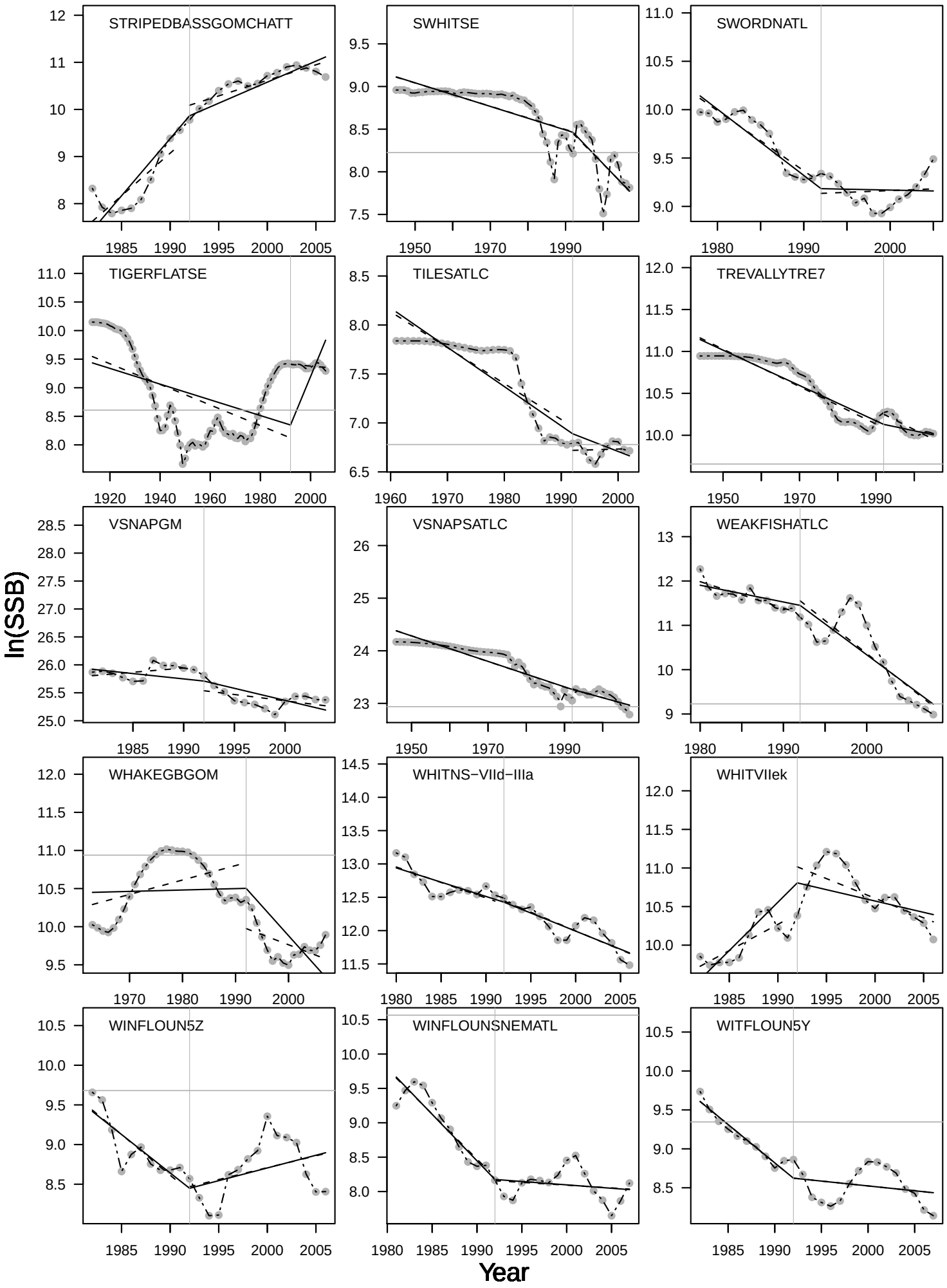
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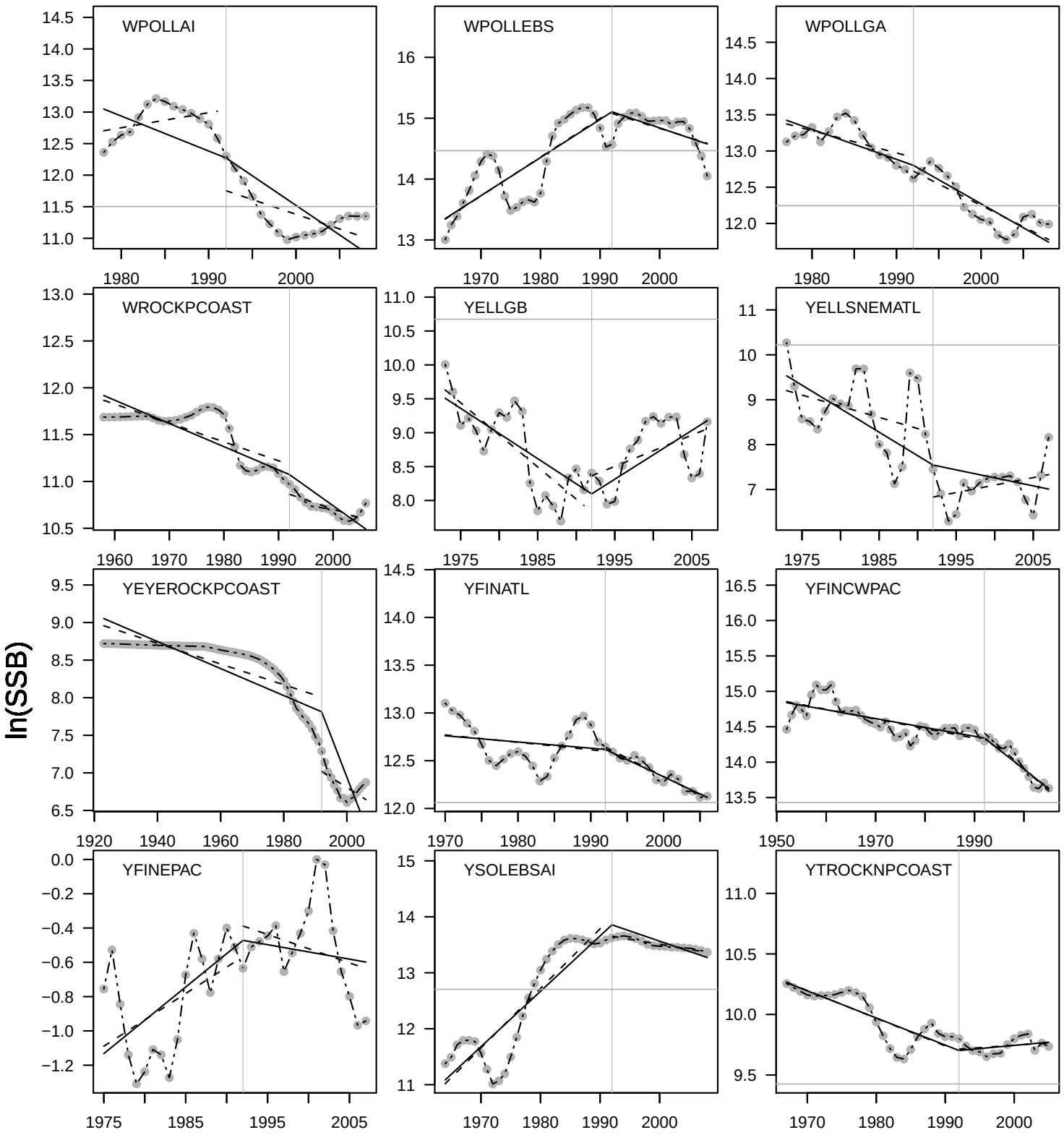
Year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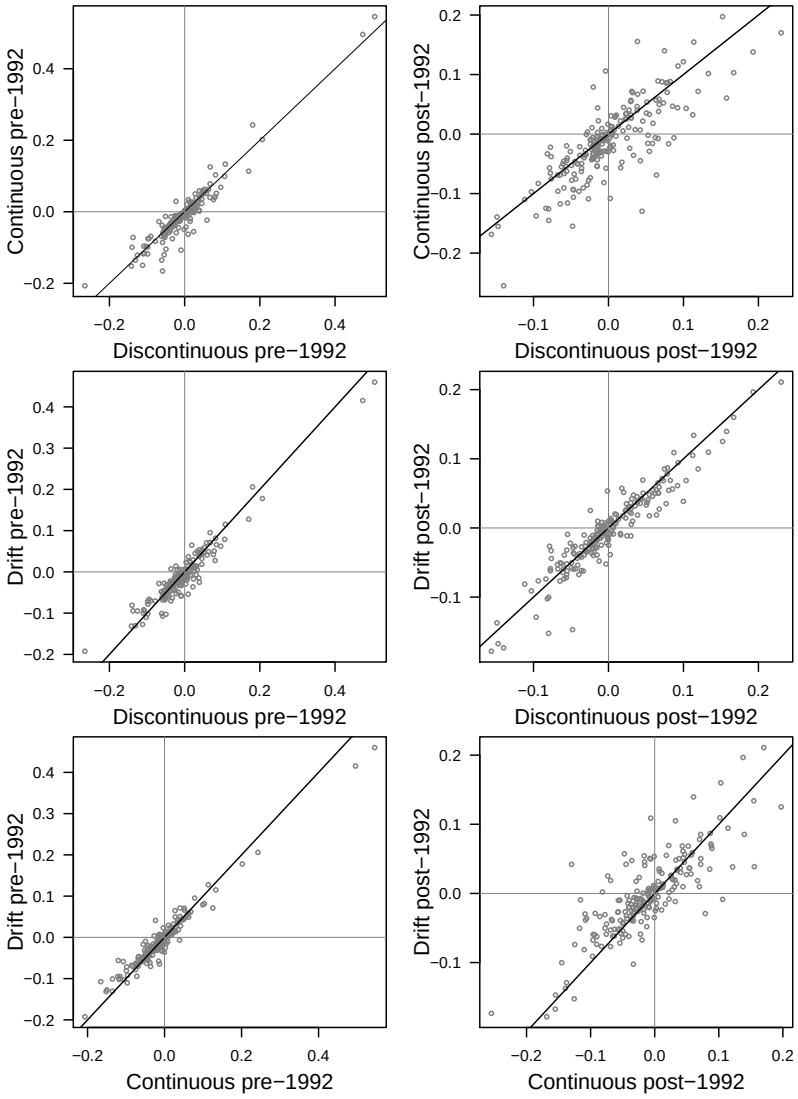
Year

Figure S1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Continuous pre−1992
Drift post−1992
Continuous post−1992

Figure S2