

Summary of the fitted operating models

ABT-MSE

Tom Carruthers

September 27, 2017

OM design

Factor 1: Future Recruitment

-
- 1: West - Hockey stick, East - '83+ B-H $h=0.98$
 - 2: West - B-H h estimated, East - '83+ B-H $h=0.7$
 - 3: West - Hockey stock changes to B-H after 10 yrs, East - 83+ B-H with $h=0.98$ changes to '50-82 B-H with $h=0.98$ after 10 years
-

Factor 2: Current Abundance

-
- A: West - Best estimates of SSB
B: Western Area SSB matches VPA
C: Eastern Area SSB inc as VPA
-

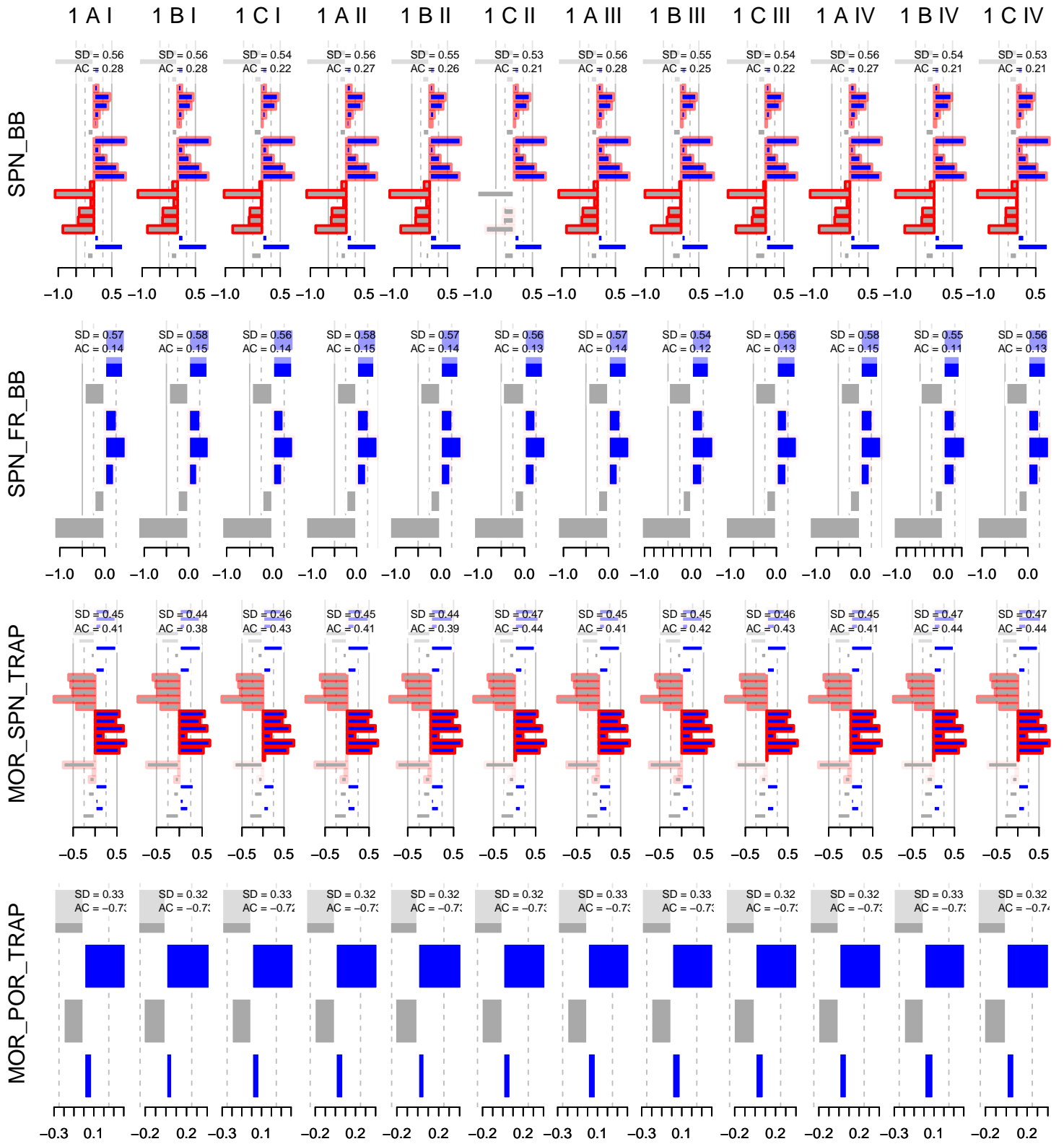
Factor 3: Natural Mortality / Maturity

-
- I: Younger spawning, High M
II: Younger spawning, Low M
III: Older spawning, High M
IV: Older spawning, Low M
-

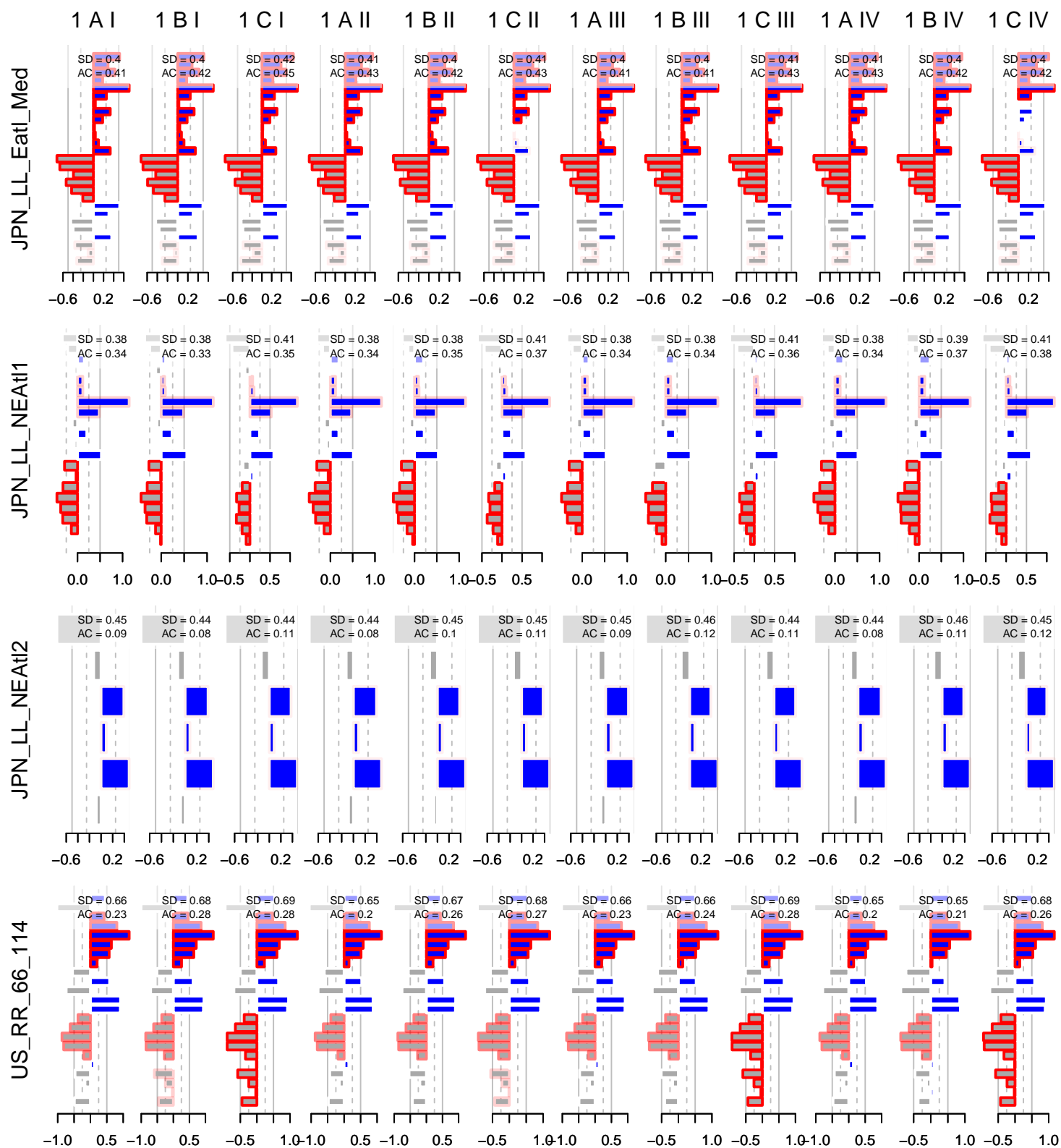
Design matrix

OM No.	Future Recruitment	Current Abundance	Maturity / M
1	1	A	I
2	2	A	I
3	3	A	I
4	1	B	I
5	2	B	I
6	3	B	I
7	1	C	I
8	2	C	I
9	3	C	I
10	1	A	II
11	2	A	II
12	3	A	II
13	1	B	II
14	2	B	II
15	3	B	II
16	1	C	II
17	2	C	II
18	3	C	II
19	1	A	III
20	2	A	III
21	3	A	III
22	1	B	III
23	2	B	III
24	3	B	III
25	1	C	III
26	2	C	III
27	3	C	III
28	1	A	IV
29	2	A	IV
30	3	A	IV
31	1	B	IV
32	2	B	IV
33	3	B	IV
34	1	C	IV
35	2	C	IV
36	3	C	IV

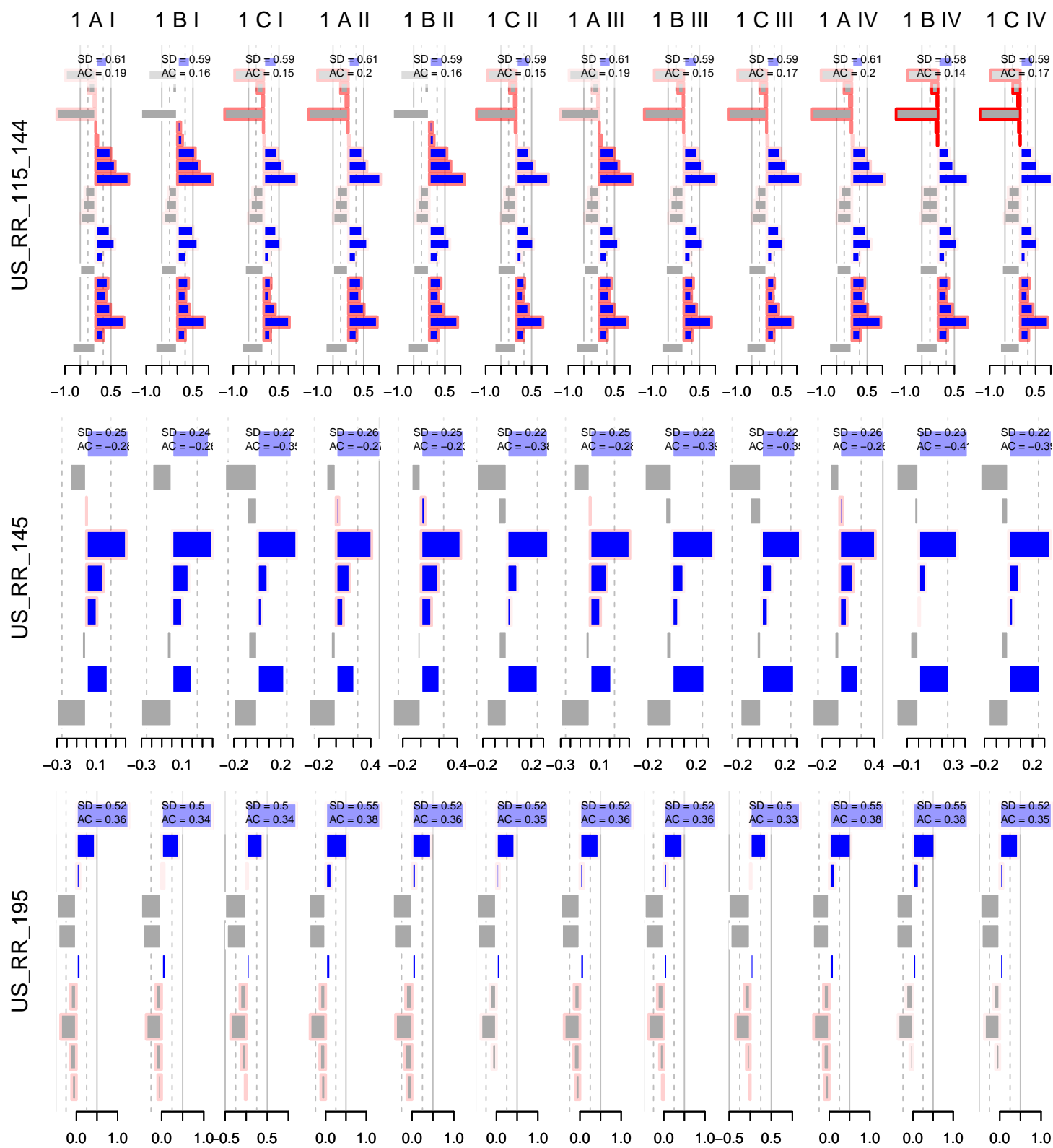
Residuals in indices



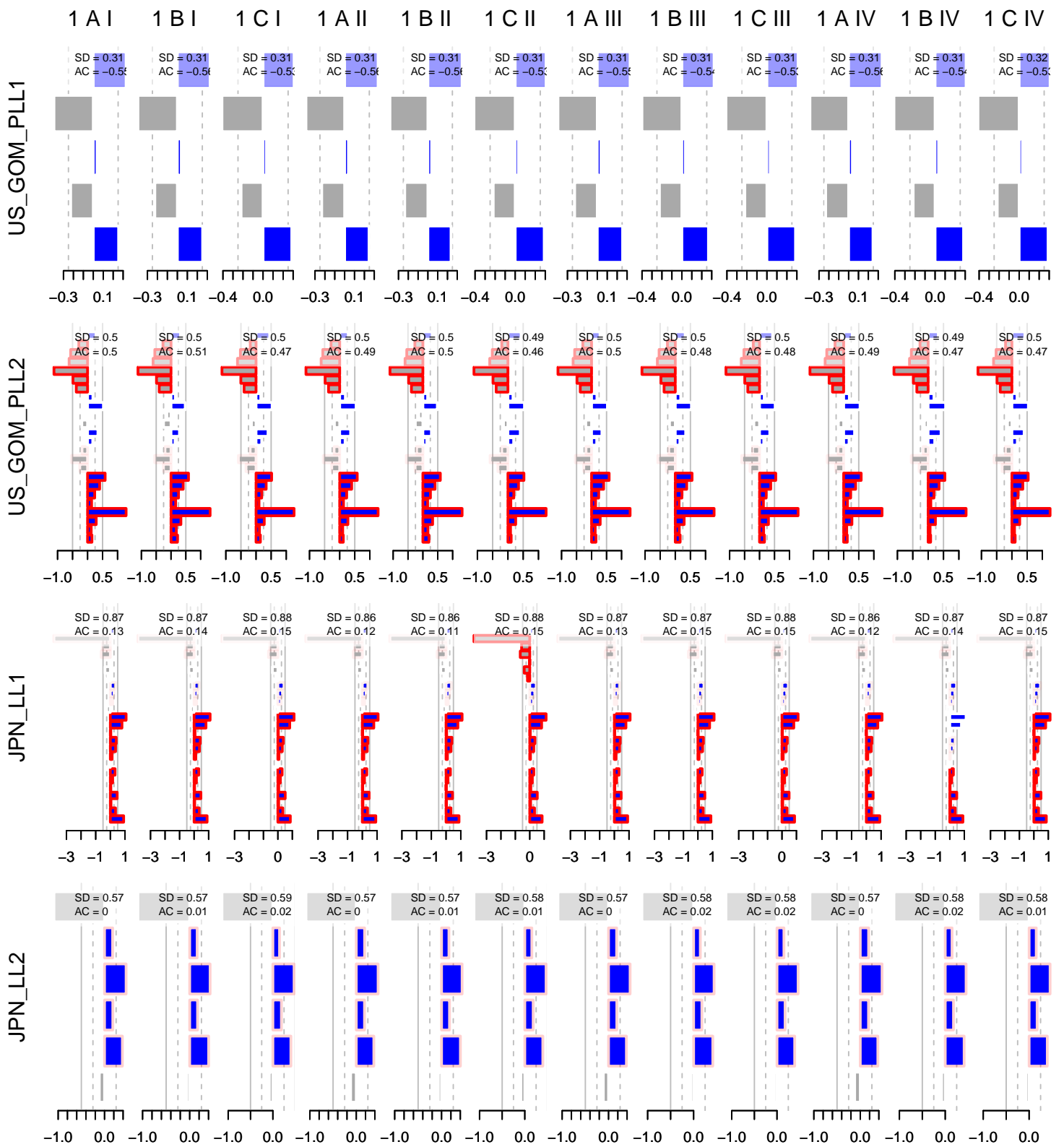
\pagebreak



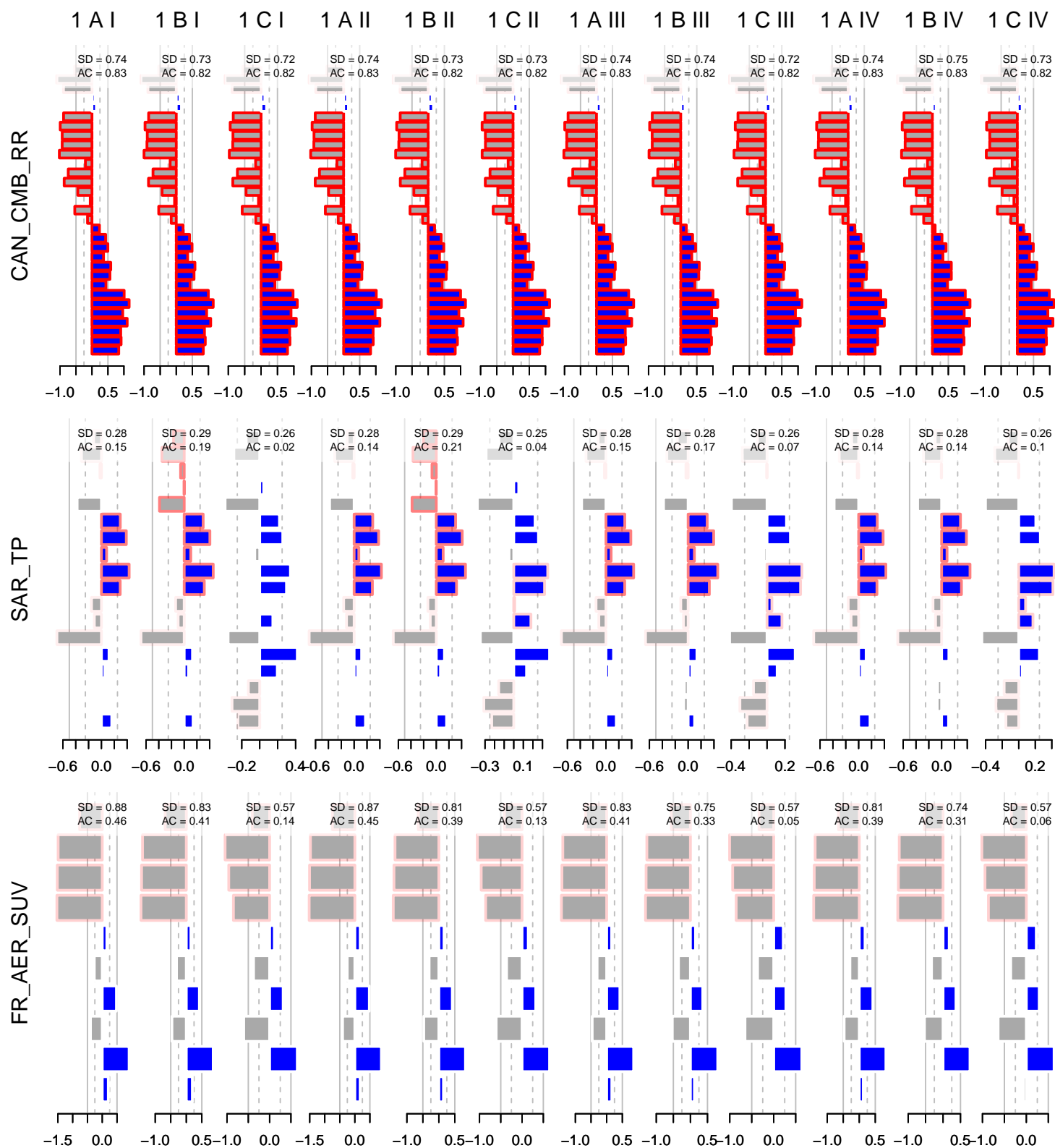
\pagebreak



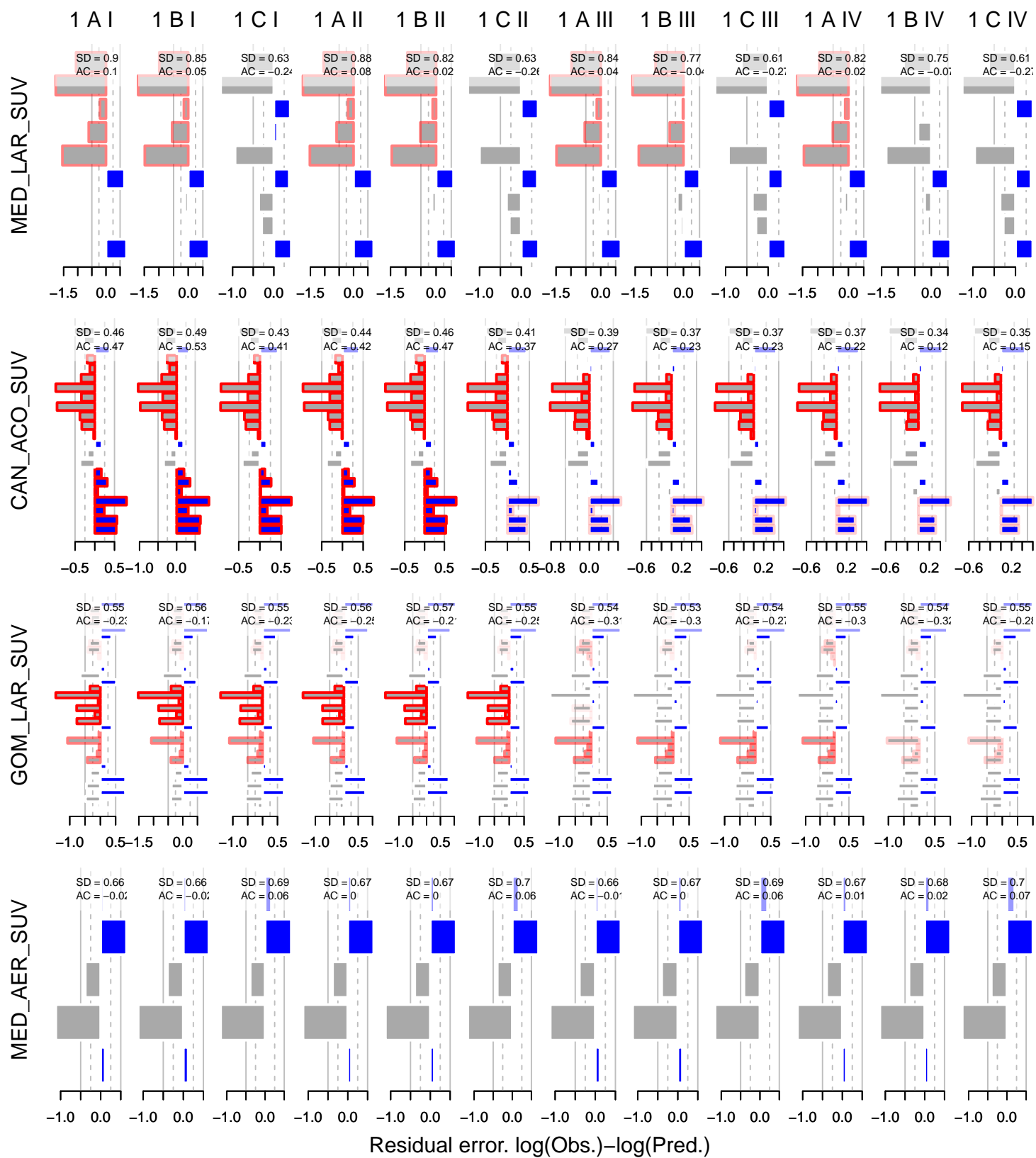
\pagebreak



\pagebreak



 ##
 ## \pagebreak
 ##
 ##
 ## \pagebreak



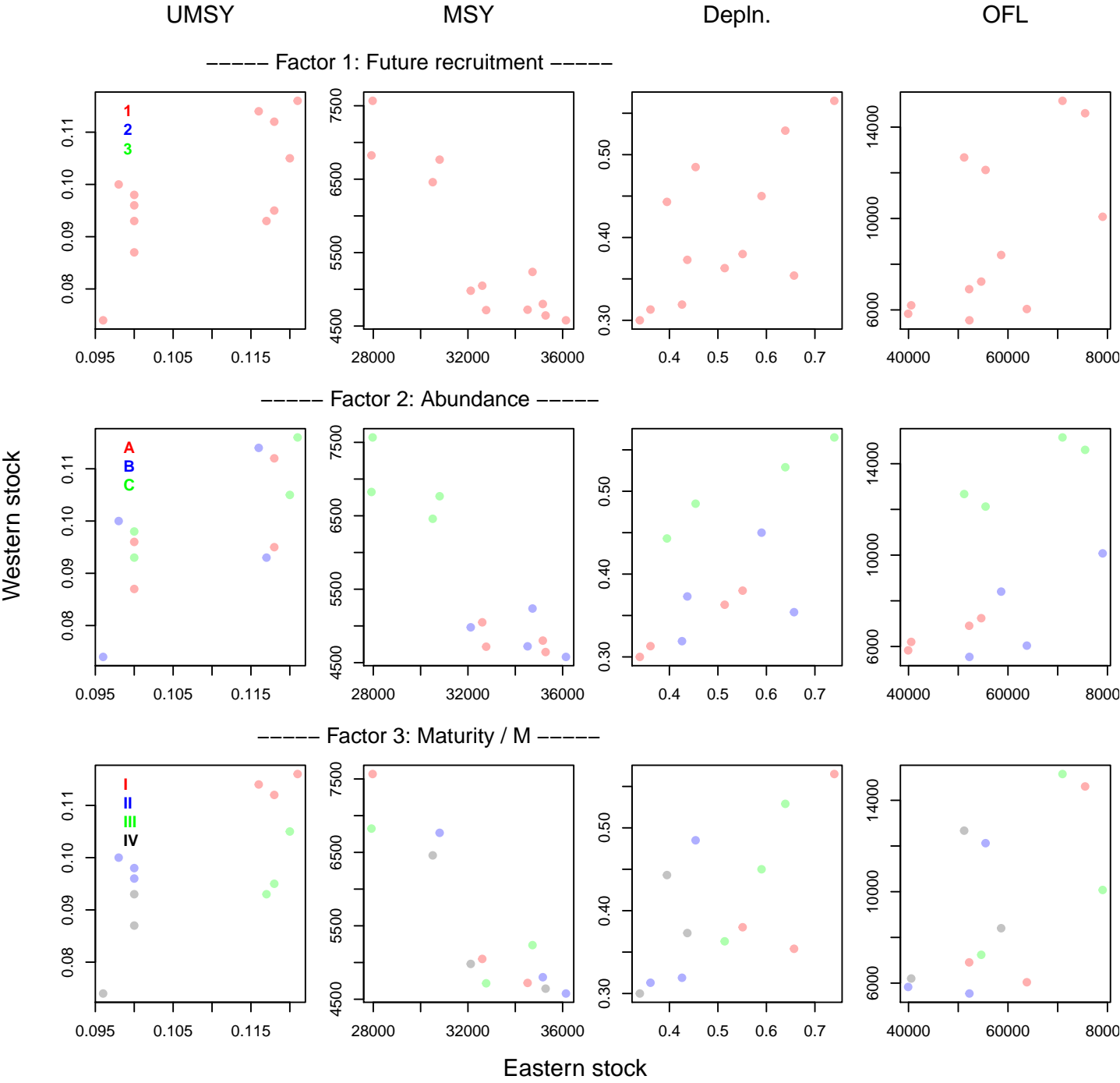
Model estimates / reference points for Eastern stock

OM	MSY	FMSYa	UMSY	BMSY	SSBMSY	BMSY_B0	SSBrel	recMSY	D	Dep	SSB	OFL
1	32605	0.277	0.118	244111	217423	0.304	0.278	0.963	0.507	0.551	394007	52200
4	34520	0.31	0.116	262779	234704	0.31	0.284	0.962	0.608	0.657	491194	63794
7	27973	0.236	0.121	204002	180902	0.294	0.267	0.968	0.685	0.74	553376	75509
10	35163	0.149	0.1	317989	296088	0.31	0.29	0.98	0.338	0.361	371817	39932
13	36141	0.149	0.098	332212	309793	0.315	0.295	0.974	0.401	0.426	497149	52246
16	30804	0.135	0.1	278117	258494	0.302	0.282	0.98	0.427	0.454	515816	55497
19	32771	0.279	0.118	244228	185949	0.304	0.249	0.968	0.474	0.514	352464	54626
22	34728	0.209	0.117	261131	198600	0.298	0.243	0.955	0.548	0.59	513767	79037
25	27924	0.259	0.12	205109	155434	0.299	0.243	0.972	0.592	0.639	448139	70963
28	35281	0.15	0.1	317545	266656	0.31	0.27	0.983	0.318	0.339	340483	40546
31	32118	0.124	0.096	301929	254350	0.307	0.268	0.968	0.413	0.437	514510	58632
34	30512	0.137	0.1	273697	229068	0.302	0.262	0.983	0.371	0.395	428451	51193

Model estimates / reference points for Western stock

OM	MSY	FMSYa	UMSY	BMSY	SSBMSY	BMSY_B0	SSBrel	recMSY	D	Dep	SSB	OFL
1	5049	0.209	0.112	40180	37643	0.325	0.309	0.882	0.347	0.38	57777	6907
4	4722	0.235	0.114	36728	34387	0.324	0.308	0.89	0.323	0.354	49593	6038
7	7567	0.194	0.116	57507	53682	0.313	0.297	0.898	0.524	0.565	117542	14606
10	4800	0.131	0.096	45416	43553	0.327	0.314	0.898	0.291	0.313	58249	5831
13	4578	0.142	0.1	41205	39450	0.32	0.307	0.913	0.296	0.319	53084	5545
16	6766	0.124	0.098	62275	59599	0.317	0.303	0.913	0.457	0.485	118398	12124
19	4717	0.165	0.095	44871	27547	0.363	0.268	0.858	0.332	0.363	46782	7239
22	5237	0.134	0.093	50999	31518	0.359	0.267	0.852	0.417	0.45	66957	10076
25	6824	0.18	0.105	57949	33883	0.343	0.241	0.891	0.49	0.529	84365	15150
28	4644	0.116	0.087	48734	34257	0.352	0.279	0.886	0.278	0.3	50103	6201
31	4981	0.085	0.074	62701	46076	0.372	0.309	0.844	0.352	0.373	83438	8402
34	6459	0.116	0.093	63189	43416	0.333	0.259	0.91	0.418	0.443	93620	12672

MSY reference points



SSB trends

