

Summary contents of the RAM II
stock-recruitment database

*Document for NCEAS working group “Finding Common Ground
in Marine Conservation and Management”*

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October 22, 2008

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Chapter 1

Introduction

In 1995 Ransom A. Myers and colleagues first published a summary of their newly compiled worldwide database of stock-recruitment data for marine species (Myers, R. A., J. Bridson, and N.J. Barrowman. 1995. Summary of Worldwide Spawner and Recruitment Data. Can. Tech. Rep. Fish. Aquat. Sci.2020: iv + 327 p.). This database has since been used in a large number of publications, leading to important advances in fisheries science and ecology (please refer to the following URL for a list of Dr. Myers' publications: <http://as01.ucis.dal.ca/ramweb/content.php?lang=en&i=4&sub=0>). Increasingly, however, analyses became limited by the lack of updating for many of the stocks, providing potentially an outdated picture of the status of marine fisheries.

In early 2008, a group of scientists associated with the National Centre for Ecological Analysis and Synthesis (NCEAS) working group "Finding Common Ground in Marine Conservation and Management" decided to update his database with new stock assessments. This was done in particular to gauge the recovery potential of stocks in relation to current regimes of biomass and fishing mortality. At the same time it was decided to transfer the database to a modern relational database management system using the Structured Query Language (SQL).

This document is meant to support research efforts associated with the NCEAS working group and an associated distributed graduate seminar. The current document contains summary graphs for all stock assessments that are currently loaded in the updated stock-recruitment database under development at Dalhousie University. It is meant as a starting point for feedback. Please provide comments to the contacts given below. Once the database has been completed and feedback incorporated we envision to publish this documents as a technical report and make the database freely available.

DISCLAIMER: This database is under development and the preliminary summary results presented here have not been quality controlled. In particular, all NMFS stocks that were obtained from Mike Fogarty have been transferred into the relational system in an ad-hoc fashion and are still being added to the database. Additionally, we will soon provide better online access to the database. We anticipate and actively encourage contributions of new stocks, updated assessments, and additional information that would complete the data available on each stock.

The current database details can be accessed by NCEAS group members at the following URL: <http://www.marinebiodiversity.ca/RAMlegacy/srdb>

1.1 Contacts

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Chapter 2

Stock-recruitment database summary tables

2.1 Number of assessments per species

Table 2.1: Number of assessments per species.

Common name	Scientific name	# assessments
Acadian redfish	<i>Sebastes fasciatus</i>	1
Albacore tuna	<i>Thunnus alalunga</i>	1
American lobster	<i>Homarus americanus</i>	1
American plaice	<i>Hippoglossoides platessoides</i>	5
Arrowtooth flounder	<i>Reinhardtius stomias</i>	2
Atlantic butterfish	<i>Peprilus triacanthus</i>	1
Atlantic cod	<i>Gadus morhua</i>	29
Atlantic sharpnose shark	<i>Rhizoprionodon terraenovae</i>	1
Australian rockling	<i>Genypterus blacodes</i>	2
Blacknose shark	<i>Carcharhinus acronotus</i>	1
Black rockfish	<i>Sebastes melanops</i>	1
Blacktip shark	<i>Carcharhinus limbatus</i>	1
Blue rockfish	<i>Sebastes mystinus</i>	1
Bocaccio	<i>Sebastes paucispinis</i>	1
Bonnethead shark	<i>Sphyrna tiburo</i>	1
Canary rockfish	<i>Sebastes pinniger</i>	1
Capelin	<i>Mallotus villosus</i>	3
Chilepepper rockfish	<i>Sebastes goodei</i>	1
common European sole	<i>Solea vulgaris</i>	6
common gemfish	<i>Rexea solandri</i>	1
Cowcod	<i>Sebastes levis</i>	1
Darkblotched rockfish	<i>Sebastes crameri</i>	1
Deepwater redfish	<i>Sebastes mentella</i>	1
Dover sole	<i>Microstomus pacificus</i>	1
Dusky rockfish	<i>Sebastes ciliatus</i>	1
English sole	<i>Parophrys vetulus</i>	1
European Plaice	<i>Pleuronectes platessa</i>	8
Flathead sole	<i>Hippoglossoides elassodon</i>	1
Golden Redfish	<i>Sebastes norvegicus</i>	1
Gray triggerfish	<i>Balistes capriscus</i>	1
Greenland halibut	<i>Reinhardtius hippoglossoides</i>	3
Haddock	<i>Melanogrammus aeglefinus</i>	14
Hawaiian morwong	<i>Nemadactylus macropterus</i>	1
Herring	<i>Clupea harengus</i>	14
Hoki	<i>Macruronus novaezelandiae</i>	2
King Mackerel	<i>Scomberomorus cavalla</i>	2
Longnose skate	<i>Raja rhina</i>	1
Mackerel	<i>Scomber scombrus</i>	1
Monkfish	<i>Lophius americanus</i>	2
Northern rockfish	<i>Sebastes polyspinis</i>	1
Northern rock sole	<i>Lepidopsetta polyxystra</i>	1
Norway Pout	<i>Trisopterus esmarkii</i>	2
Pacific cod	<i>Gadus macrocephalus</i>	6
Pacific hake	<i>Merluccius productus</i>	2
Pacific herring	<i>Clupea pallasii</i>	5
Pacific ocean perch	<i>Sebastes alutus</i>	1
Pollock	<i>Pollachius virens</i>	5
Red snapper	<i>Lutjanus campechanus</i>	2
Rex sole	<i>Glyptocephalus zachirus</i>	1
Rougheye rockfish	<i>Sebastes aleutianus</i>	1
Sablefish	<i>Anoplopoma fimbria</i>	1
Sandbar shark	<i>Carcharhinus plumbeus</i>	1
Sand eel	<i>Ammodytes marinus</i>	1
School whiting	<i>Sillago flindersi</i>	1
Sea scallop	<i>Placopecten magellanicus</i>	1
Silverfish	<i>Seriotelella punctata</i>	1
Snow crab	<i>Chionoecetes opilio</i>	1
Spanish mackerel	<i>Scomberomorus maculatus</i>	2
Sprat	<i>Sprattus sprattus</i>	1
Striped bass	<i>Morone saxatilis</i>	1
Summer flounder	<i>Paralichthys dentatus</i>	1
Tautog	<i>Tautoga onitis</i>	1
Tiger flathead	<i>Neoplatycephalus richardsoni</i>	1
Vermilion snapper	<i>Rhomboplites aurorubens</i>	1
Walleye pollock	<i>Theragra chalcogramma</i>	1
Whiting	<i>Merlangius merlangus</i>	4
Widow rockfish	<i>Sebastes entomelas</i>	1
Winter flounder	<i>Pseudopleuronectes americanus</i>	3
Witch flounder	<i>Glyptocephalus cynoglossus</i>	1
Yelloweye rockfish	<i>Sebastes ruberrimus</i>	1
Yellowfin tuna	<i>Thunnus albacares</i>	1
Yellowtail flounder	<i>Limanda ferruginea</i>	4

2.2 Number of assessments per stock

Table 2.2: Number of assessments per species and stock. Note that in some instances there is more than one assessment per stock.

Common name	Scientific name	stockID	# assessments
Acadian redfish	<i>Sebastes fasciatus</i>	ACADREDGOMGB	1
Albacore tuna	<i>Thunnus alalunga</i>	ALBANPAC	1
American lobster	<i>Homarus americanus</i>	LOBSTERRI	1
American plaice	<i>Hippoglossoides platessoides</i>	AMPL3LNO	2
American plaice	<i>Hippoglossoides platessoides</i>	AMPL3M	2
American plaice	<i>Hippoglossoides platessoides</i>	AMPLGOMGB	1
Arrowtooth flounder	<i>Reinhardtius stomias</i>	ARFLOUNDGA	1
Arrowtooth flounder	<i>Reinhardtius stomias</i>	ARFLOUNDPCOAST	1
Atlantic butterflyfish	<i>Peprilus triacanthus</i>	BUTTERGOMCHAT	1
Atlantic cod	<i>Gadus morhua</i>	COD1	1
Atlantic cod	<i>Gadus morhua</i>	COD2J3KL	1
Atlantic cod	<i>Gadus morhua</i>	COD2J3KLIS	1
Atlantic cod	<i>Gadus morhua</i>	COD3NO	3
Atlantic cod	<i>Gadus morhua</i>	COD4T	1
Atlantic cod	<i>Gadus morhua</i>	COD4VsW	1
Atlantic cod	<i>Gadus morhua</i>	COD4X	1
Atlantic cod	<i>Gadus morhua</i>	COD5Z	1
Atlantic cod	<i>Gadus morhua</i>	COD5Zjm	1
Atlantic cod	<i>Gadus morhua</i>	CODBA2532	1
Atlantic cod	<i>Gadus morhua</i>	CODCOASTNOR	2
Atlantic cod	<i>Gadus morhua</i>	CODFAPL	2
Atlantic cod	<i>Gadus morhua</i>	CODGB	1
Atlantic cod	<i>Gadus morhua</i>	CODGOM	1
Atlantic cod	<i>Gadus morhua</i>	CODICE	2
Atlantic cod	<i>Gadus morhua</i>	CODIS	1
Atlantic cod	<i>Gadus morhua</i>	CODKAT	2
Atlantic cod	<i>Gadus morhua</i>	CODNEAR	2
Atlantic cod	<i>Gadus morhua</i>	CODNS	2
Atlantic cod	<i>Gadus morhua</i>	CODVIa	2
Atlantic sharpnose shark	<i>Rhizoprionodon terraenovae</i>	SNOSESHARATL	1
Australian rockling	<i>Genypterus blacodes</i>	PINKLINGGABSESSF	1
Australian rockling	<i>Genypterus blacodes</i>	PINKLINGSESSF	1
Blacknose shark	<i>Carcharhinus acronotus</i>	BNOSESHARATL	1
Black rockfish	<i>Sebastes melanops</i>	BLACKROCKNP	1
Blacktip shark	<i>Carcharhinus limbatus</i>	BTIPSHARSATL	1
Blue rockfish	<i>Sebastes mystinus</i>	BLUEROCKCAL	1
Bocaccio	<i>Sebastes paucispinis</i>	BOCACCSPOCOAST	1
Bonnethead shark	<i>Sphyrna tiburo</i>	BHEADSHARATL	1
Canary rockfish	<i>Sebastes pinniger</i>	CROCKPCOAST	1
Capelin	<i>Mallotus villosus</i>	CAPEICE	2
Capelin	<i>Mallotus villosus</i>	CAPENOR	1
Chilipepper rockfish	<i>Sebastes goodei</i>	CHILISPCOAST	1
common European sole	<i>Solea vulgaris</i>	SOLEIS	2
common European sole	<i>Solea vulgaris</i>	SOLENS	2
common European sole	<i>Solea vulgaris</i>	SOLEVIId	2
common gemfish	<i>Rexea solandri</i>	GEMFISHSESSF	1
Cowcod	<i>Sebastes levis</i>	COWCODSCAL	1
Darkblotched rockfish	<i>Sebastes crameri</i>	DKROCKPCOAST	1
Deepwater redfish	<i>Sebastes mentella</i>	REDDEEPLII	1
Dover sole	<i>Microstomus pacificus</i>	DSOLEGA	1
Dusky rockfish	<i>Sebastes ciliatus</i>	DUSKYROCKGA	1
English sole	<i>Parophrys vetulus</i>	ESOLEPCOAST	1
European Plaice	<i>Pleuronectes platessa</i>	PLAIC7d	2
European Plaice	<i>Pleuronectes platessa</i>	PLAICIIIa	2
European Plaice	<i>Pleuronectes platessa</i>	PLAICIS	2
European Plaice	<i>Pleuronectes platessa</i>	PLAICNS	2
Flathead sole	<i>Hippoglossoides elassodon</i>	FLSOLEGA	1
Cont.			

Table 2.2 – continued

Common name	Scientific name	stockID	# assessments
Golden Redfish	<i>Sebastes norvegicus</i>	GOLDREDNEAR	1
Gray triggerfish	<i>Balistes capriscus</i>	GTRIGGM	1
Greenland halibut	<i>Reinhardtius hippoglossoides</i>	GHAL23KLMNO	1
Greenland halibut	<i>Reinhardtius hippoglossoides</i>	GHALNEAR	2
Haddock	<i>Melanogrammus aeglefinus</i>	HAD4X5Y	1
Haddock	<i>Melanogrammus aeglefinus</i>	HAD5Zejm	1
Haddock	<i>Melanogrammus aeglefinus</i>	HADFAPL	2
Haddock	<i>Melanogrammus aeglefinus</i>	HADGB	1
Haddock	<i>Melanogrammus aeglefinus</i>	HADICE	2
Haddock	<i>Melanogrammus aeglefinus</i>	HADIS	2
Haddock	<i>Melanogrammus aeglefinus</i>	HADNEAR	2
Haddock	<i>Melanogrammus aeglefinus</i>	HADNS-IIIa	1
Haddock	<i>Melanogrammus aeglefinus</i>	HADVIa	2
Hawaiian morwong	<i>Nemadactylus macropterus</i>	MORWONGSESSF	1
Herring	<i>Clupea harengus</i>	HERR2224IIIa	1
Herring	<i>Clupea harengus</i>	HERR4RFA	1
Herring	<i>Clupea harengus</i>	HERR4RSP	1
Herring	<i>Clupea harengus</i>	HERR4VWX	1
Herring	<i>Clupea harengus</i>	HERRIsum	2
Herring	<i>Clupea harengus</i>	HERRNIRS	2
Herring	<i>Clupea harengus</i>	HERRNS	2
Herring	<i>Clupea harengus</i>	HERRNWATLC	1
Herring	<i>Clupea harengus</i>	HERRVIa	1
Herring	<i>Clupea harengus</i>	HERRVIaVIIbc	2
Hoki	<i>Macruronus novaezelandiae</i>	HOKIENZ	1
Hoki	<i>Macruronus novaezelandiae</i>	HOKIWNZ	1
King Mackerel	<i>Scomberomorus cavalla</i>	KMACKGM	1
King Mackerel	<i>Scomberomorus cavalla</i>	KMACKSATLC	1
Longnose skate	<i>Raja rhina</i>	LNOSKAPCOAST	1
Mackerel	<i>Scomber scombrus</i>	MACKGOMCHATT	1
Monkfish	<i>Lophius americanus</i>	MONKGOMNGB	1
Monkfish	<i>Lophius americanus</i>	MONKSGBMATL	1
Northern rockfish	<i>Sebastes polyspinis</i>	NROCKGA	1
Northern rock sole	<i>Lepidopsetta polyxystra</i>	NRSOLEEBSAI	1
Norway Pout	<i>Trisopterus esmarkii</i>	NPOUTNS	2
Pacific cod	<i>Gadus macrocephalus</i>	PCODGA	3
Pacific cod	<i>Gadus macrocephalus</i>	PCODHS	2
Pacific cod	<i>Gadus macrocephalus</i>	PCODWCVANI	1
Pacific hake	<i>Merluccius productus</i>	PHAKEPCOAST	2
Pacific herring	<i>Clupea pallasii</i>	HERRCC	1
Pacific herring	<i>Clupea pallasii</i>	HERRPRD	1
Pacific herring	<i>Clupea pallasii</i>	HERRQCI	1
Pacific herring	<i>Clupea pallasii</i>	HERRSOG	1
Pacific herring	<i>Clupea pallasii</i>	HERRWCVANI	1
Pacific ocean perch	<i>Sebastes alutus</i>	POPERCHPCOAST	1
Pollock	<i>Pollachius virens</i>	POLL4VWX5Zc	1
Pollock	<i>Pollachius virens</i>	POLLFAPL	1
Pollock	<i>Pollachius virens</i>	POLLNEAR	2
Pollock	<i>Pollachius virens</i>	POLLNS-VI-IIIa	1
Red snapper	<i>Lutjanus campechanus</i>	RSNAPEGM	1
Red snapper	<i>Lutjanus campechanus</i>	RSNAPWGM	1
Rex sole	<i>Glyptocephalus zachirus</i>	REXSOLEGA	1
Rougheye rockfish	<i>Sebastes aleutianus</i>	REYEROCKGA	1
Sablefish	<i>Anoplopoma fimbria</i>	SABLEFPCOAST	1
Sandbar shark	<i>Carcharhinus plumbeus</i>	SBARSHARATL	1
Sand eel	<i>Ammodytes marinus</i>	SEELNS	1
School whiting	<i>Sillago flindersi</i>	SWHITSESSF	1
Sea scallop	<i>Placopecten magellanicus</i>	SCALLNWATLC	1
Silverfish	<i>Seriola punctata</i>	SILVERFISHSESSF	1
Cont.			

Table 2.2 – continued			
Common name	Scientific name	stockID	# assessments
Snow crab	<i>Chionoecetes opilio</i>	SNOWCRABBS	1
Spanish mackerel	<i>Scomberomorus maculatus</i>	SPANMACKGM	1
Spanish mackerel	<i>Scomberomorus maculatus</i>	SPANMACKSATLC	1
Sprat	<i>Sprattus sprattus</i>	SPRATNS	1
Striped bass	<i>Morone saxatilis</i>	STRIPEDBASSGOMCHATT	1
Summer flounder	<i>Paralichthys dentatus</i>	SFLOUNMATLC	1
Tautog	<i>Tautoga onitis</i>	TAUTOGRI	1
Tiger flathead	<i>Neoplatycephalus richardsoni</i>	TIGERFLATSESSF	1
Vermilion snapper	<i>Rhomboplites aurorubens</i>	VSNAPGM	1
Walleye pollock	<i>Theragra chalcogramma</i>	WPOLLGA	1
Whiting	<i>Merlangius merlangus</i>	WHITBLACKW	1
Whiting	<i>Merlangius merlangus</i>	WHITNS-VIIIa-IIIa	1
Whiting	<i>Merlangius merlangus</i>	WHITVIa	2
Widow rockfish	<i>Sebastes entomelas</i>	WROCKPCOAST	1
Winter flounder	<i>Pseudopleuronectes americanus</i>	WINFLOUNDRI	1
Winter flounder	<i>Pseudopleuronectes americanus</i>	WINFLOUNGOM	1
Winter flounder	<i>Pseudopleuronectes americanus</i>	WINFLOUNSNMATL	1
Witch flounder	<i>Glyptocephalus cynoglossus</i>	WITFLOUNNWATLC	1
Yelloweye rockfish	<i>Sebastes ruberrimus</i>	YEYEROCKPCOAST	1
Yellowfin tuna	<i>Thunnus albacares</i>	YFINEPAC	1
Yellowtail flounder	<i>Limanda ferruginea</i>	YELL5Z	1
Yellowtail flounder	<i>Limanda ferruginea</i>	YELLCCODGOM	1
Yellowtail flounder	<i>Limanda ferruginea</i>	YELLGB	1
Yellowtail flounder	<i>Limanda ferruginea</i>	YELLSNEMATL	1

Chapter 3

Summary plots

3.1 Template plots with descriptions

For each assessment present in the stock-recruitment database where time-series data is present, a summary page containing four plots is generated. Each page follows a similar layout. The top-left plot shows the temporal trend in spawning stock biomass and/or CPUE and in fishing mortality. The top-right plot shows the stock-recruitment relationship with fitted Ricker and Beverton-Holt models, assuming gamma error structure. The bottom-left plot shows the spawning stock biomass vs. fishing mortality phase diagram. When available, biomass and fishing mortality reference points are also added. Finally, the bottom-right plot shows the temporal exploitation history of the stock using total catch and/or landings. Please refer to Figure 3.1 for plot legends.

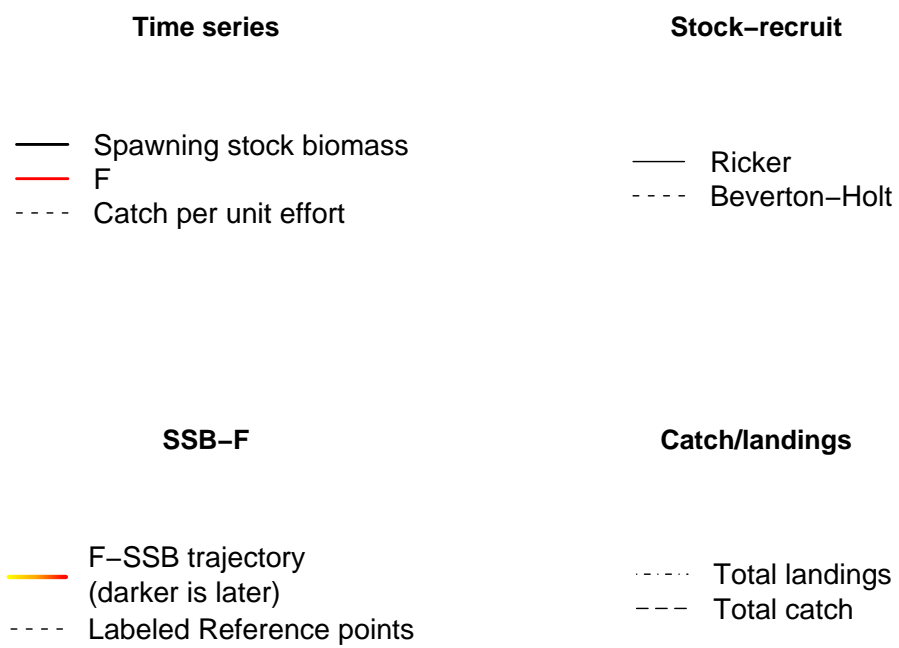
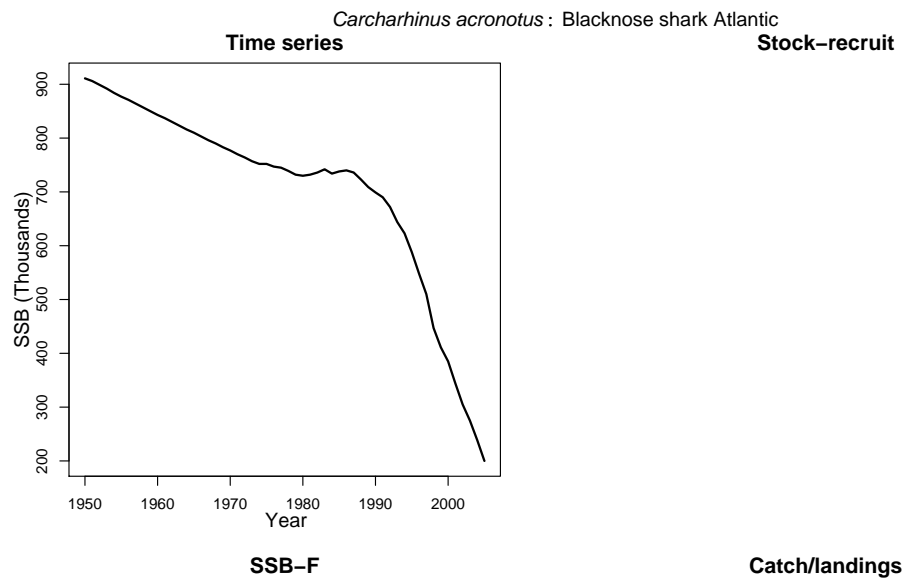


Figure 3.1: Line type specification for summary plots.

3.2 Carcharhiniformes

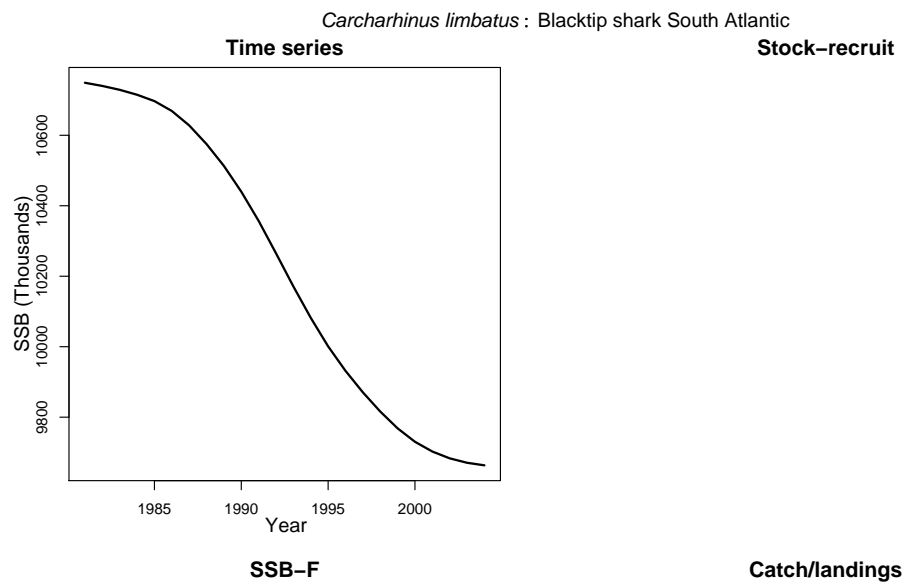
3.2.1 Carcharhinidae

Carcharhinus acronotus - Blacknose shark



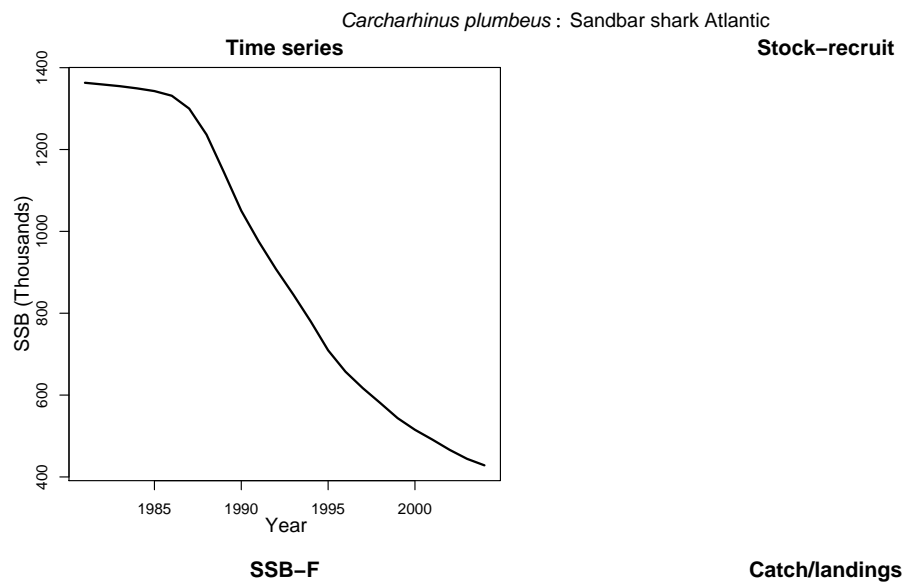
NMFS-BNOSESHARATL-2006-FOGARTY

Carcharhinus limbatus - Blacktip shark



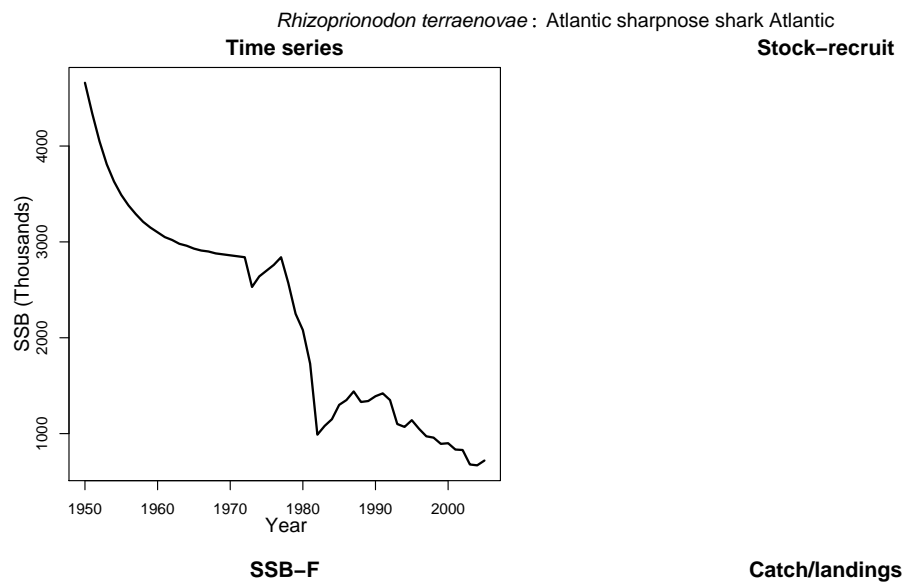
NMFS-BTIPSHARSATL-2006-FOGARTY

Carcharhinus plumbeus - Sandbar shark



NMFS-SBARSHARATL-2006-FOGARTY

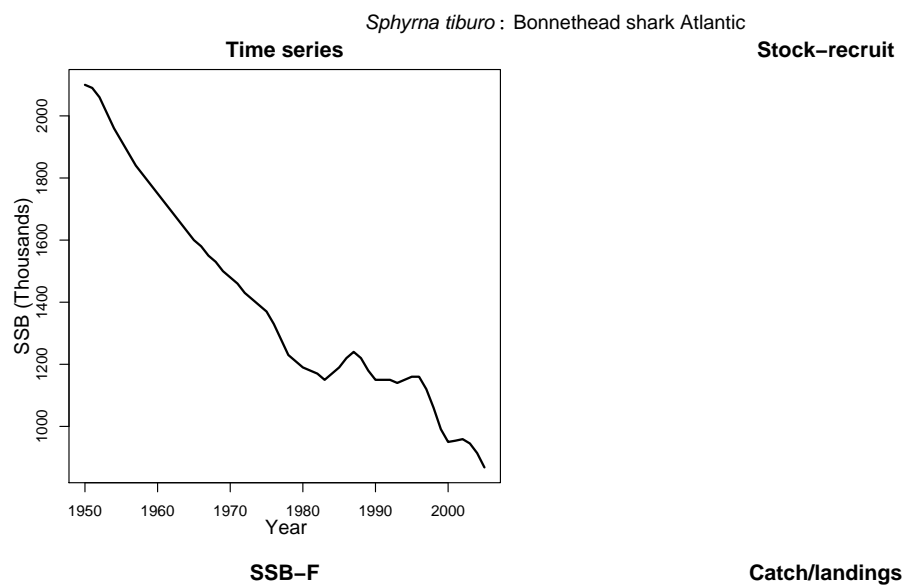
Rhizoprionodon terraenovae - Atlantic sharpnose shark



NMFS-SNOSESHARATL-2006-FOGARTY

3.2.2 Sphyrnidae

Sphyrna tiburo - Bonnethead shark



NMFS-BHEADSHARATL-2006-FOGARTY

3.3 Clupeiformes

3.3.1 Clupeidae

Clupea harengus - Herring

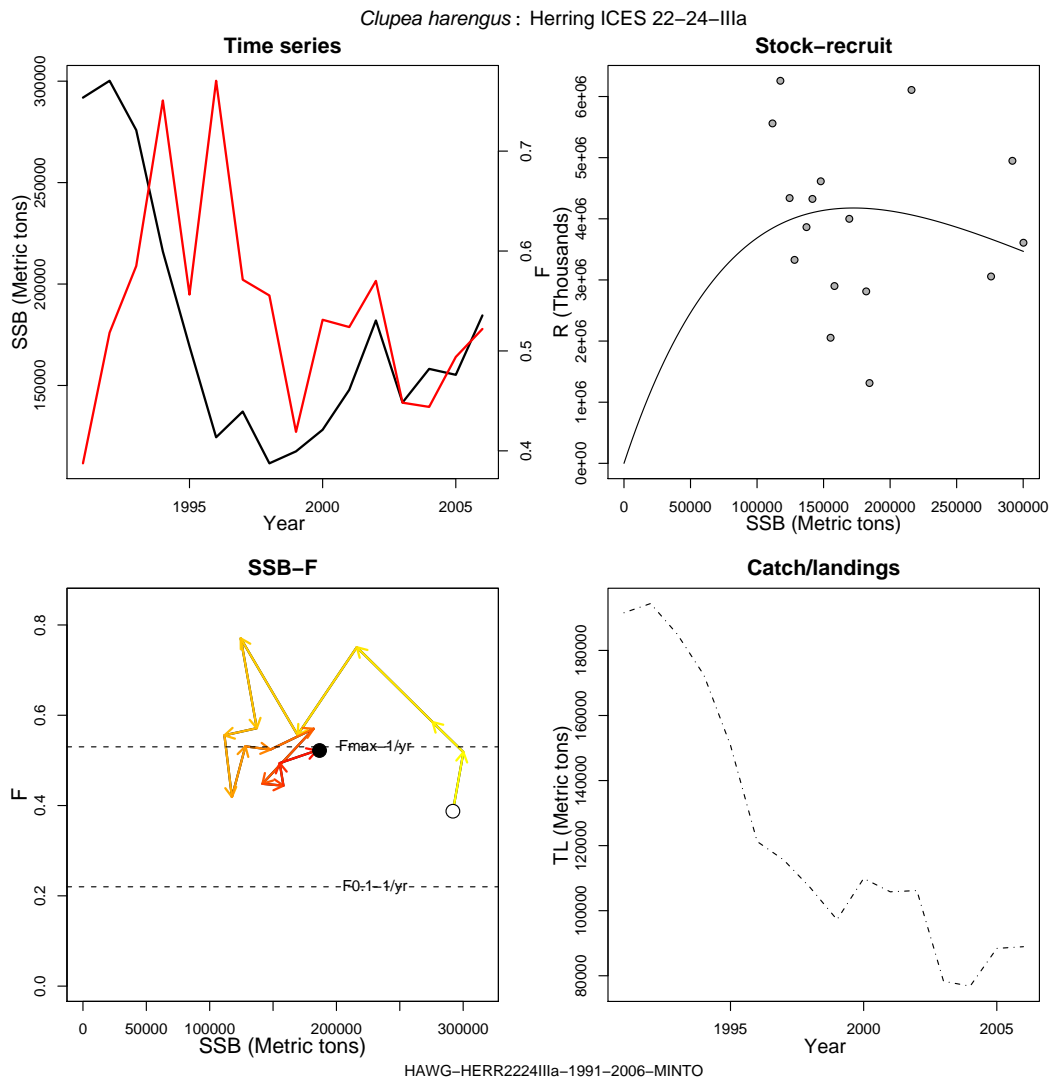
Clupea harengus : Atlantic herring Northwestern Atlantic Coast
Time series **Stock-recruit**

SSB-F

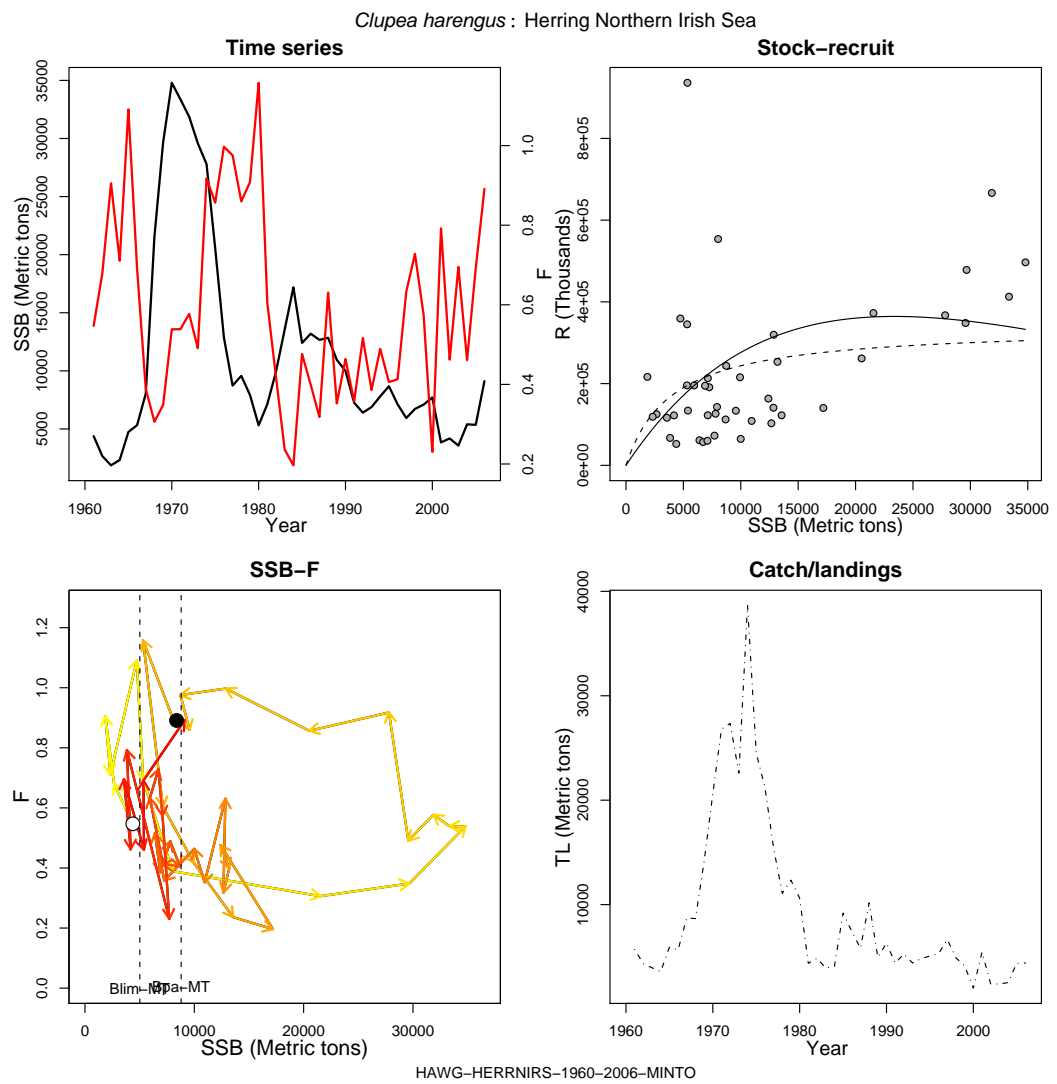
Catch/landings

NMFS-HERRNWATLC-2006-FOGARTY

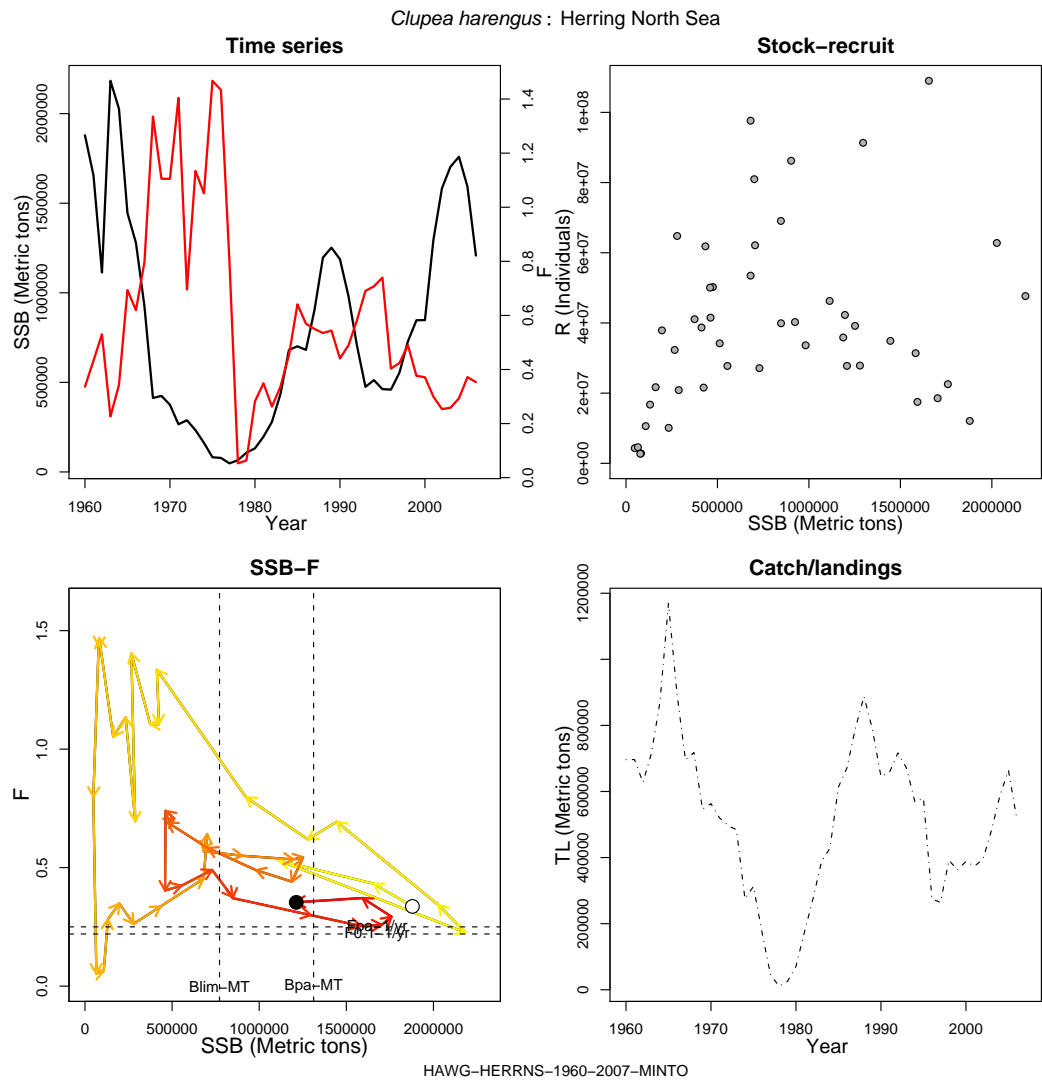
Clupea harengus - Herring



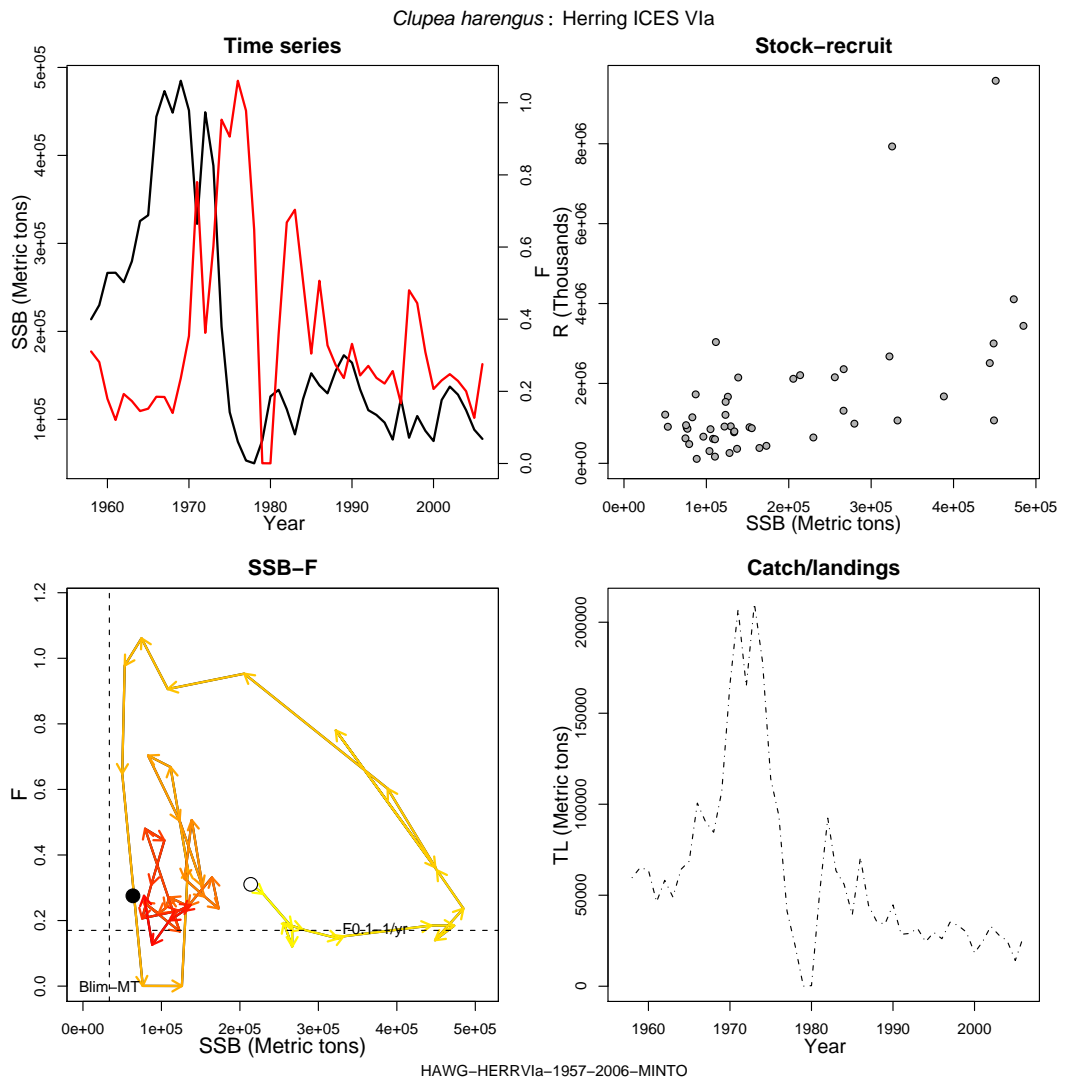
Clupea harengus - Herring



Clupea harengus - Herring

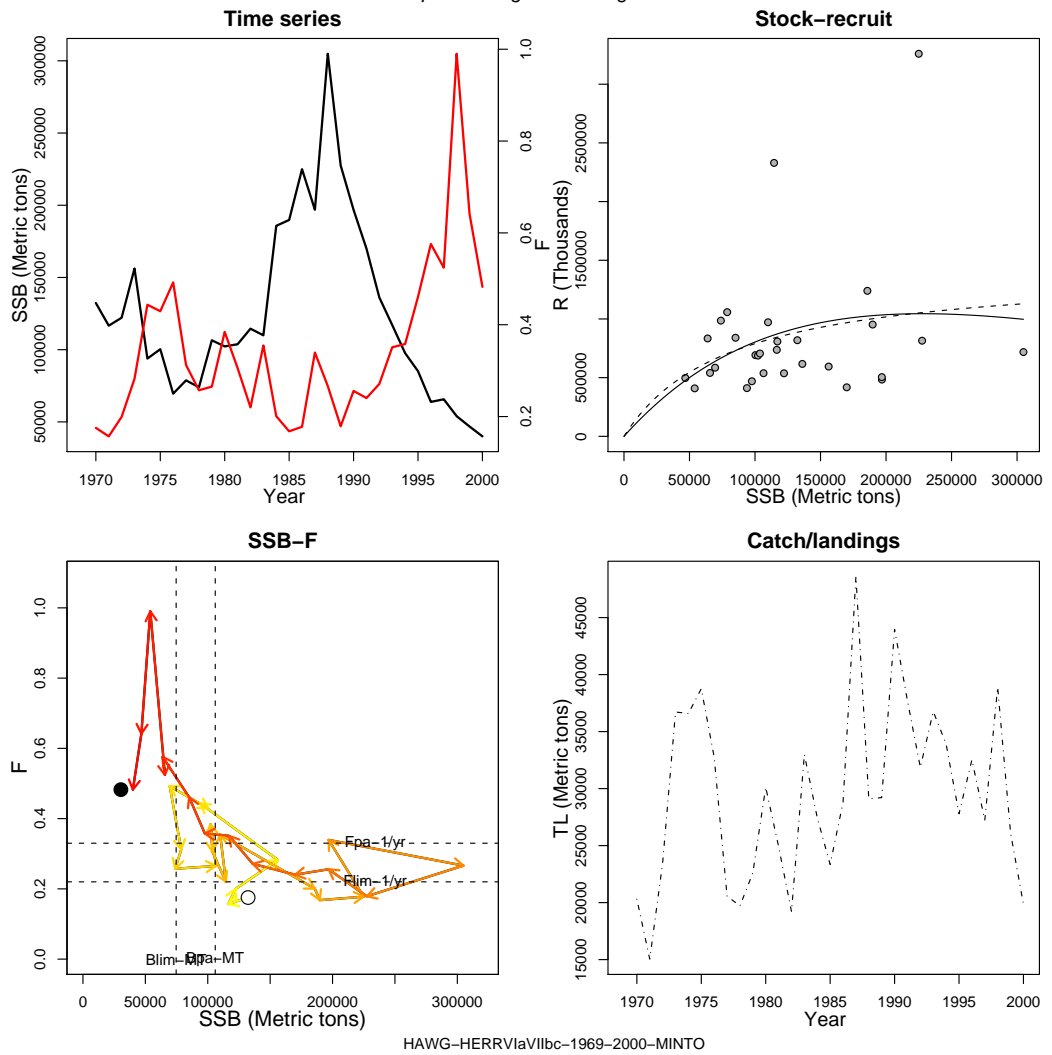


Clupea harengus - Herring

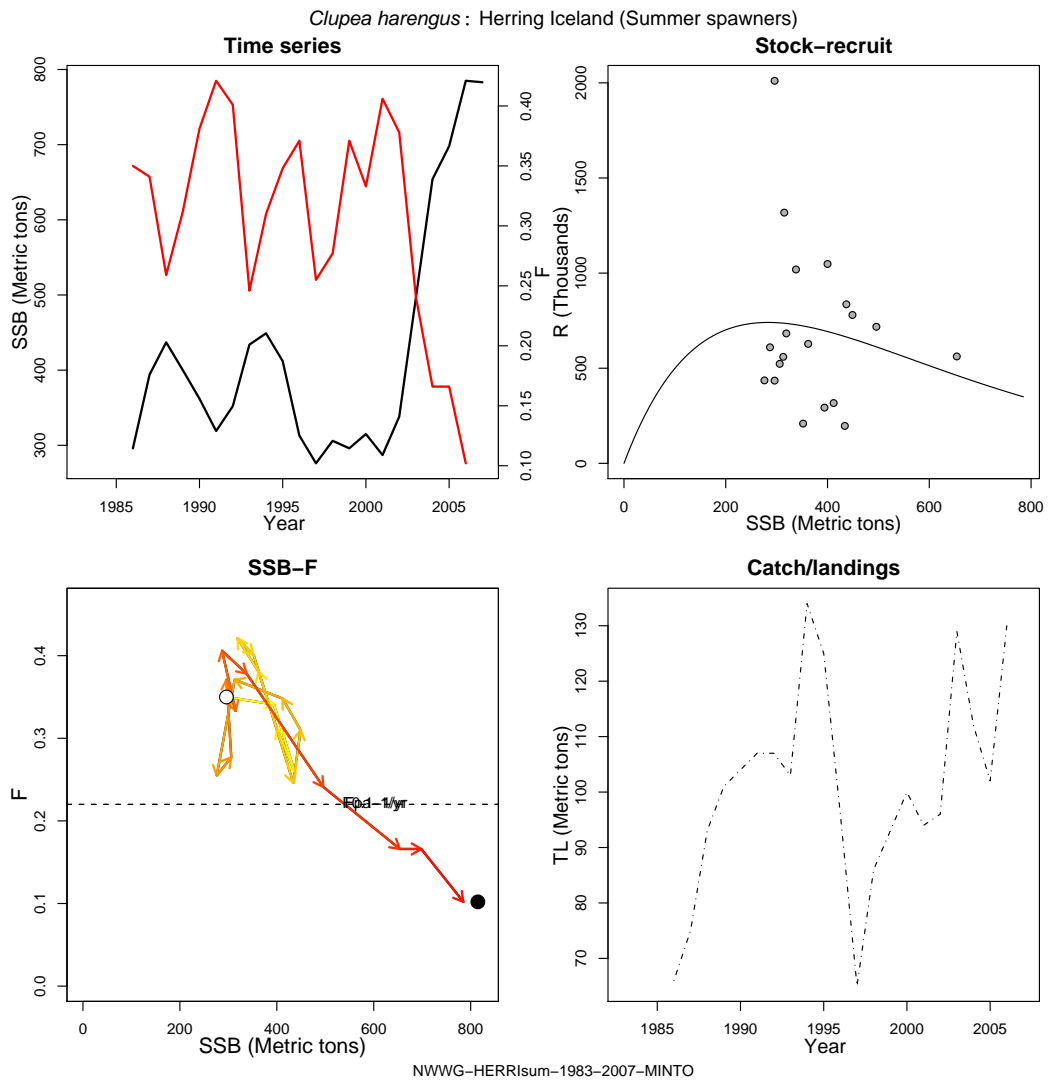


Clupea harengus - Herring

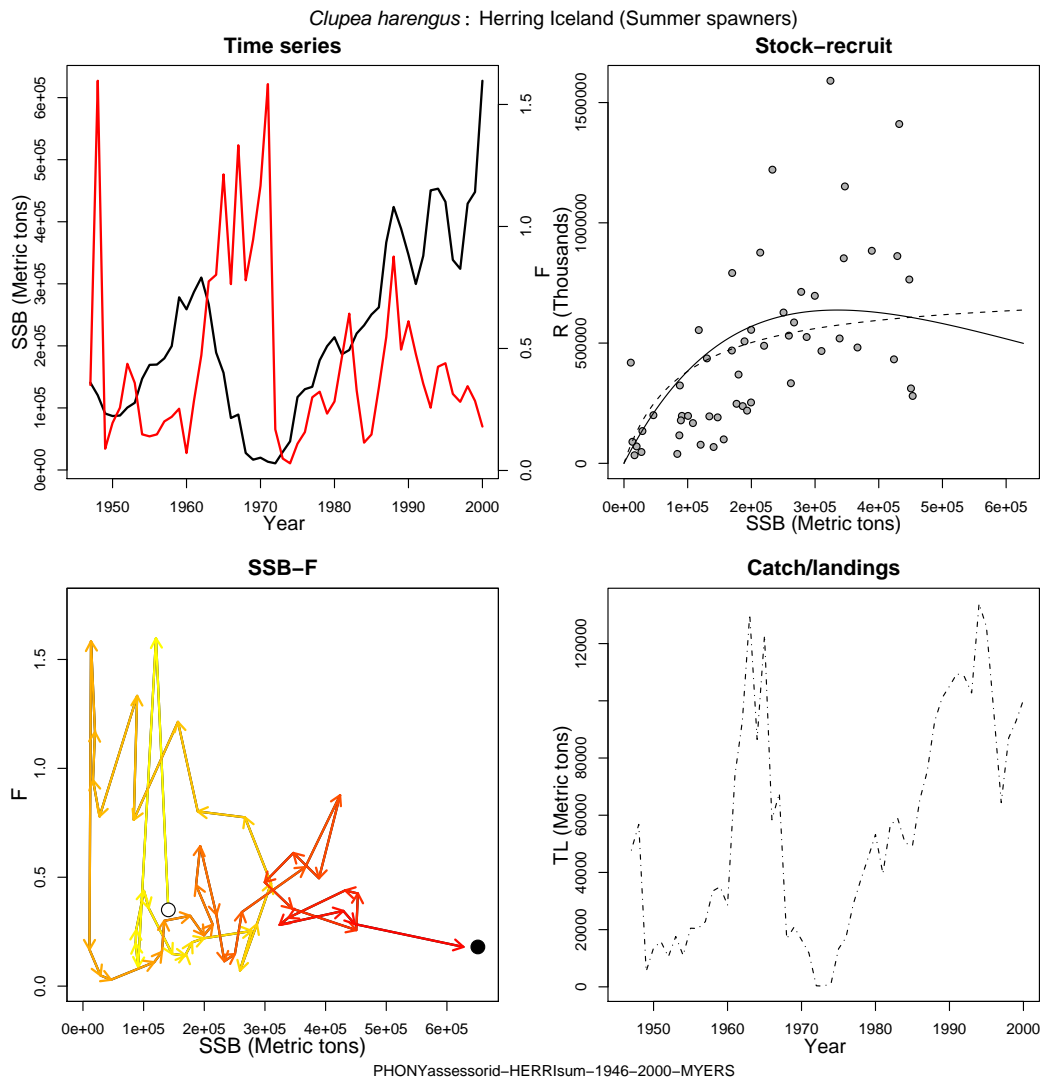
Clupea harengus : Herring ICES VIa



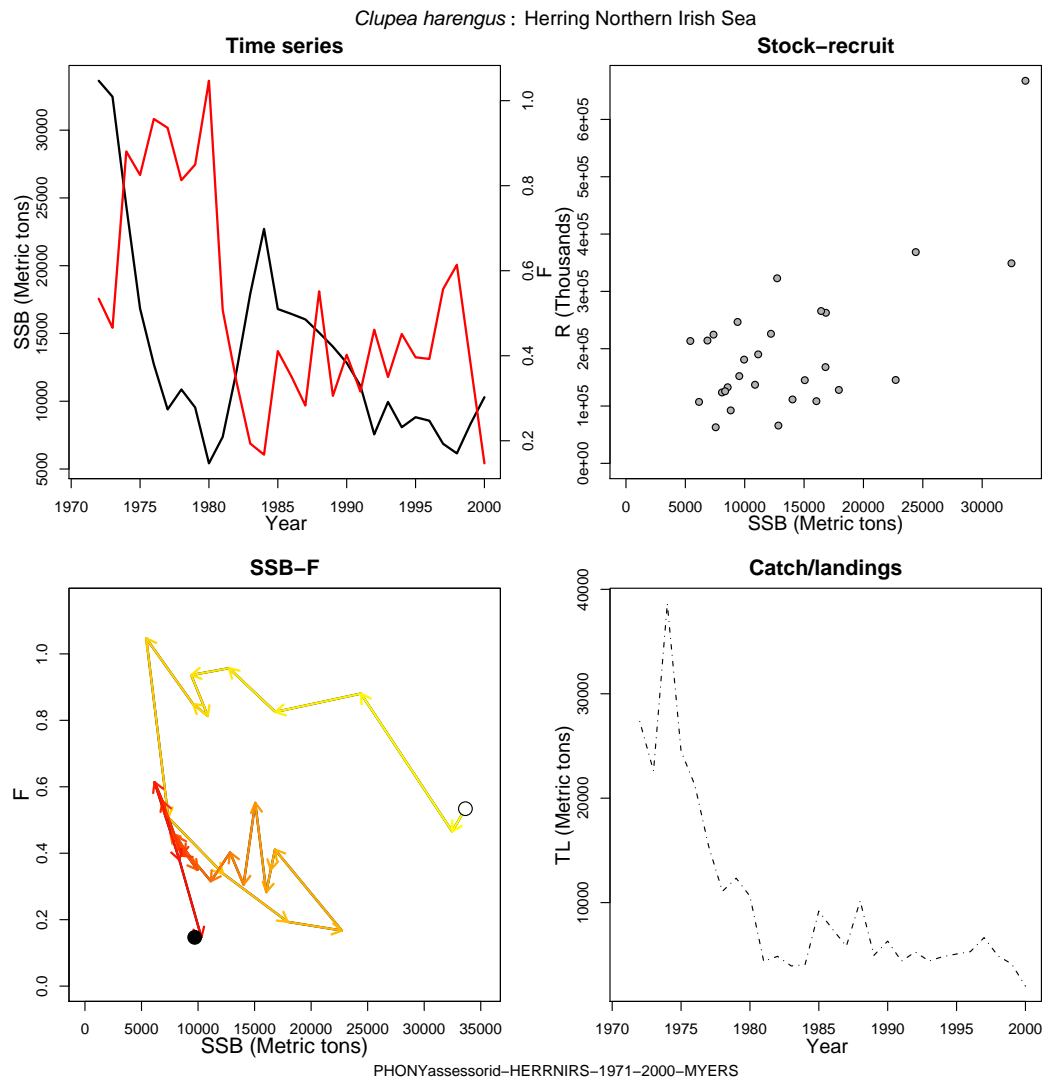
Clupea harengus - Herring



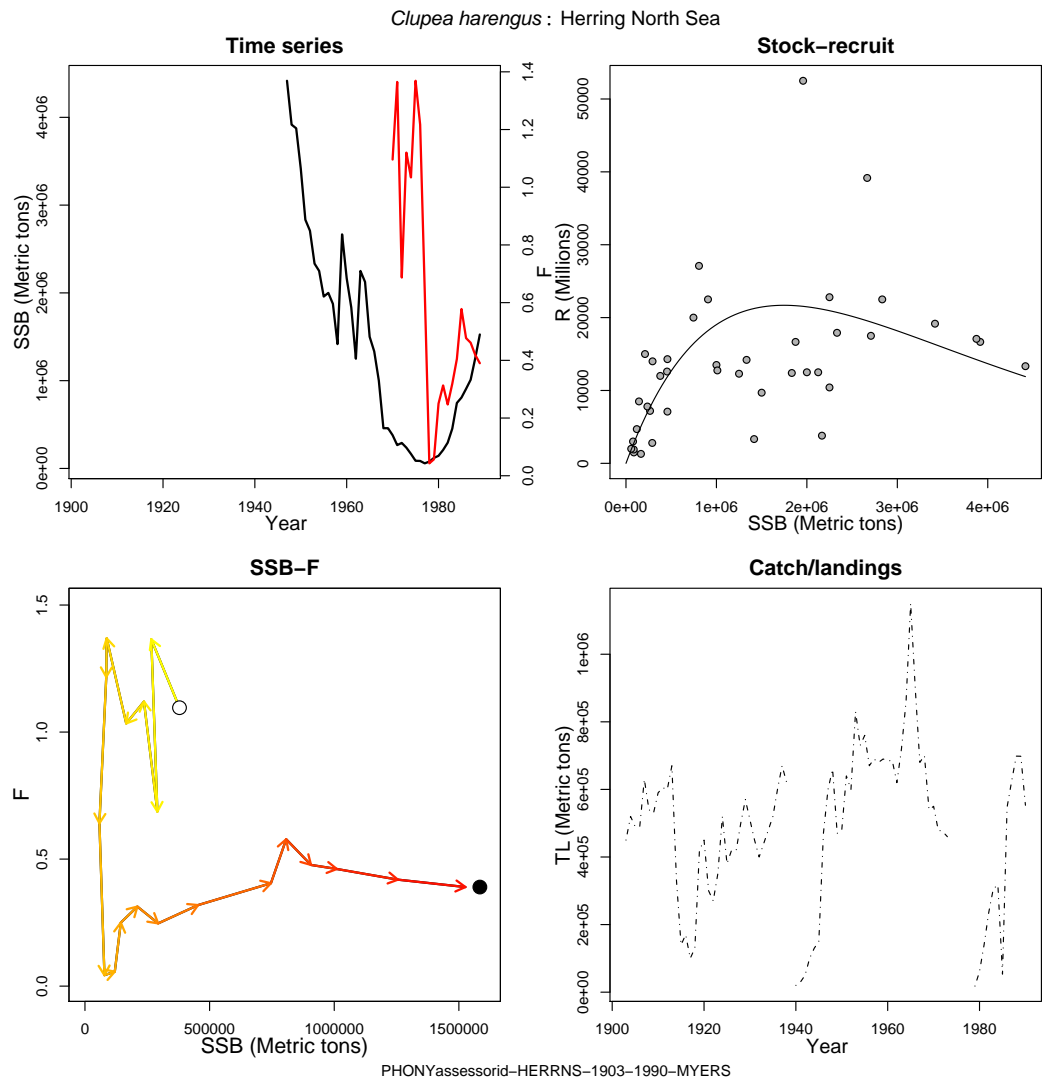
Clupea harengus - Herring



Clupea harengus - Herring

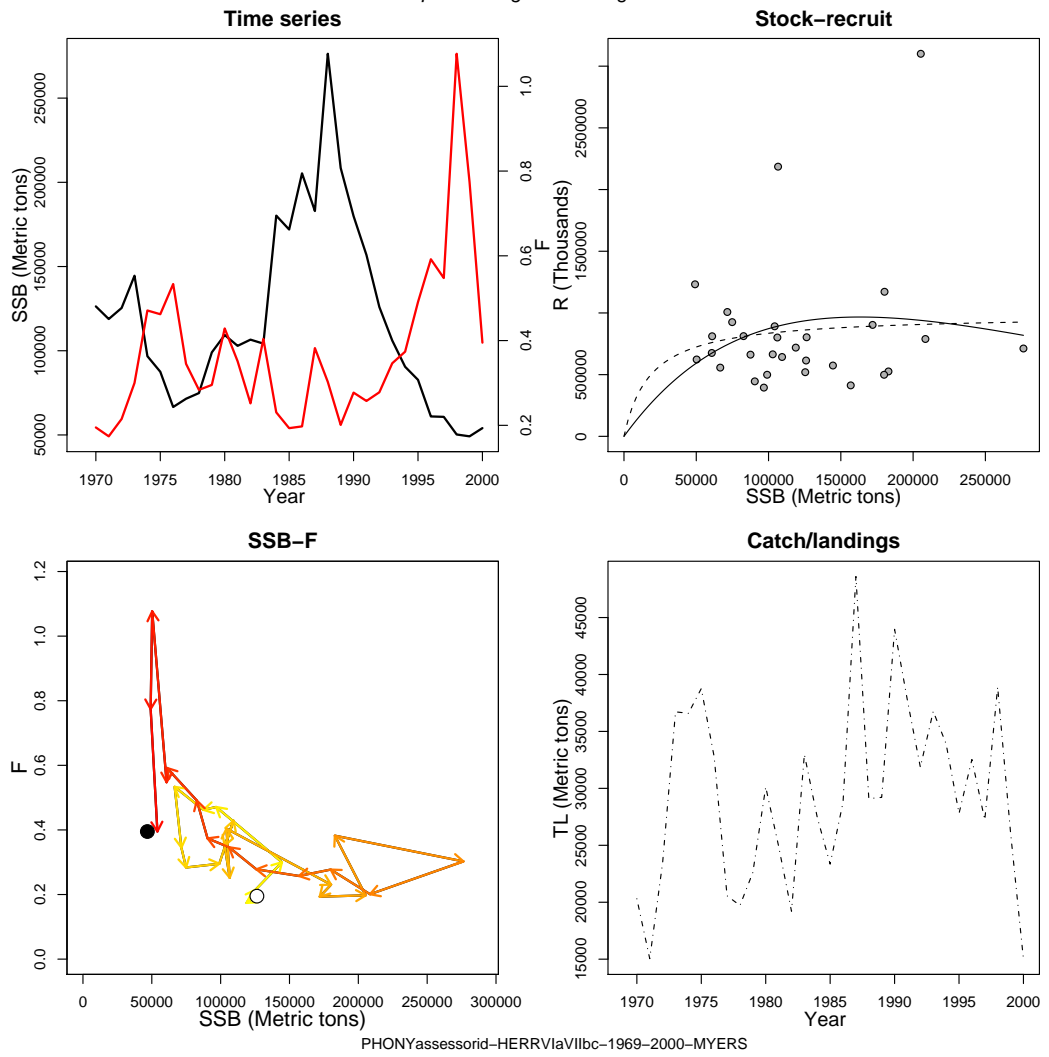


Clupea harengus - Herring



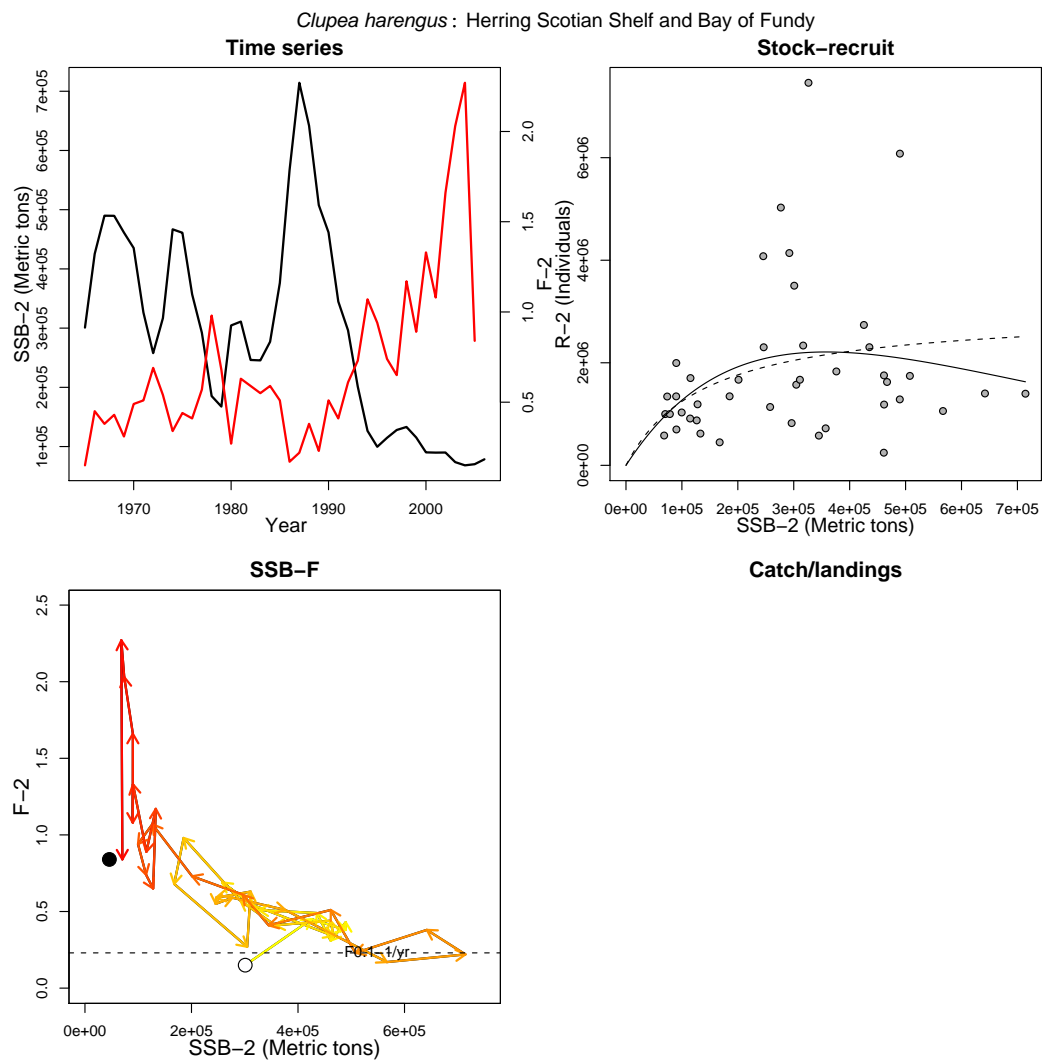
Clupea harengus - Herring

Clupea harengus : Herring ICES VIa



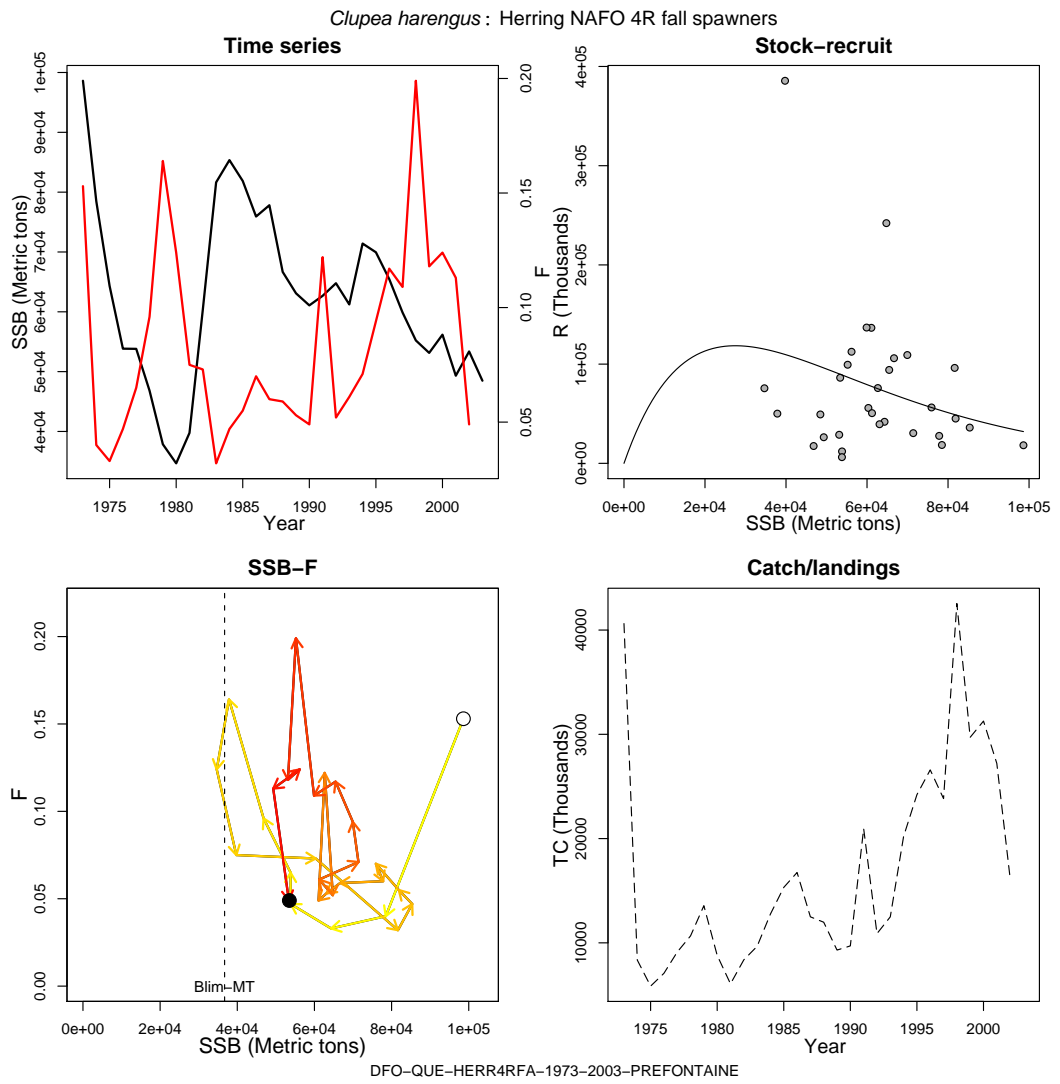
PHONYassessorid-HERRVIaVIIbc-1969-2000-MYERS

Clupea harengus - Herring

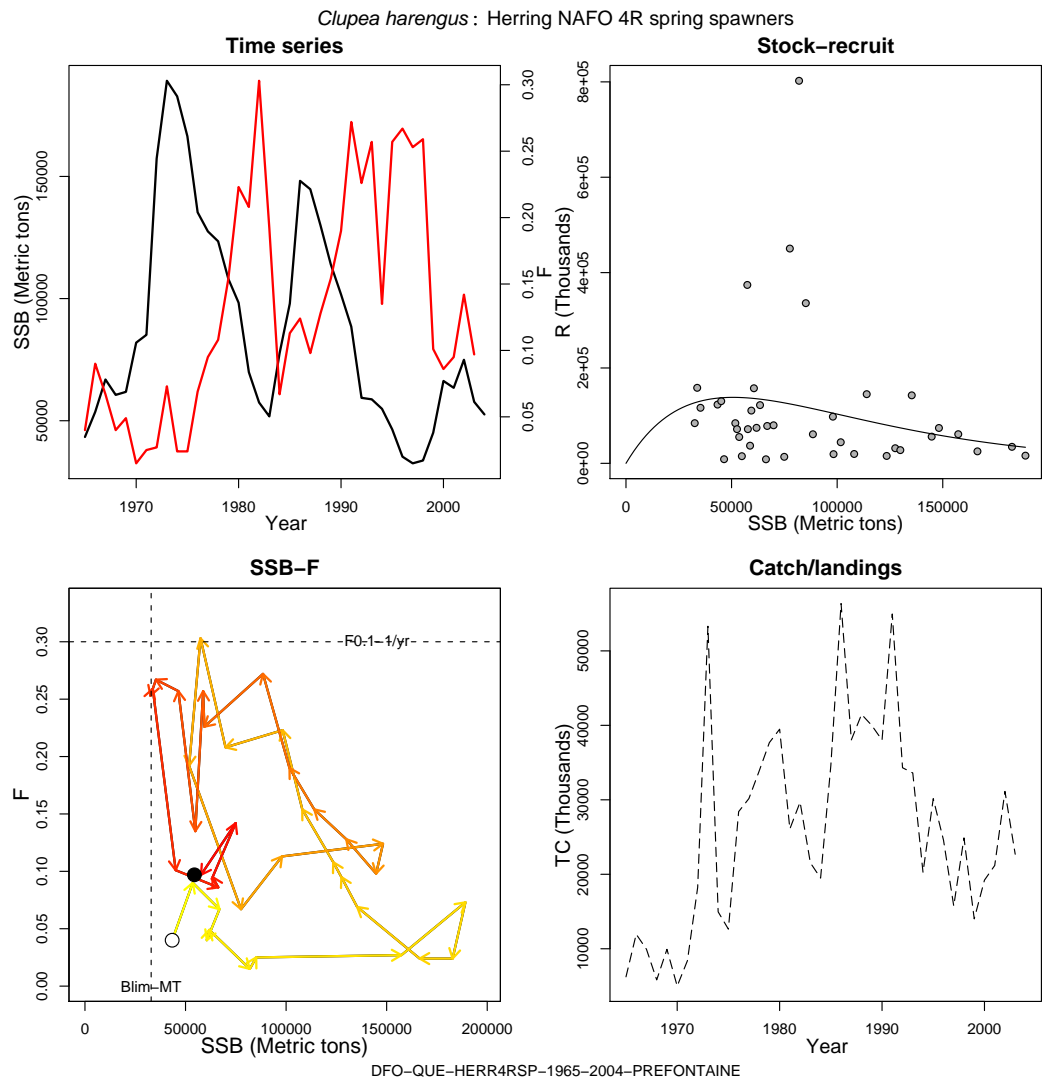


DFO-HERR4VWX-1965-2006-PREFONTAINE

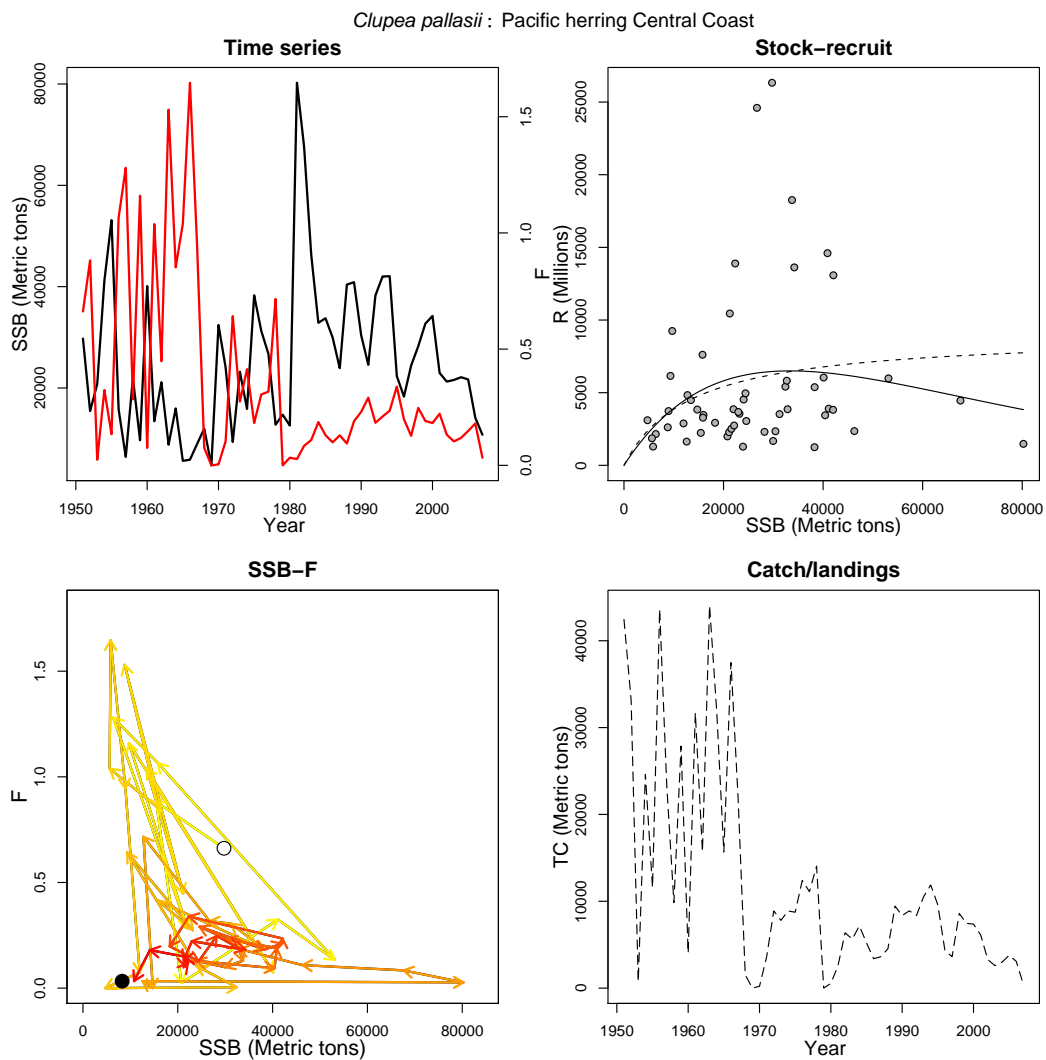
Clupea harengus - Herring



Clupea harengus - Herring

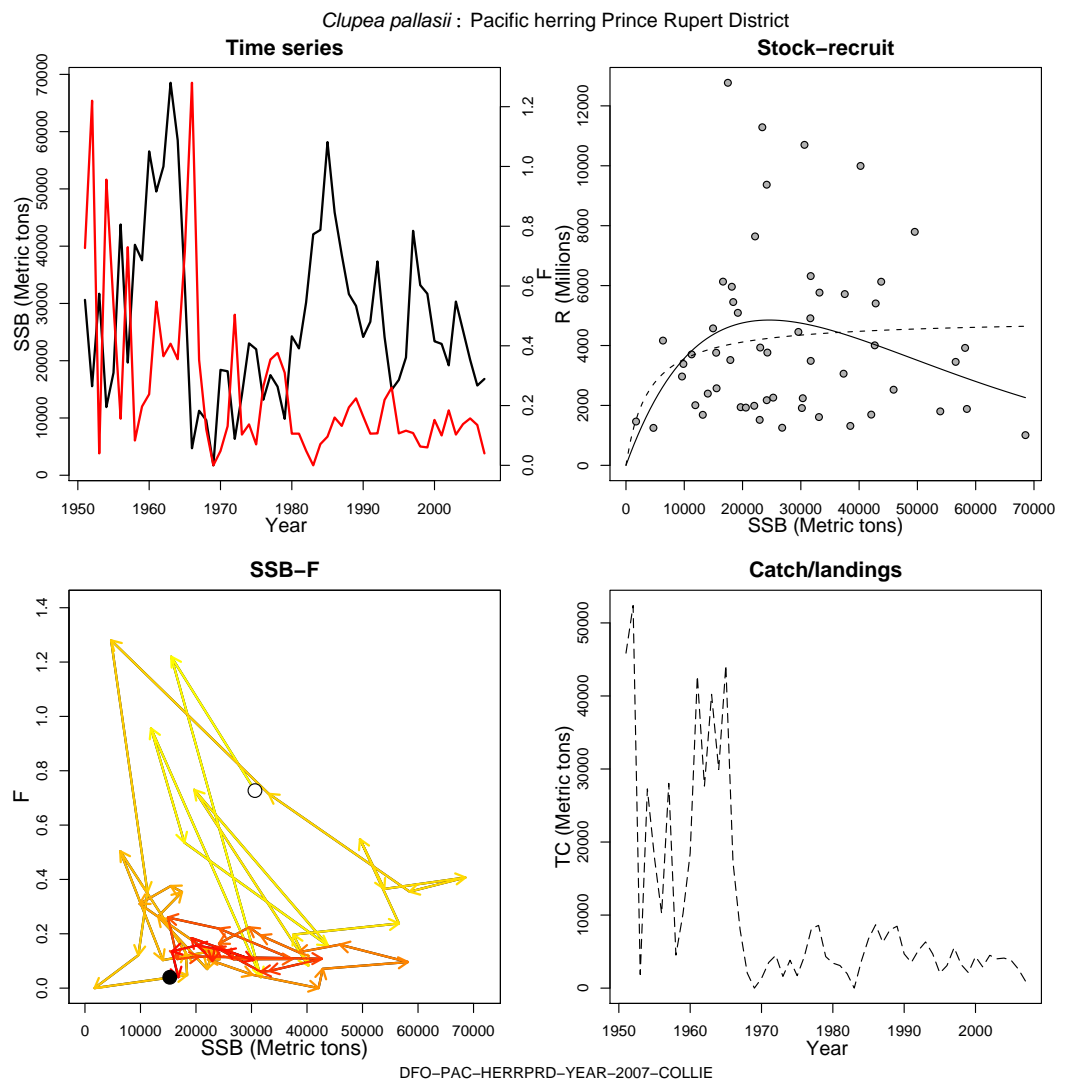


Clupea pallasii - Pacific herring

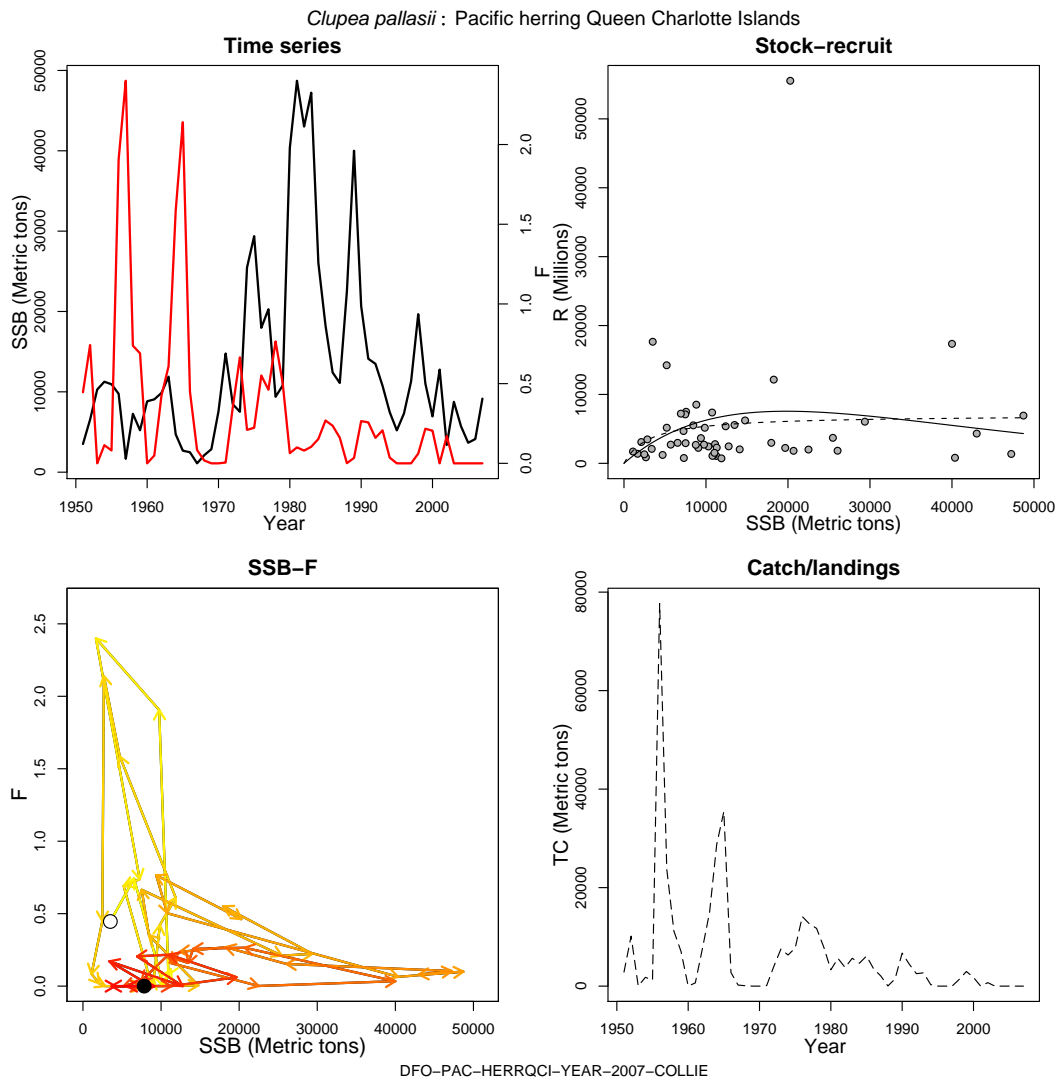


DFO-PAC-HERRCC-YEAR-2007-COLLIE

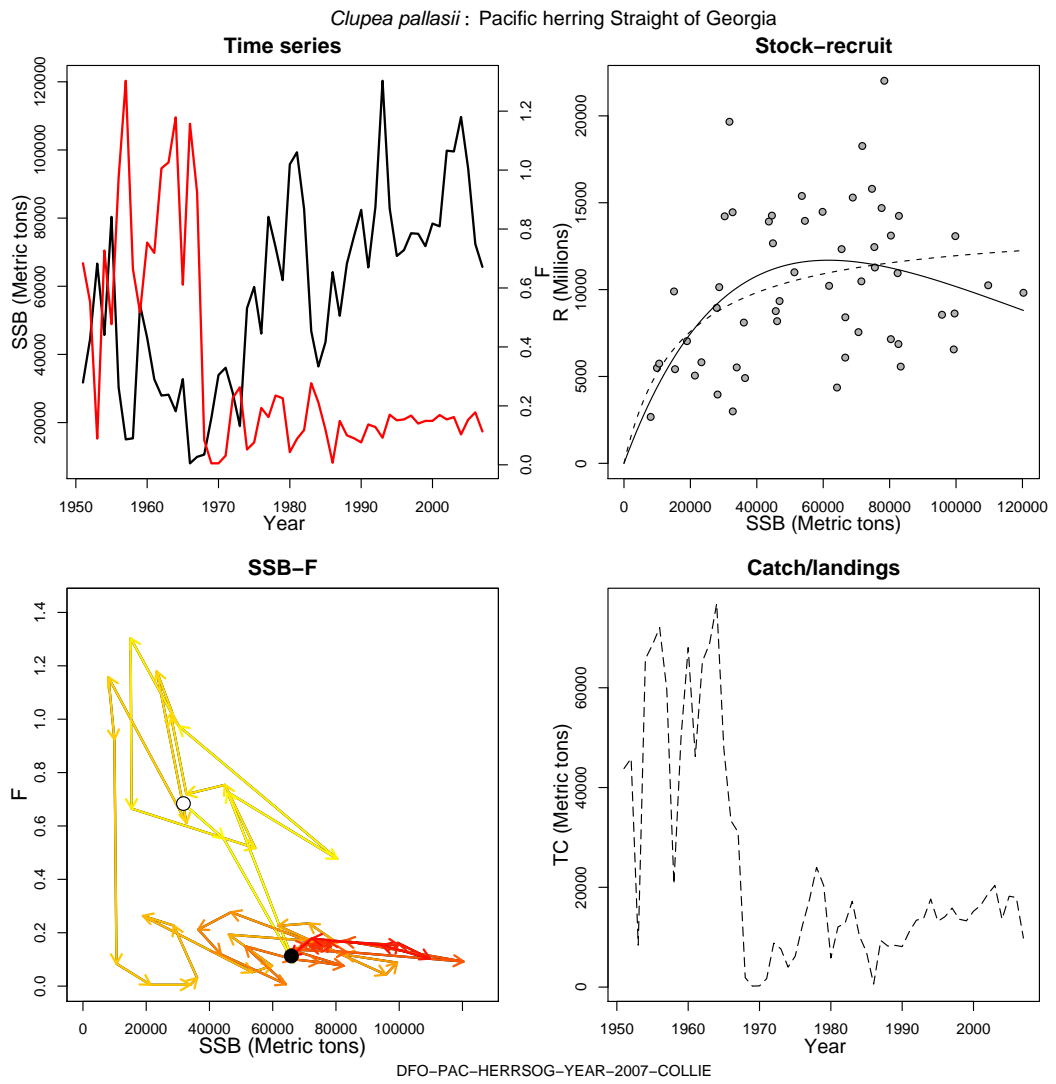
Clupea pallasii - Pacific herring



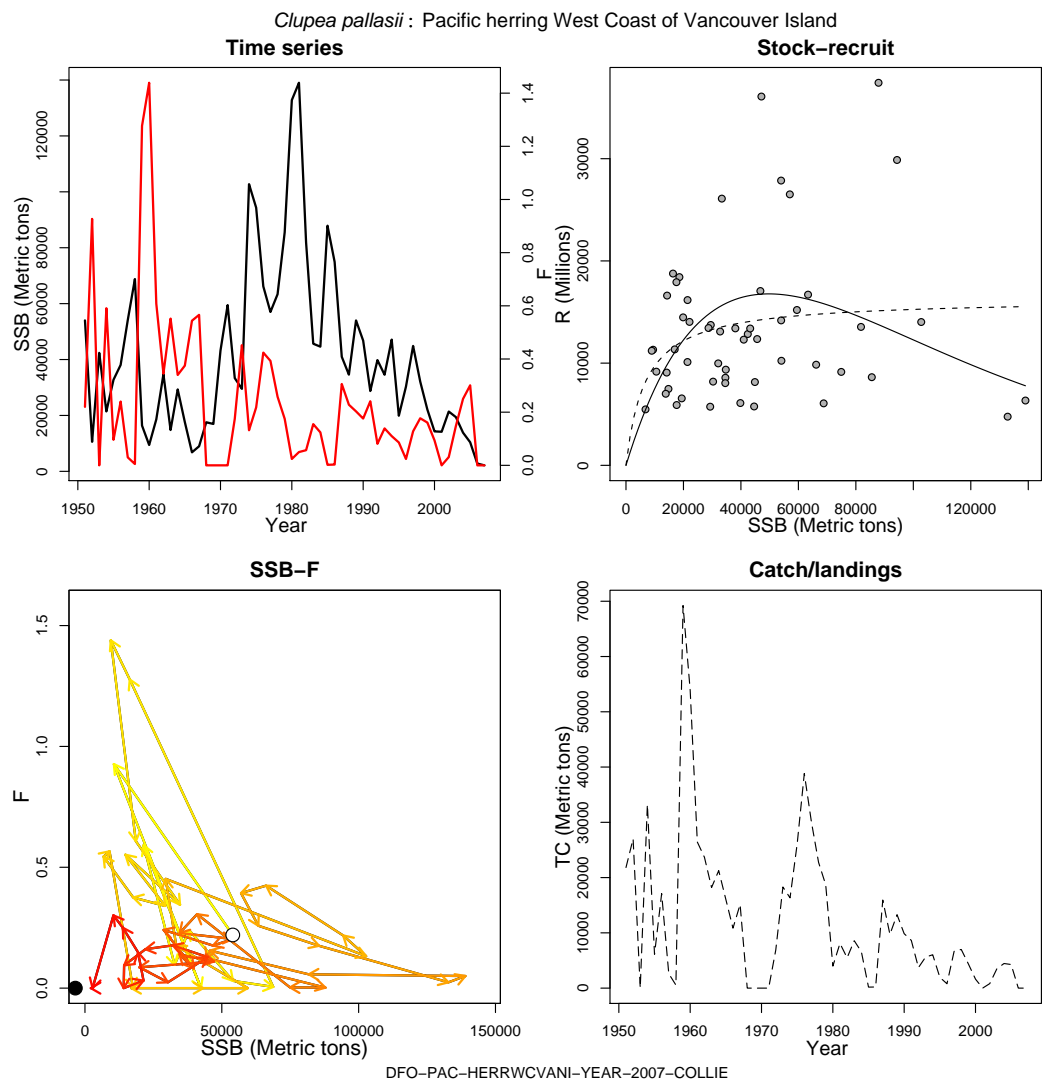
Clupea pallasii - Pacific herring



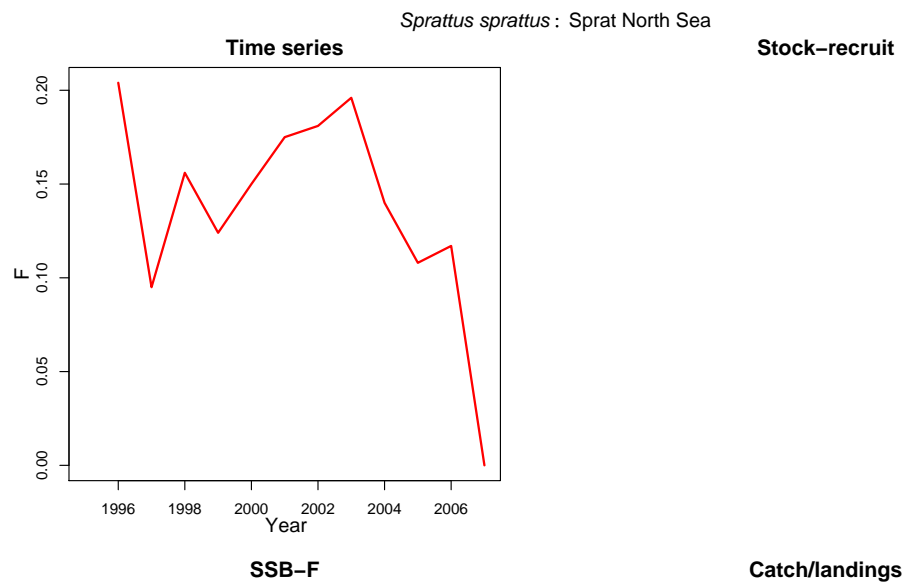
Clupea pallasii - Pacific herring



Clupea pallasii - Pacific herring



Sprattus sprattus - Sprat



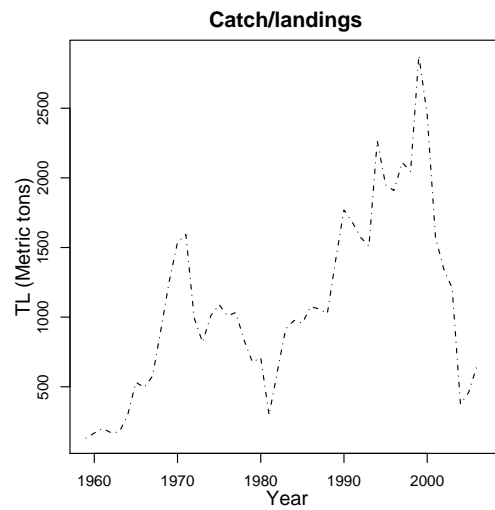
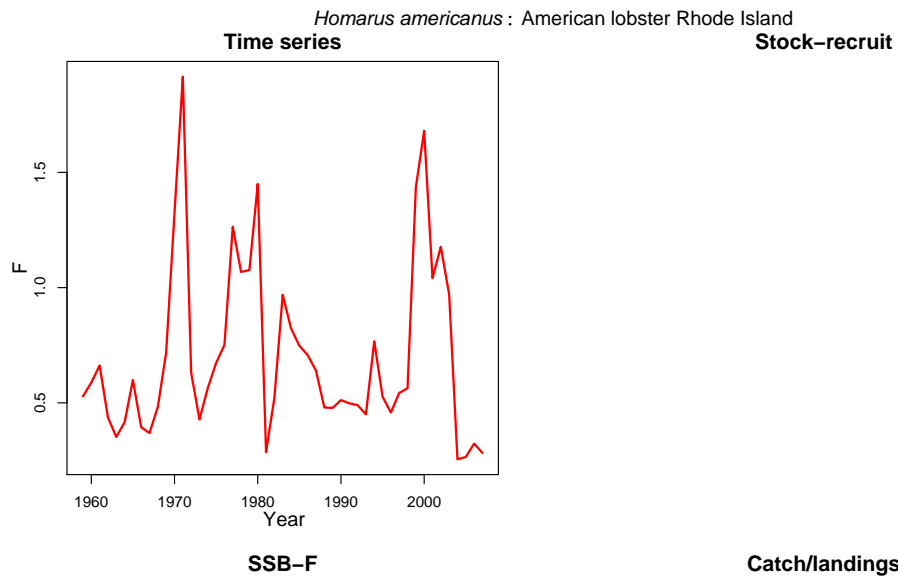
HAWG-SPRATNS-1995-2007-MINTO

3.4 Decapoda

3.4.1 Lithodidae

3.4.2 Nephropidae

Homarus americanus - American lobster



RIDEM-LOBSTERRI-YEAR-2007-COLLIE

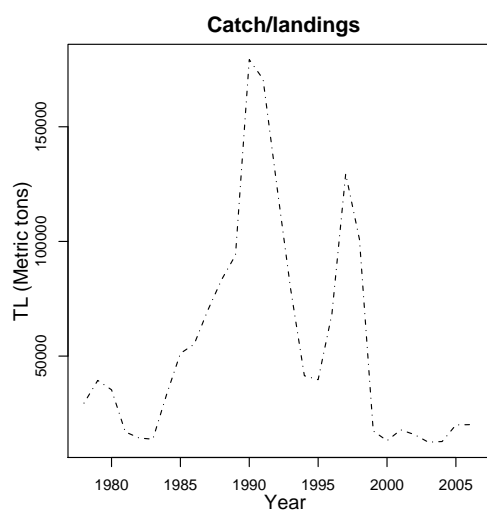
3.4.3 Oregoniidae

Chionoecetes opilio - Snow crab

Chionoecetes opilio : Snow crab Bering Sea

Time series Stock-recruit

SSB-F

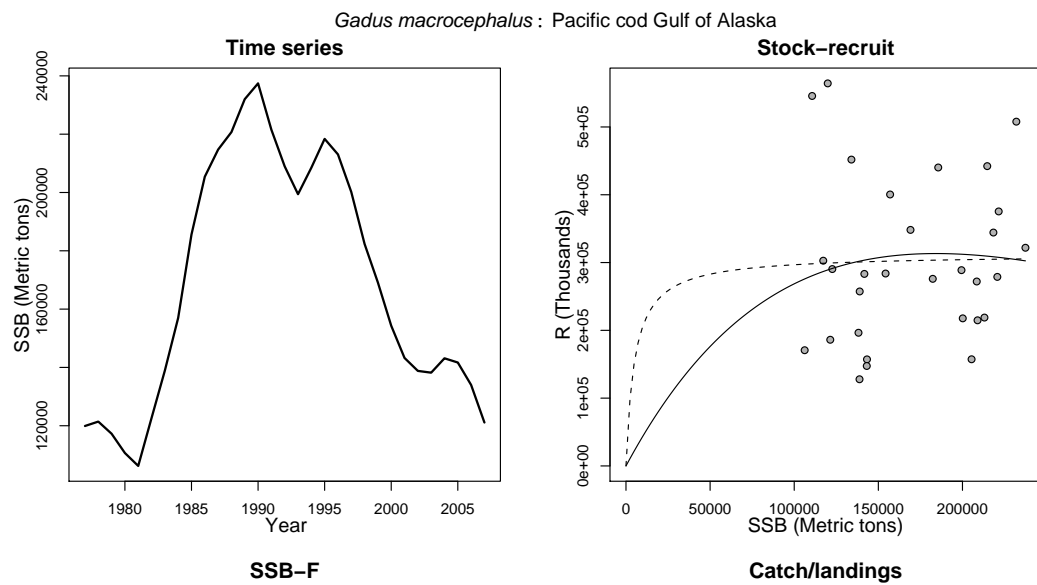


NMFS-SNOWCRABBS-2007-FOGARTY

3.5 Gadiformes

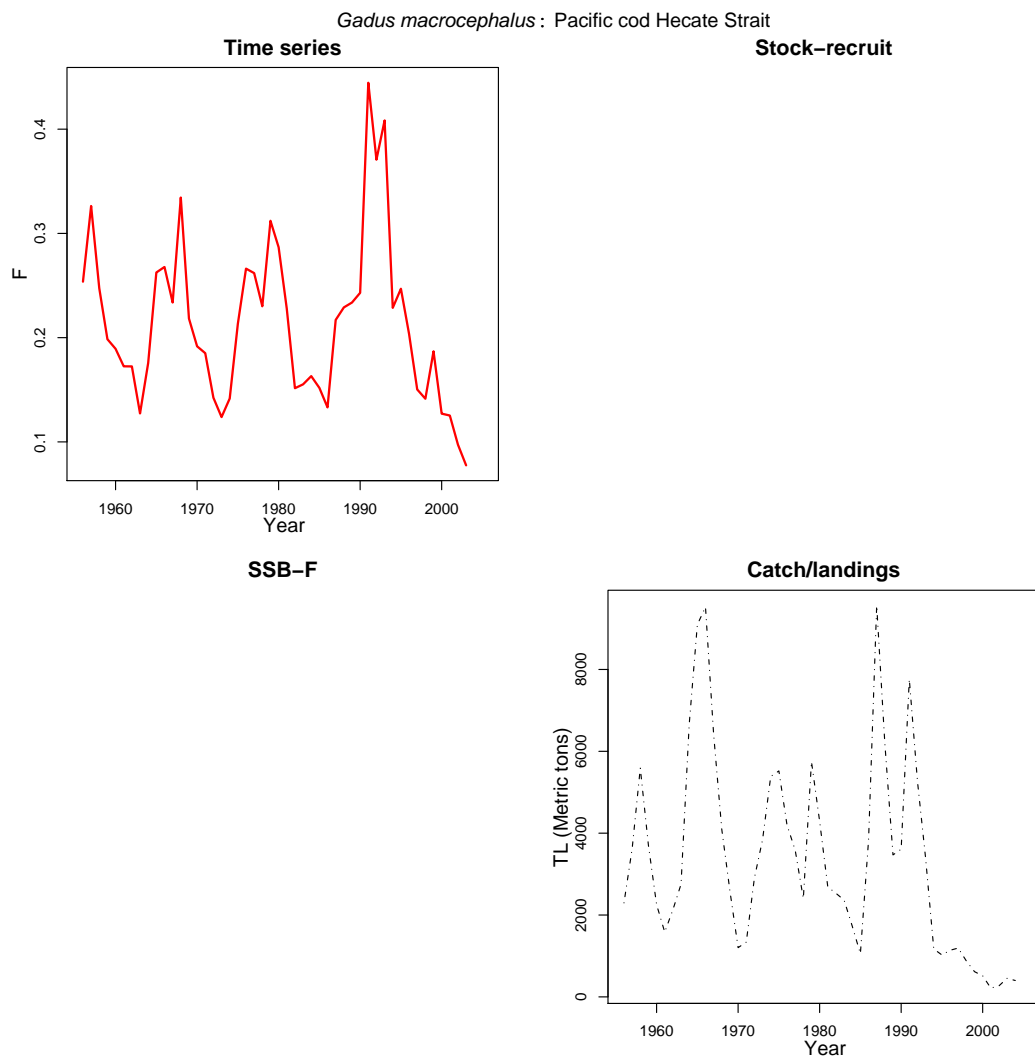
3.5.1 Gadidae

Gadus macrocephalus - Pacific cod



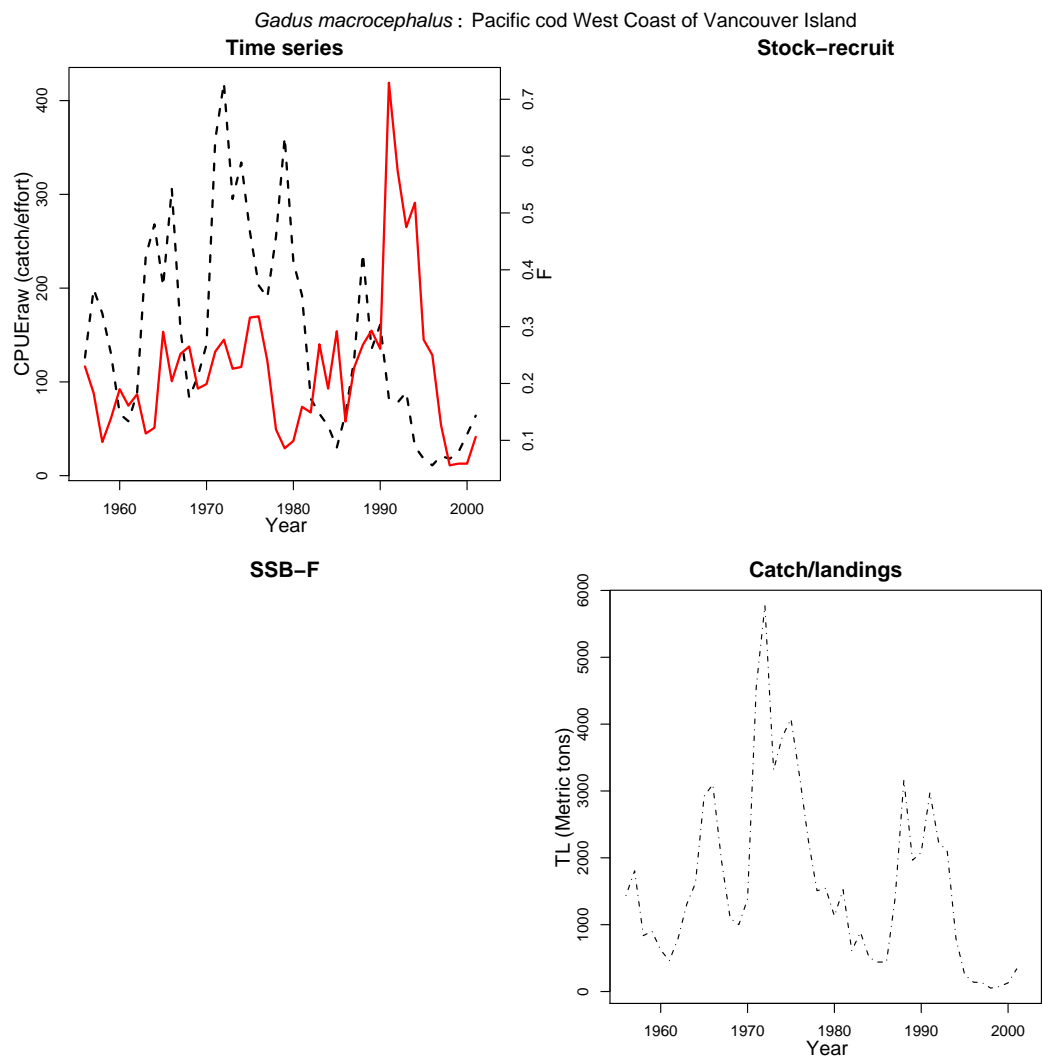
AFSC-PCODGA-1977-2007-BAUM

Gadus macrocephalus - Pacific cod



DFO-PAC-PCODHS-YEAR-2005-COLLIE

Gadus macrocephalus - Pacific cod



DFO-PAC-PCODWCVANI-YEAR-2002-COLLIE

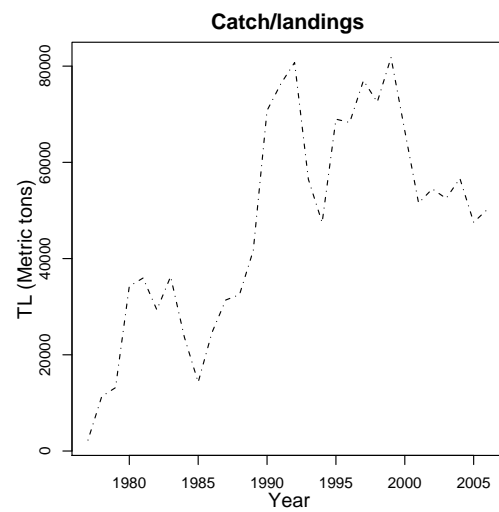
Gadus macrocephalus - Pacific cod

Gadus macrocephalus : Pacific cod Gulf of Alaska

Time series

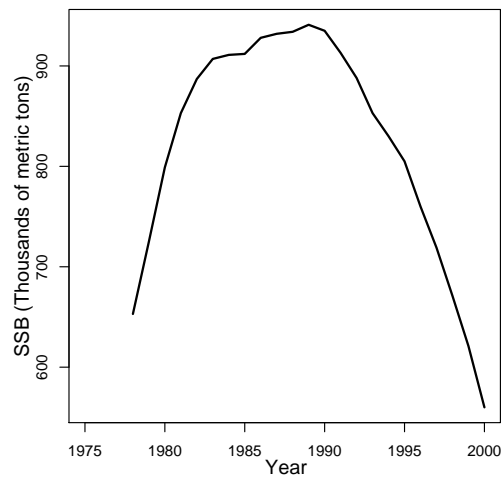
Stock-recruit

SSB-F

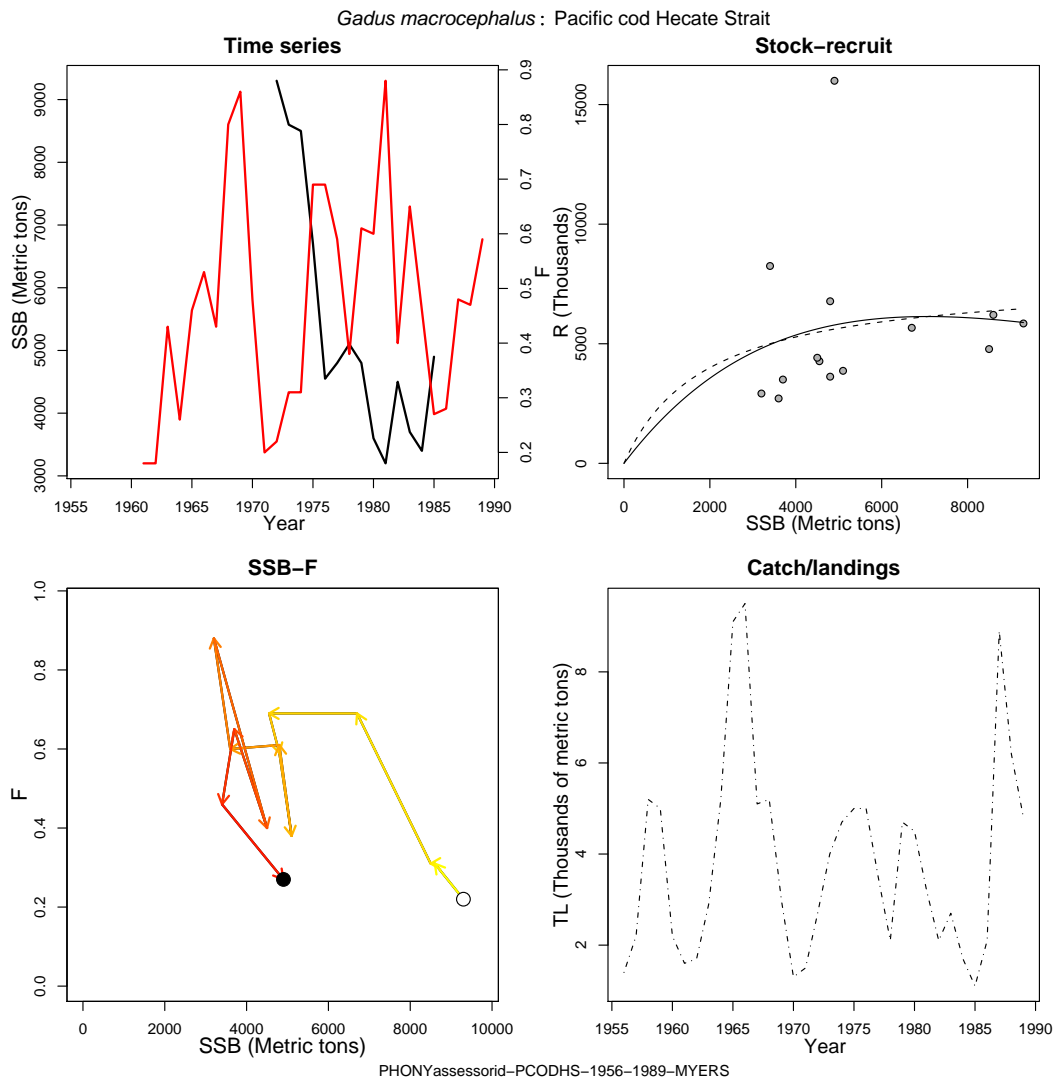


NMFS-PCODGA-2006-FOGARTY

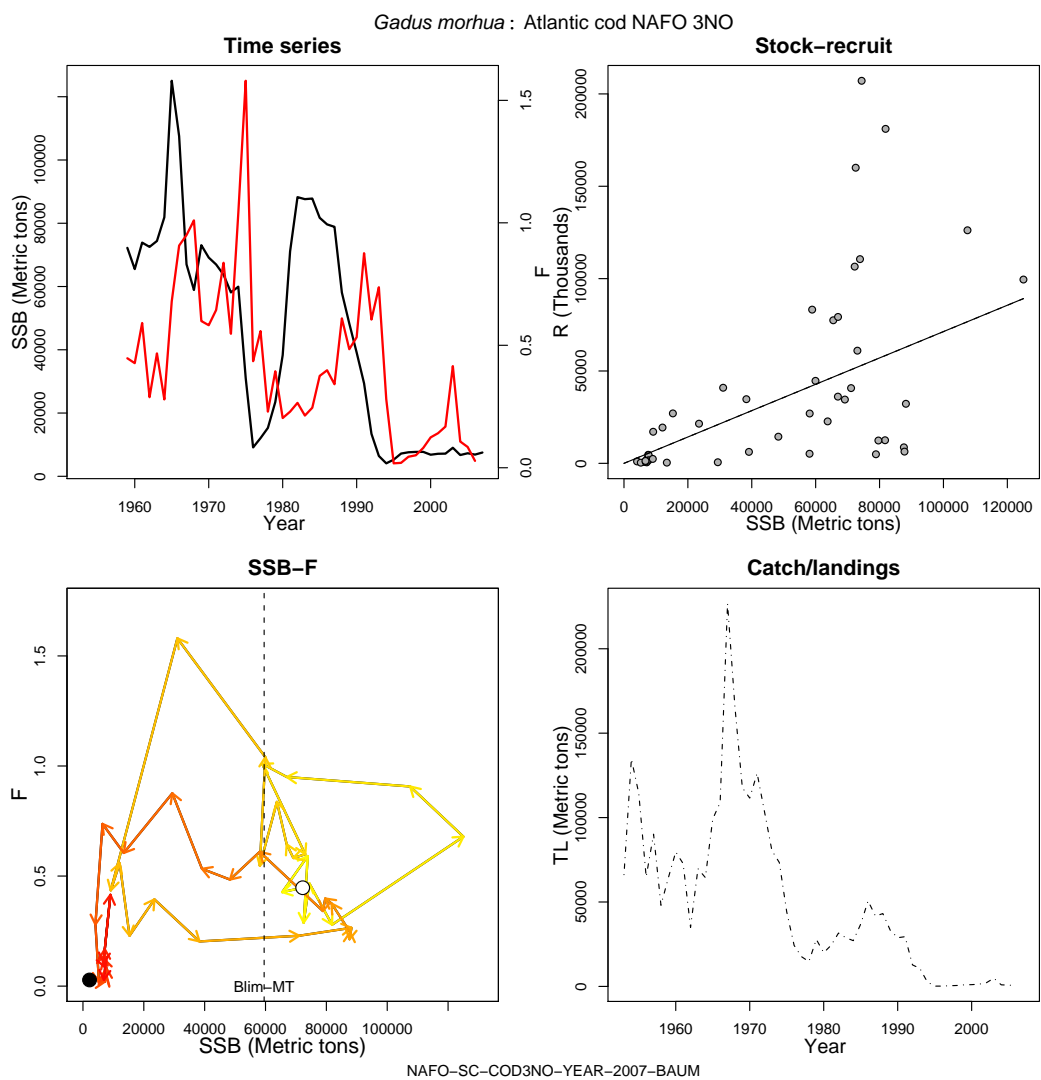
Gadus macrocephalus - Pacific cod



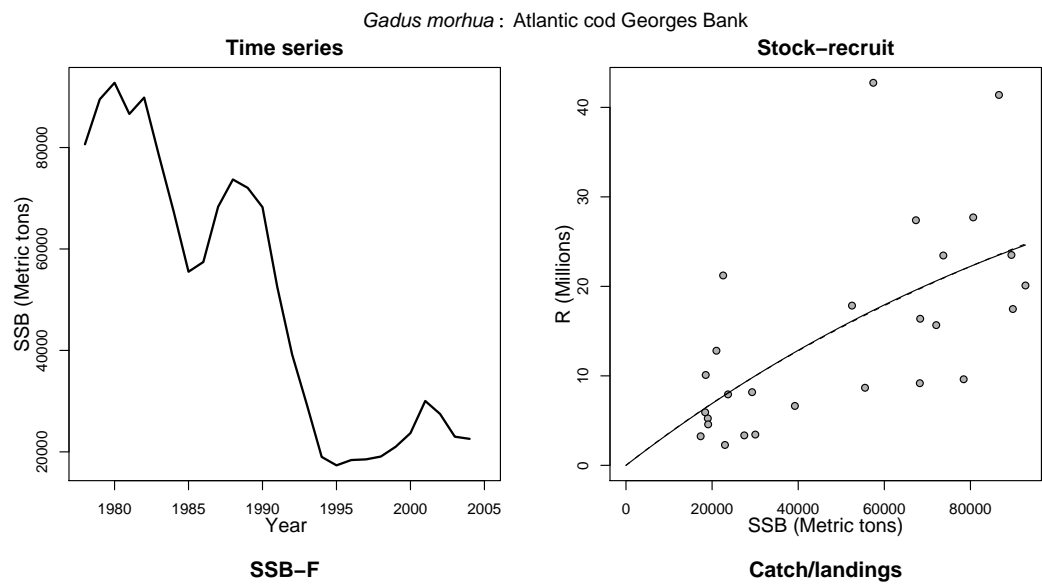
Gadus macrocephalus - Pacific cod



Gadus morhua - Atlantic cod

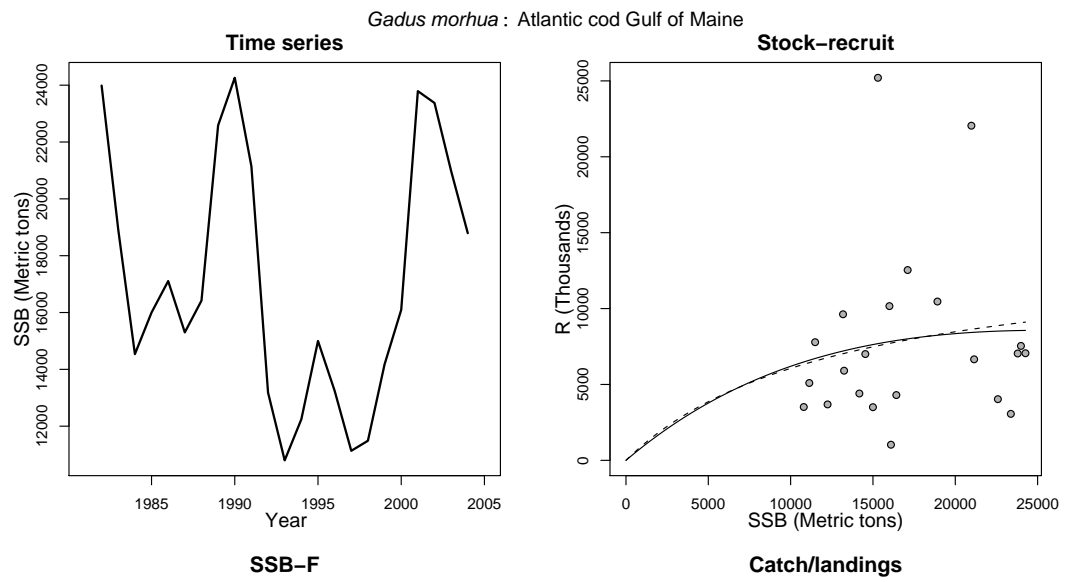


Gadus morhua - Atlantic cod



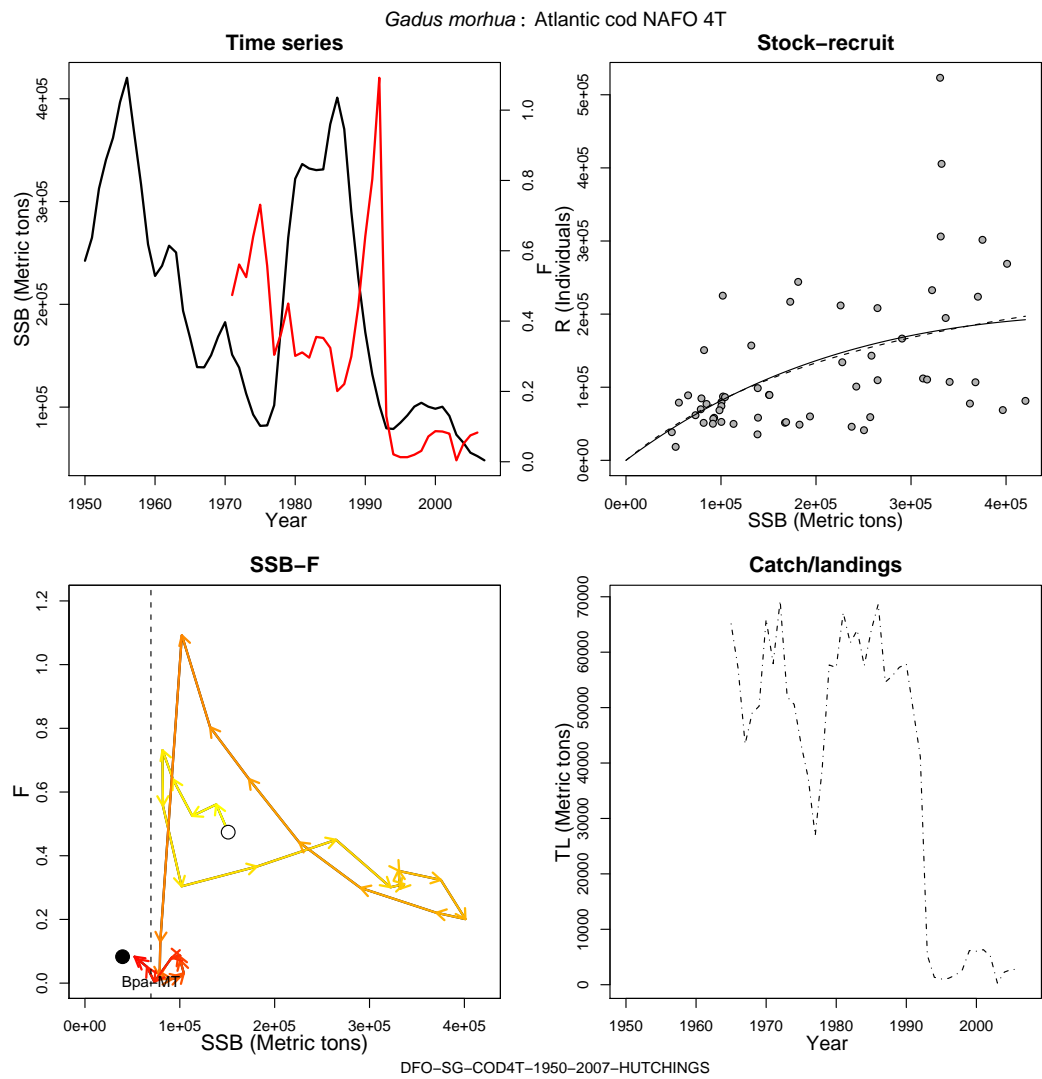
NMFS-CODGB-2005-FOGARTY

Gadus morhua - Atlantic cod

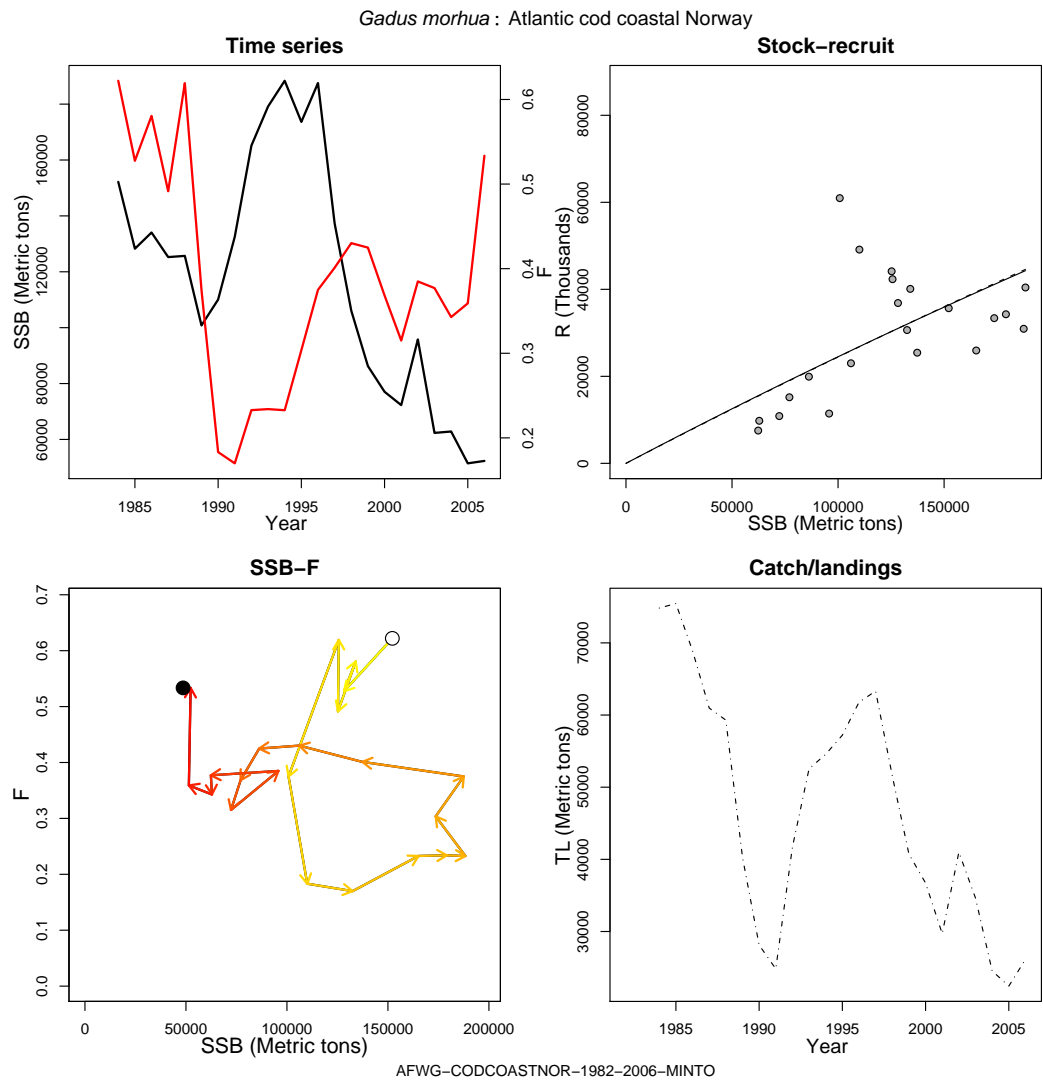


NMFS-CODGOM-2005-FOGARTY

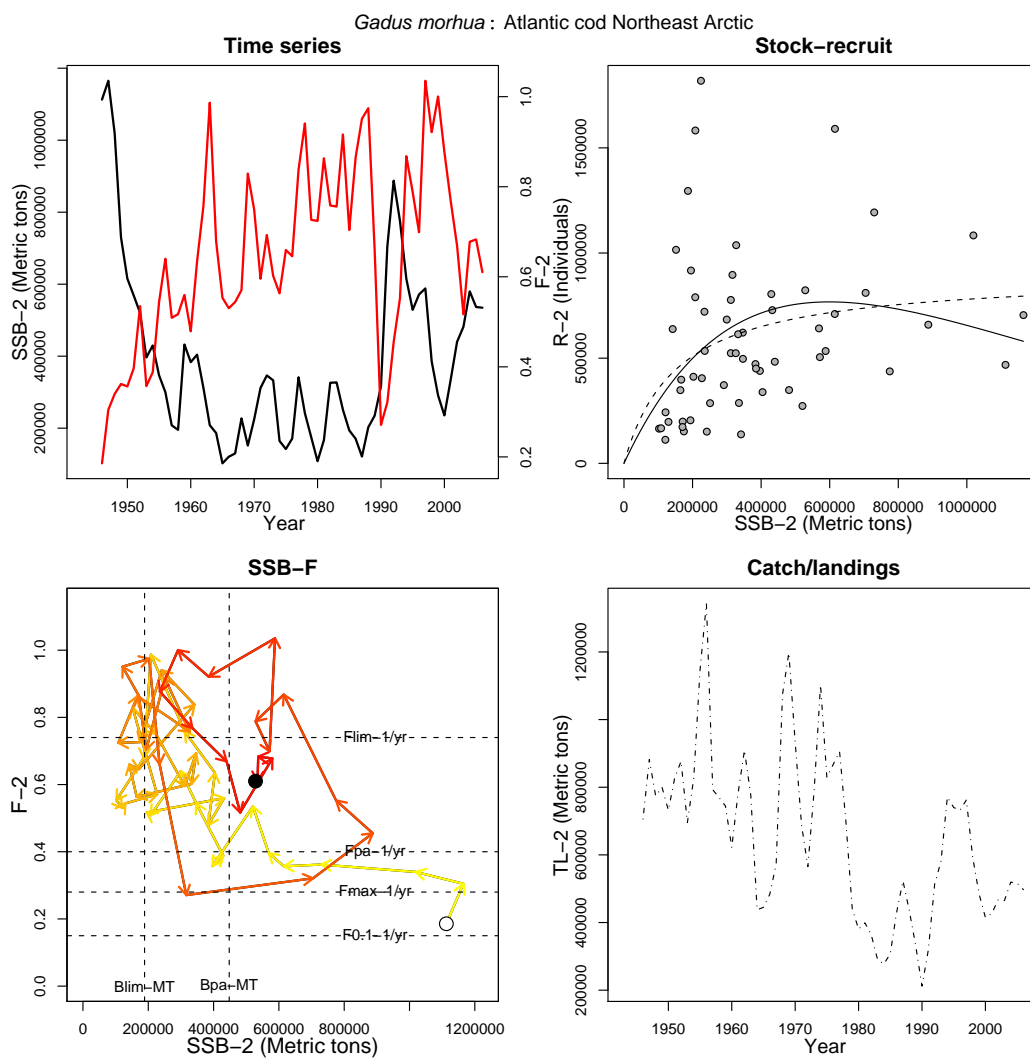
Gadus morhua - Atlantic cod



Gadus morhua - Atlantic cod

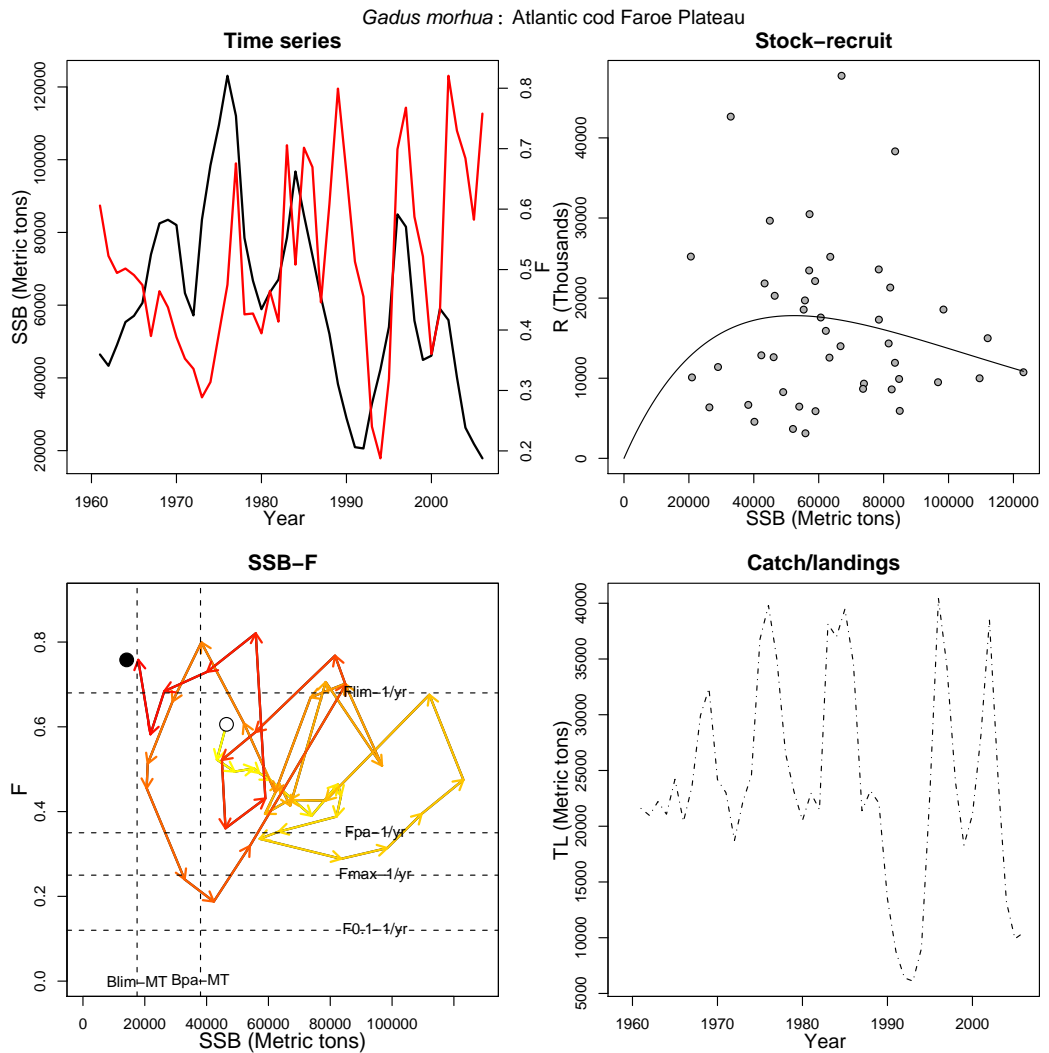


Gadus morhua - Atlantic cod



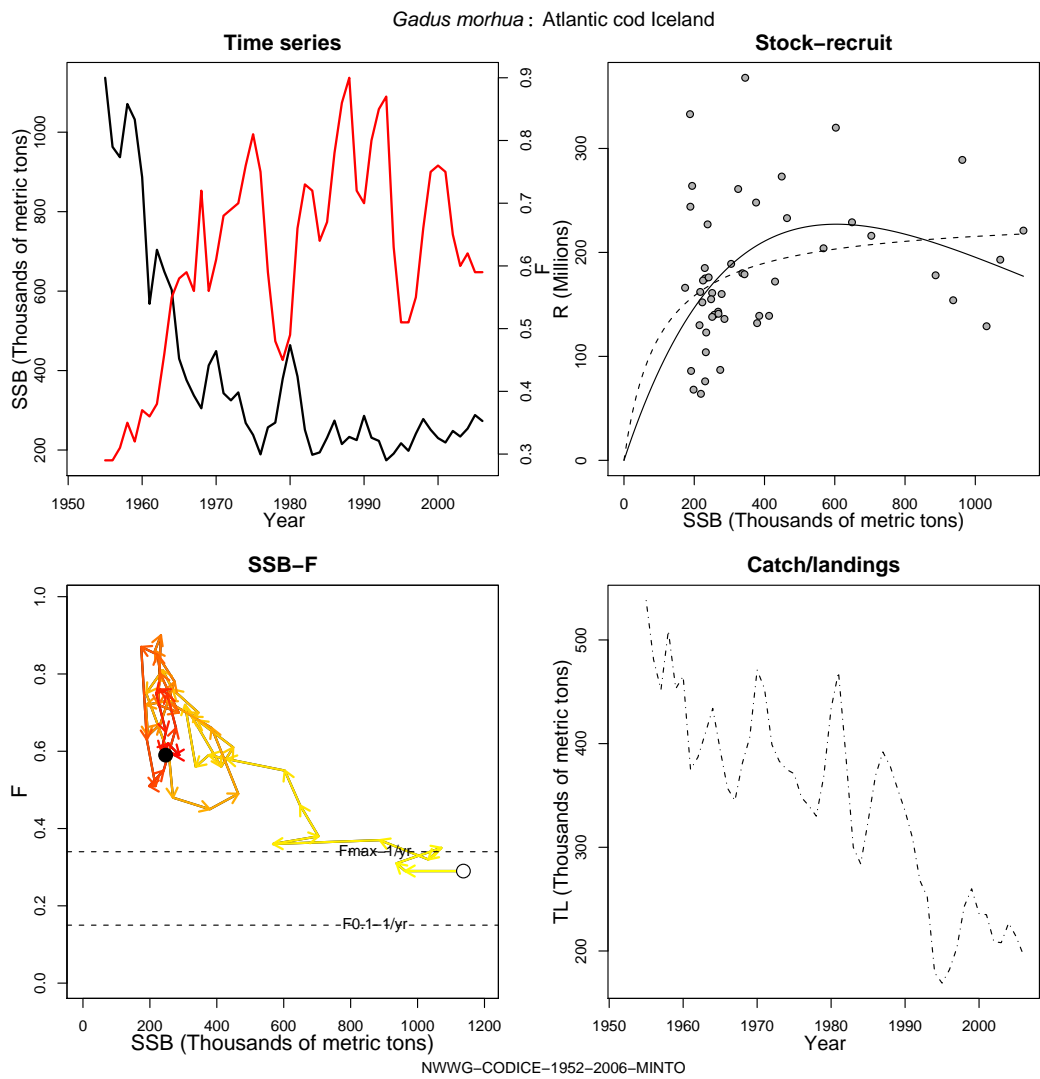
AFWG-CODNEAR-1943-2006-MINTO

Gadus morhua - Atlantic cod

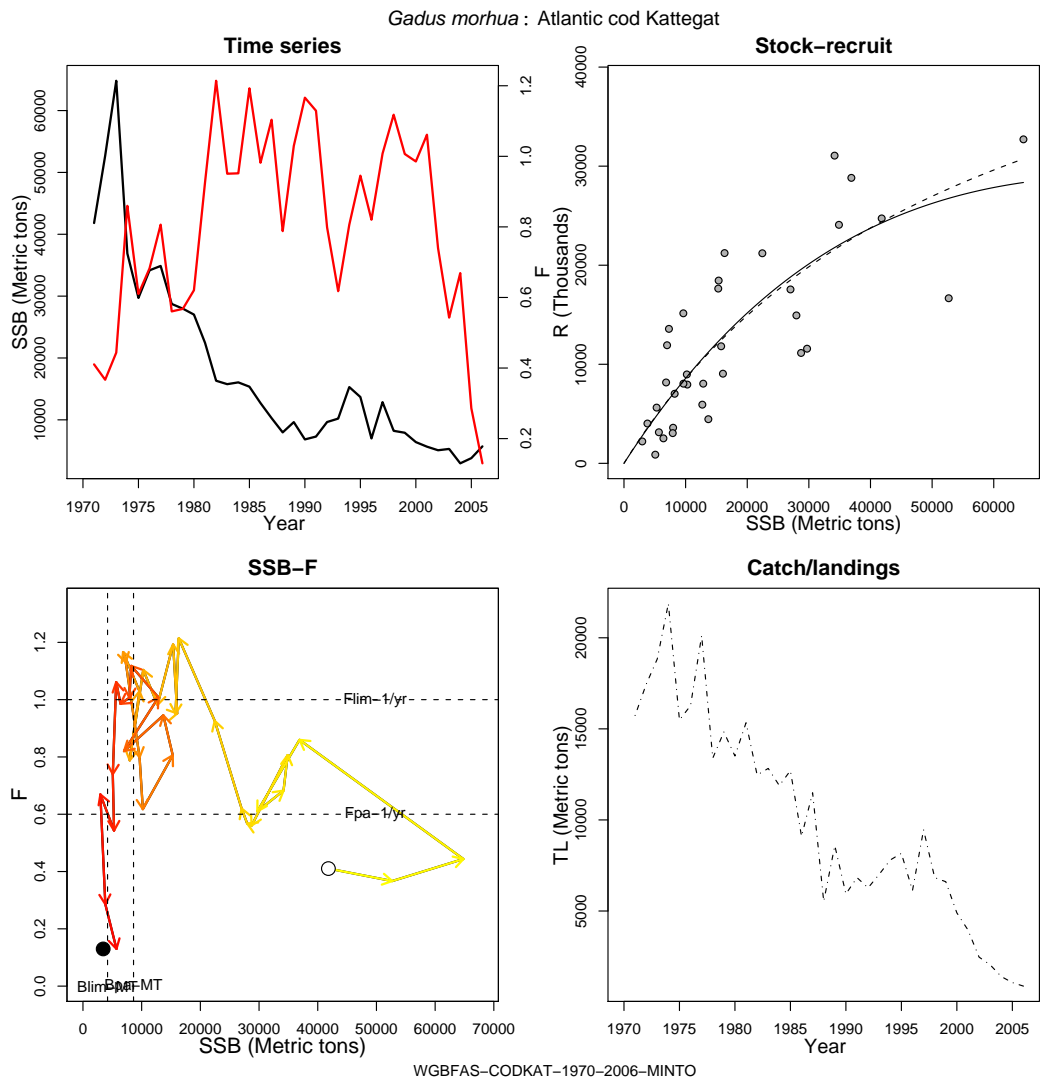


NWWG-CODFAPL-1959-2006-MINTO

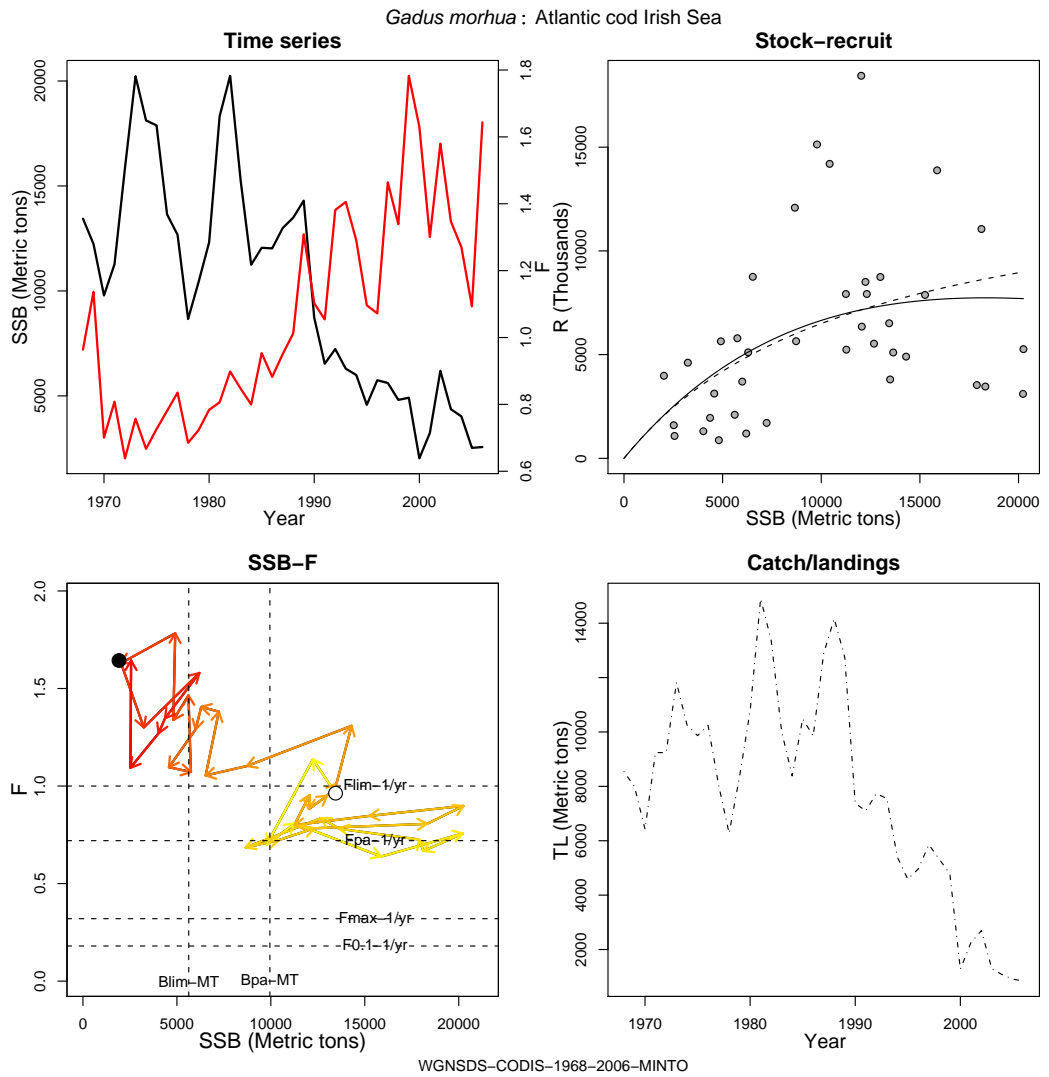
Gadus morhua - Atlantic cod



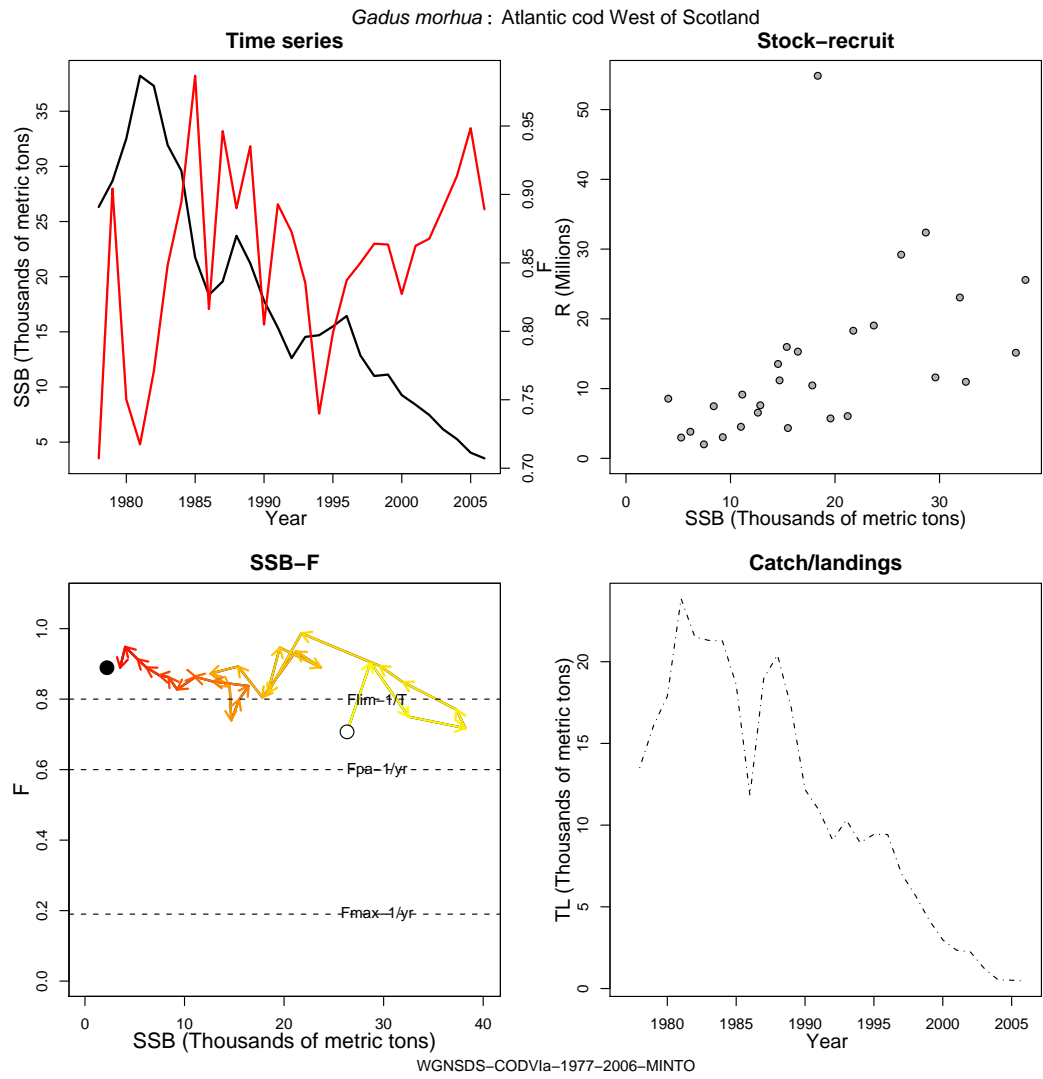
Gadus morhua - Atlantic cod



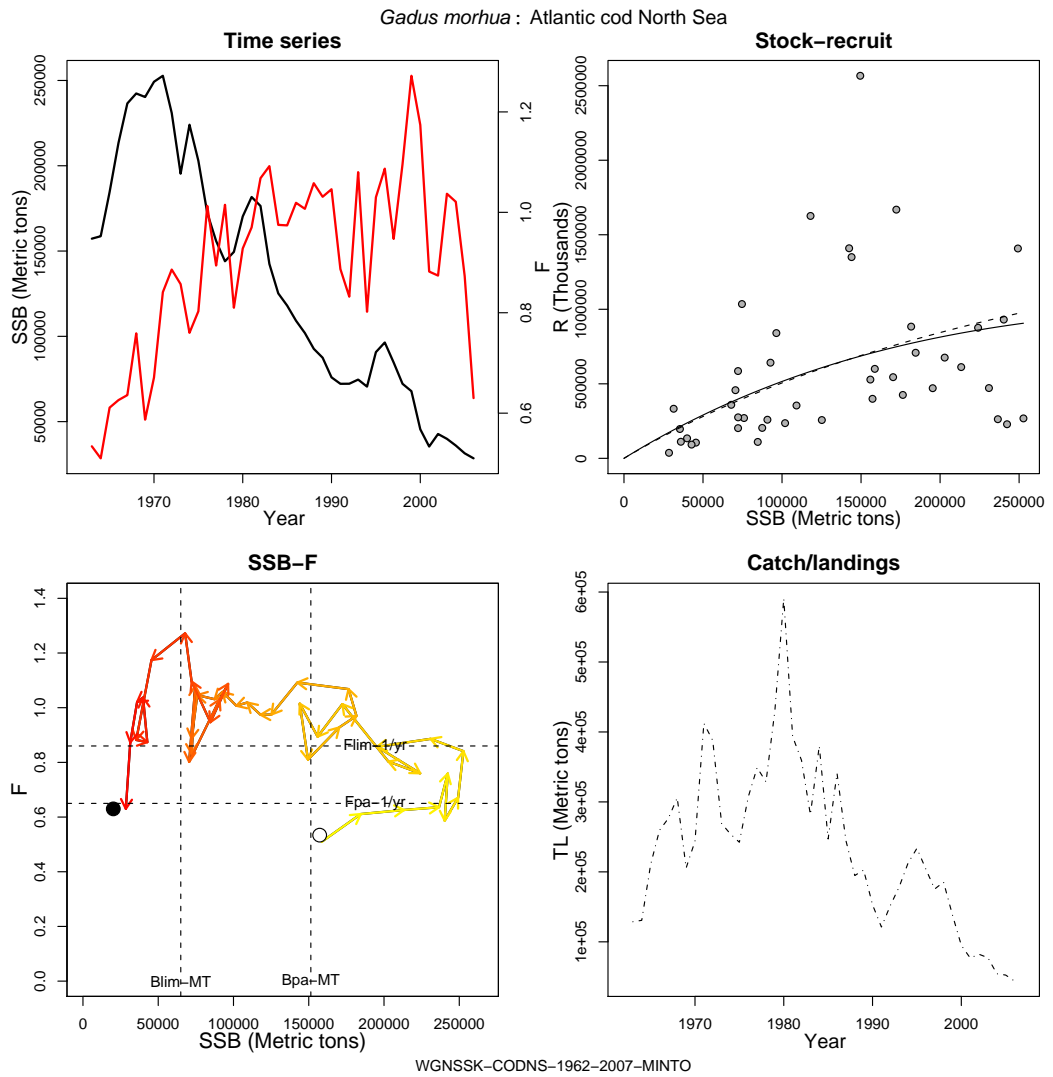
Gadus morhua - Atlantic cod



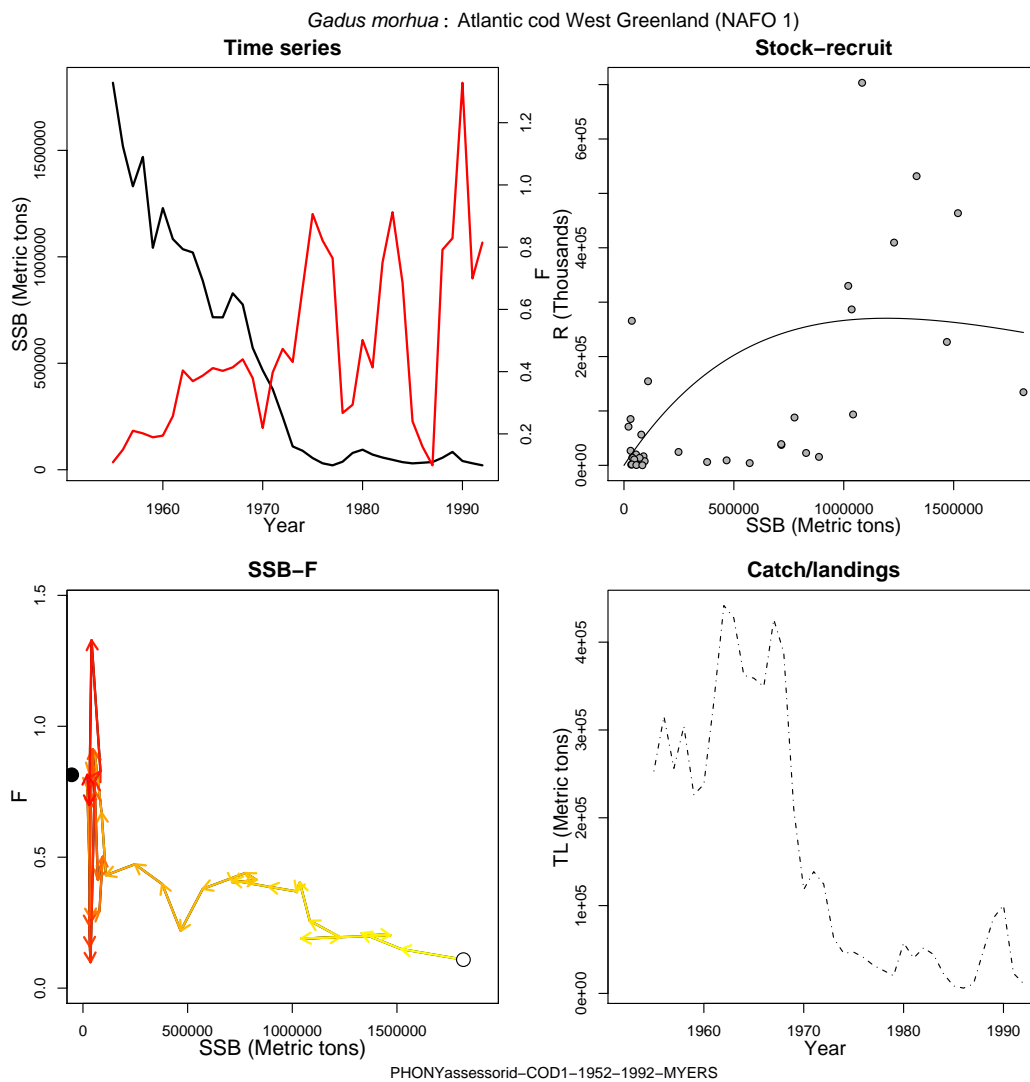
Gadus morhua - Atlantic cod



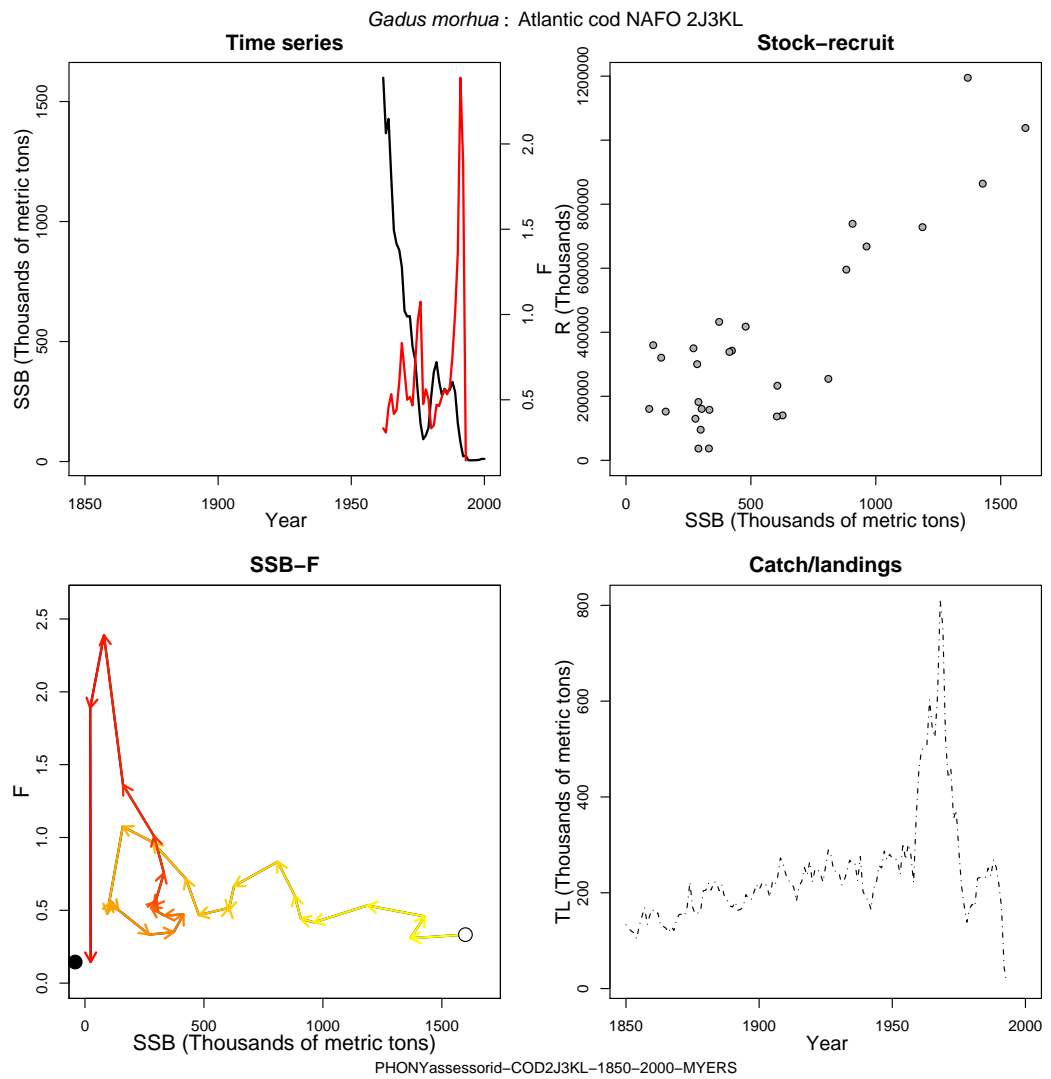
Gadus morhua - Atlantic cod



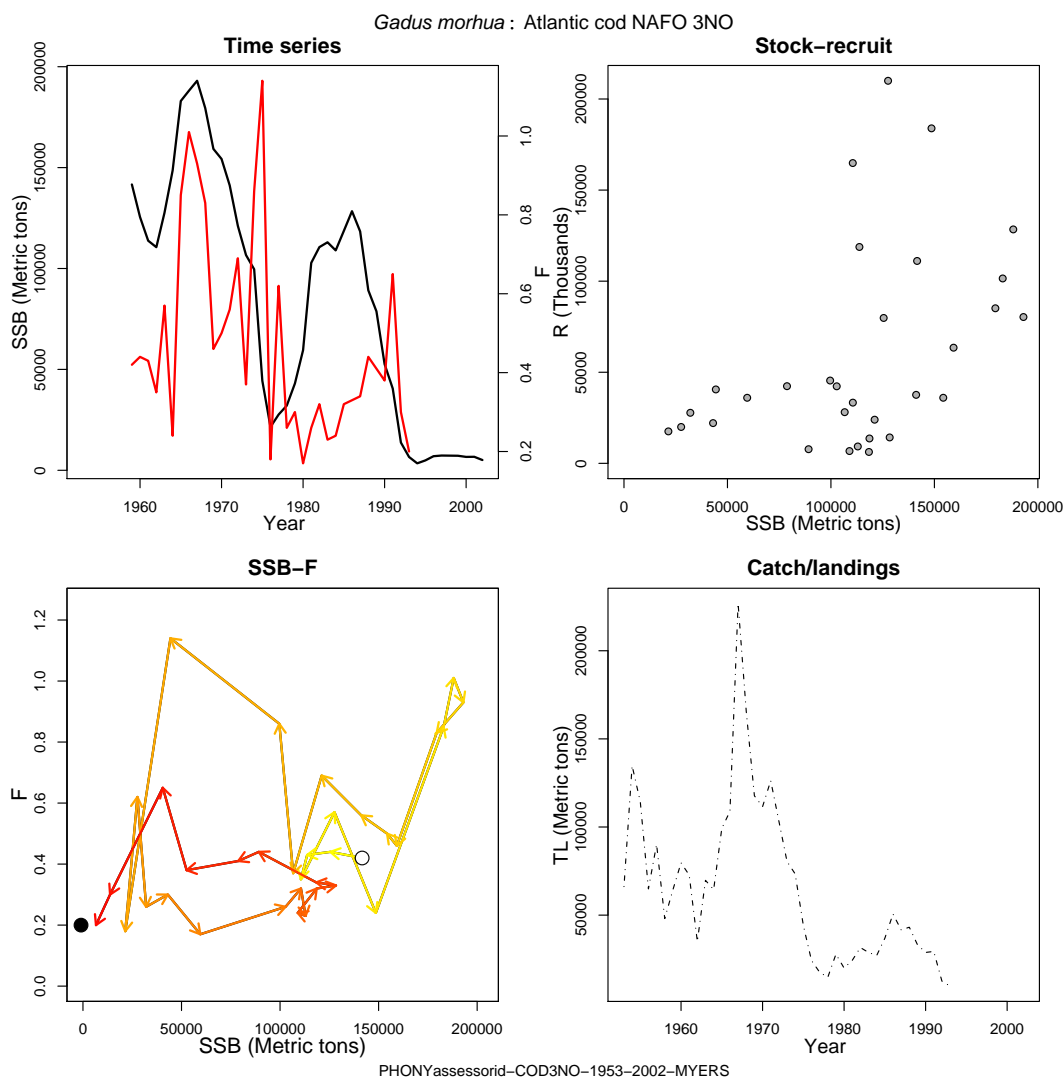
Gadus morhua - Atlantic cod



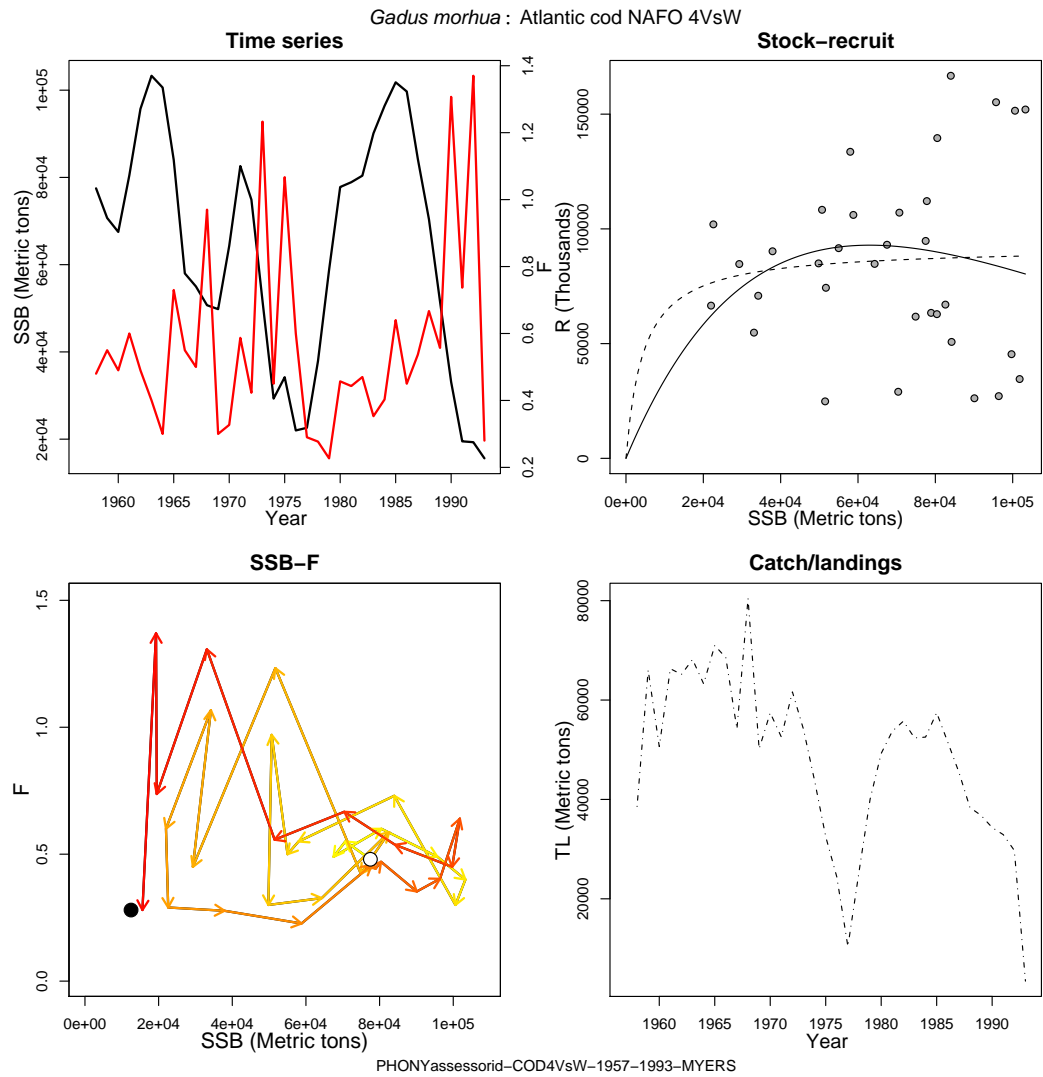
Gadus morhua - Atlantic cod



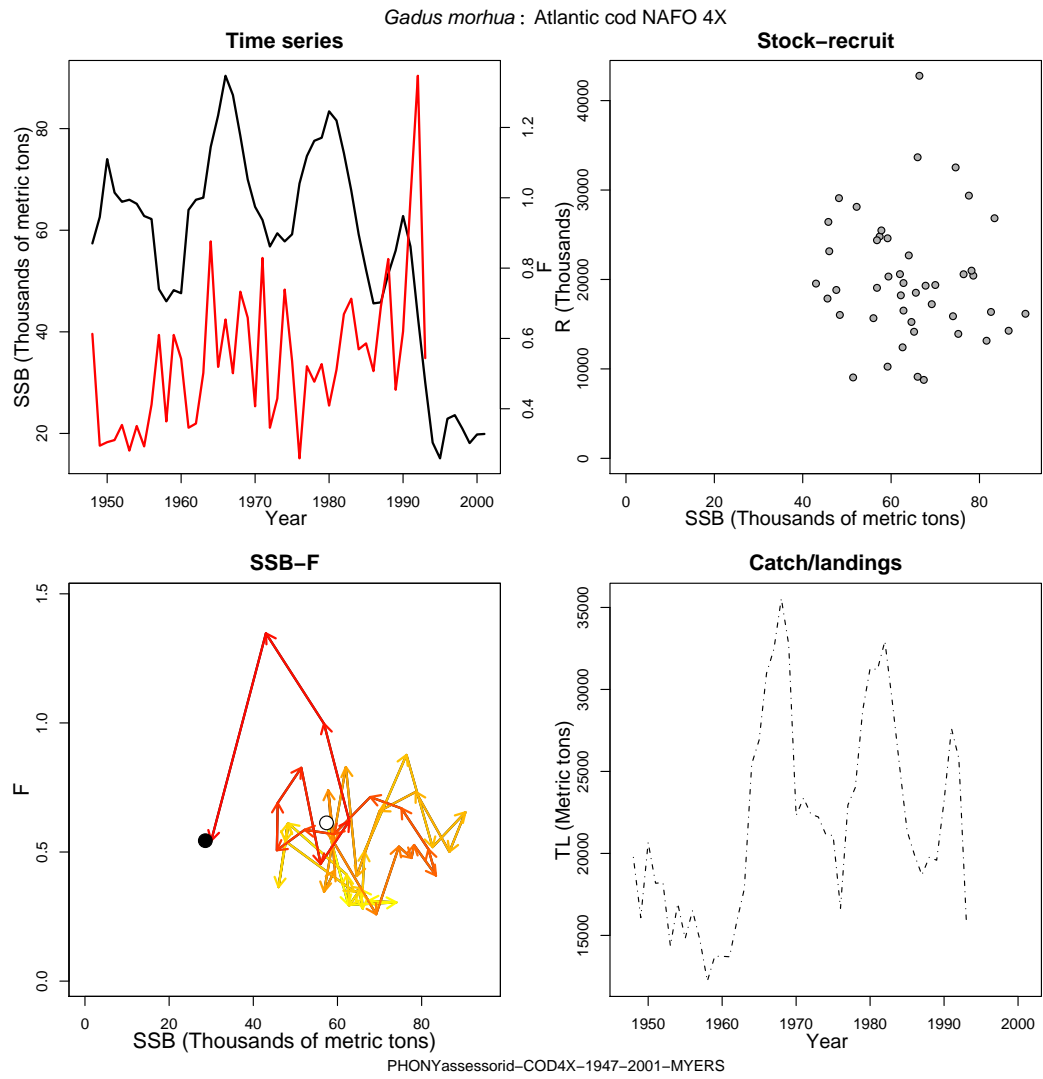
Gadus morhua - Atlantic cod



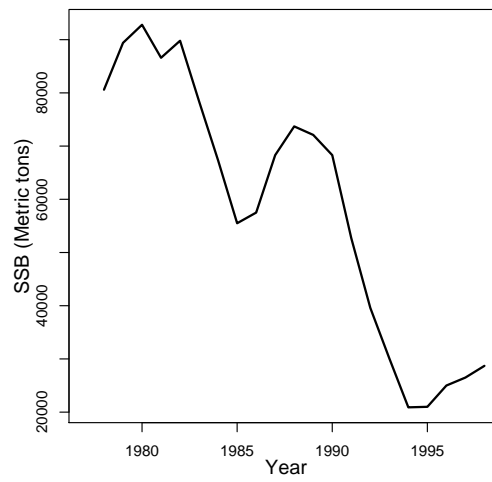
Gadus morhua - Atlantic cod



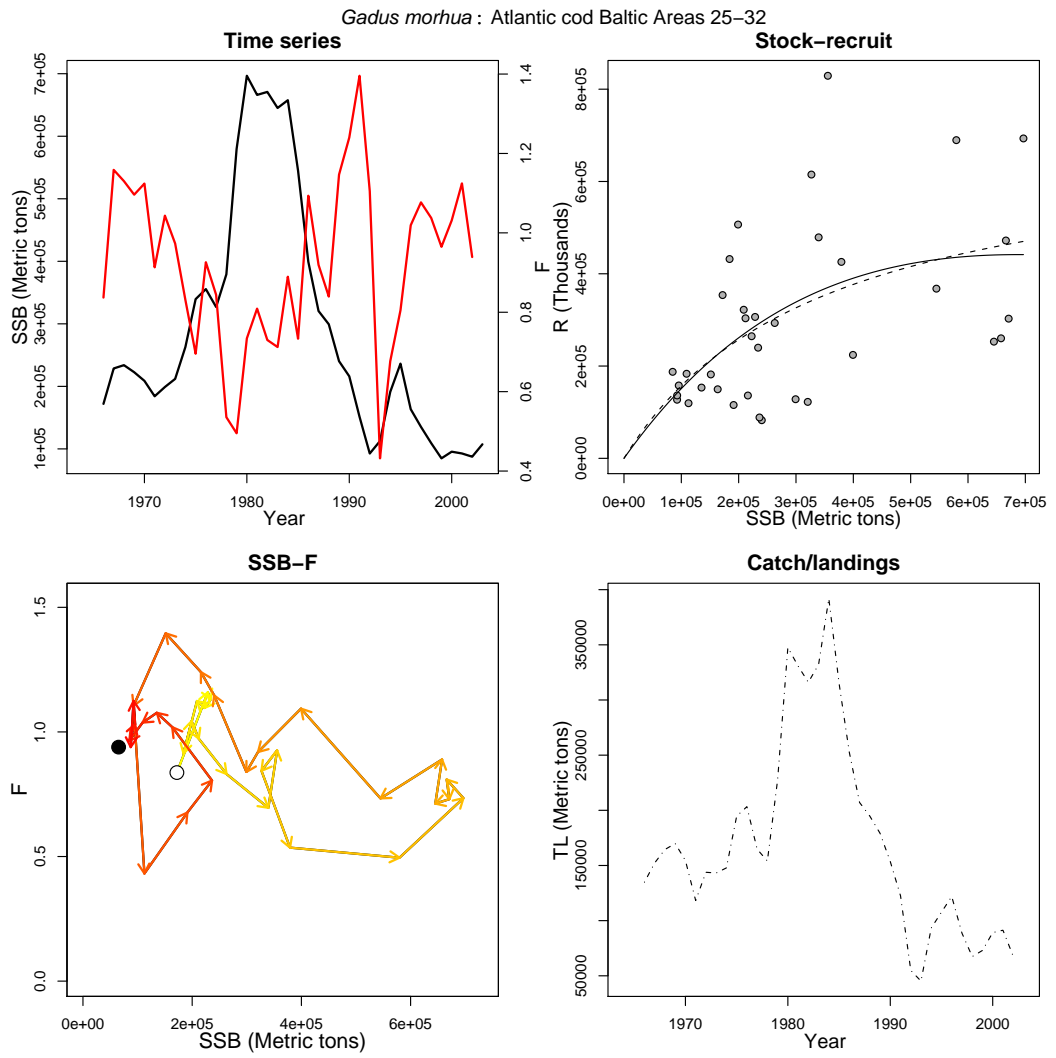
Gadus morhua - Atlantic cod



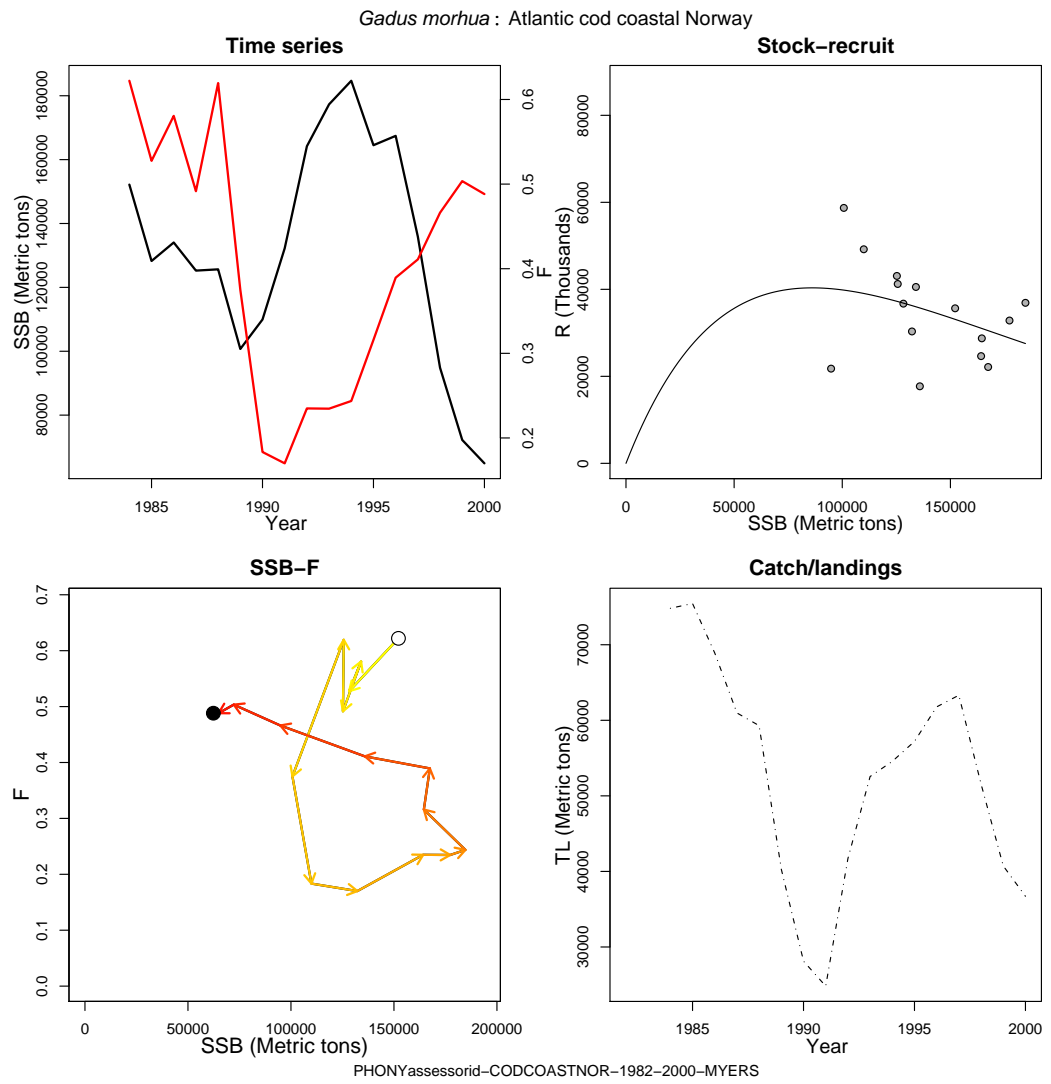
Gadus morhua - Atlantic cod



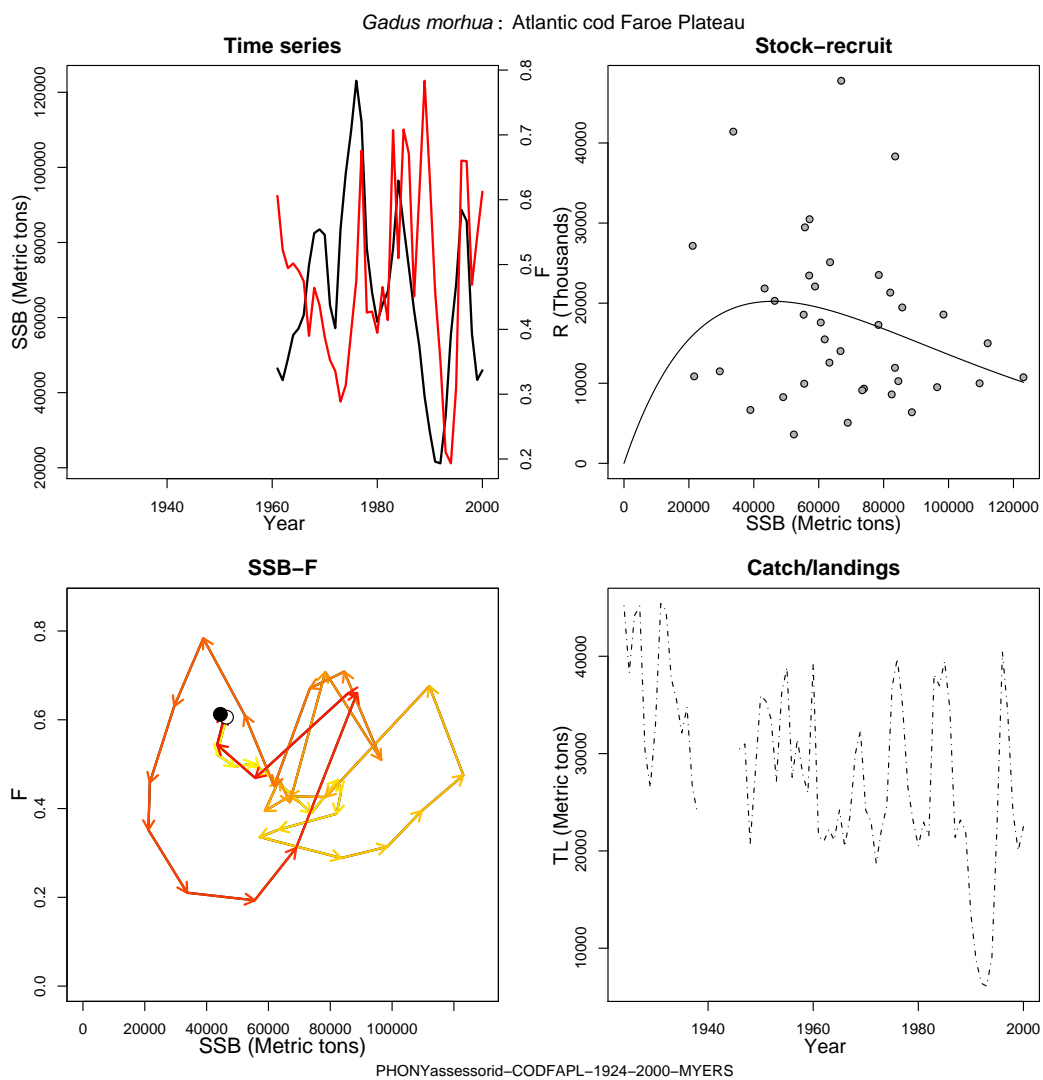
Gadus morhua - Atlantic cod



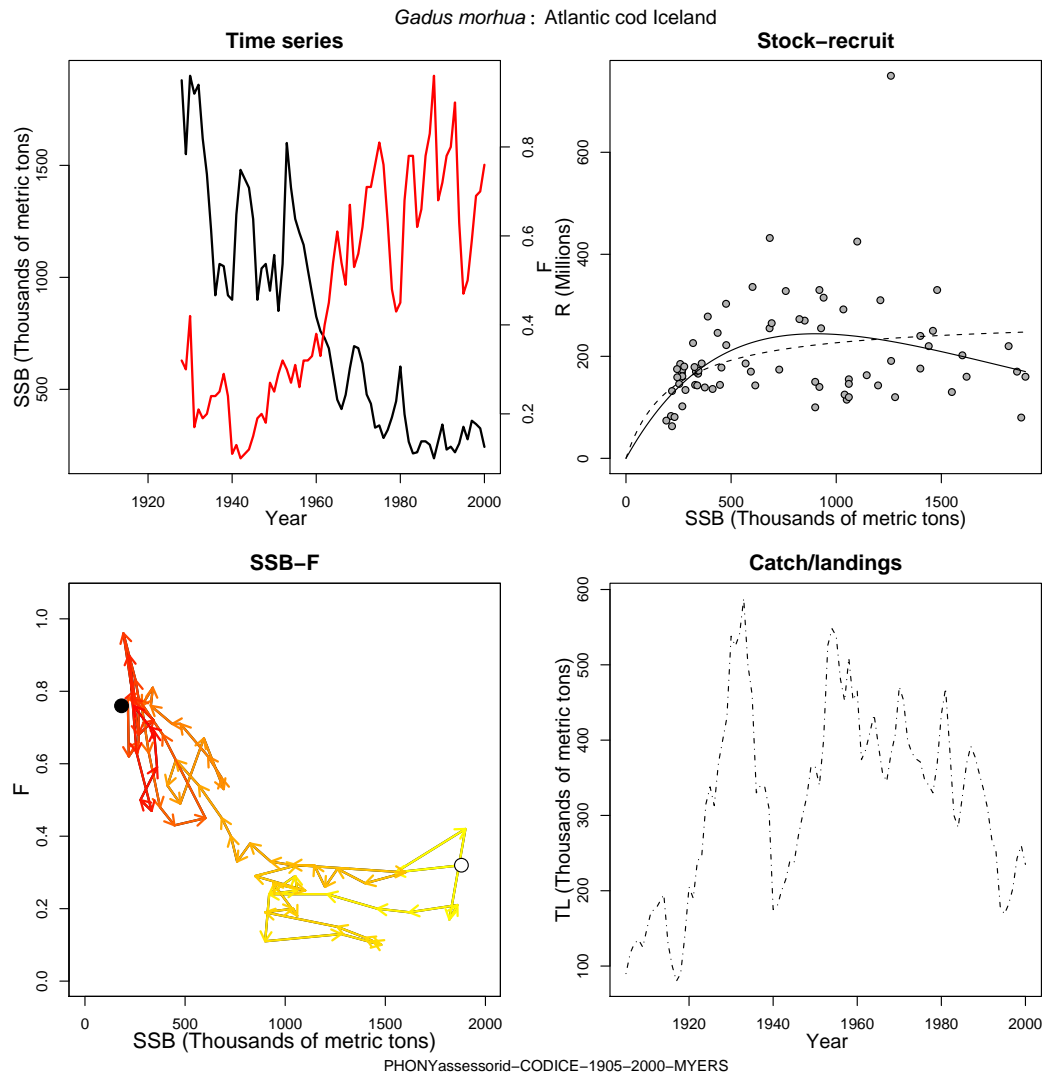
Gadus morhua - Atlantic cod



Gadus morhua - Atlantic cod

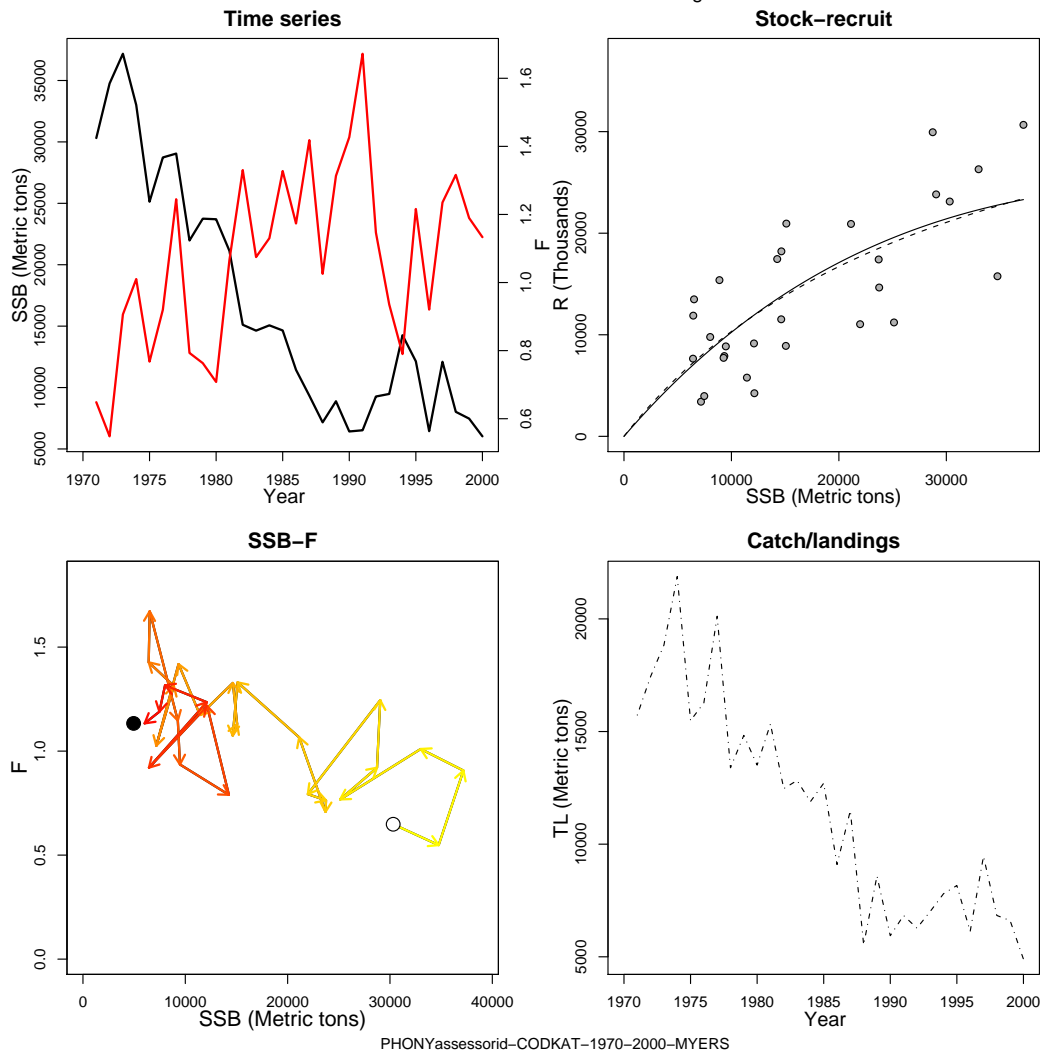


Gadus morhua - Atlantic cod

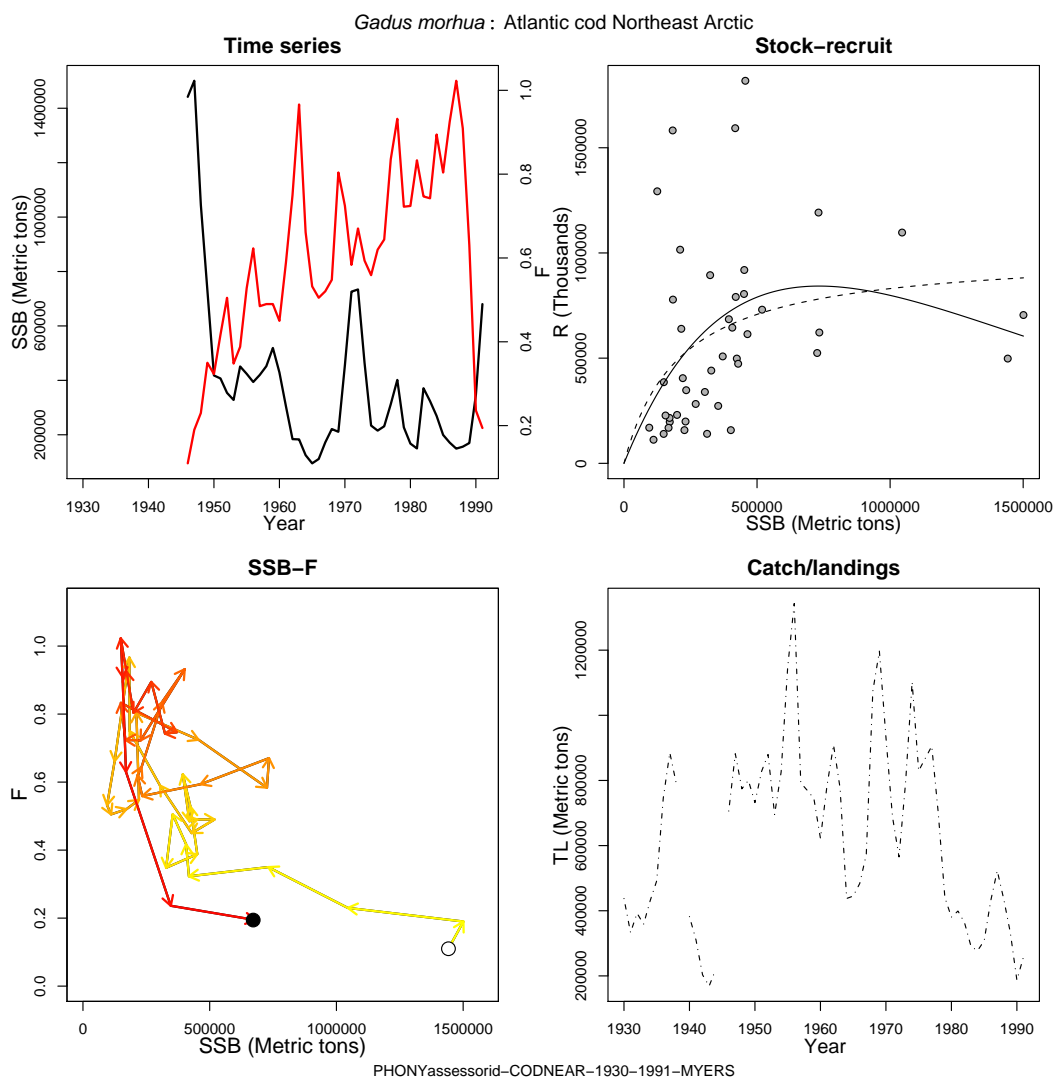


Gadus morhua - Atlantic cod

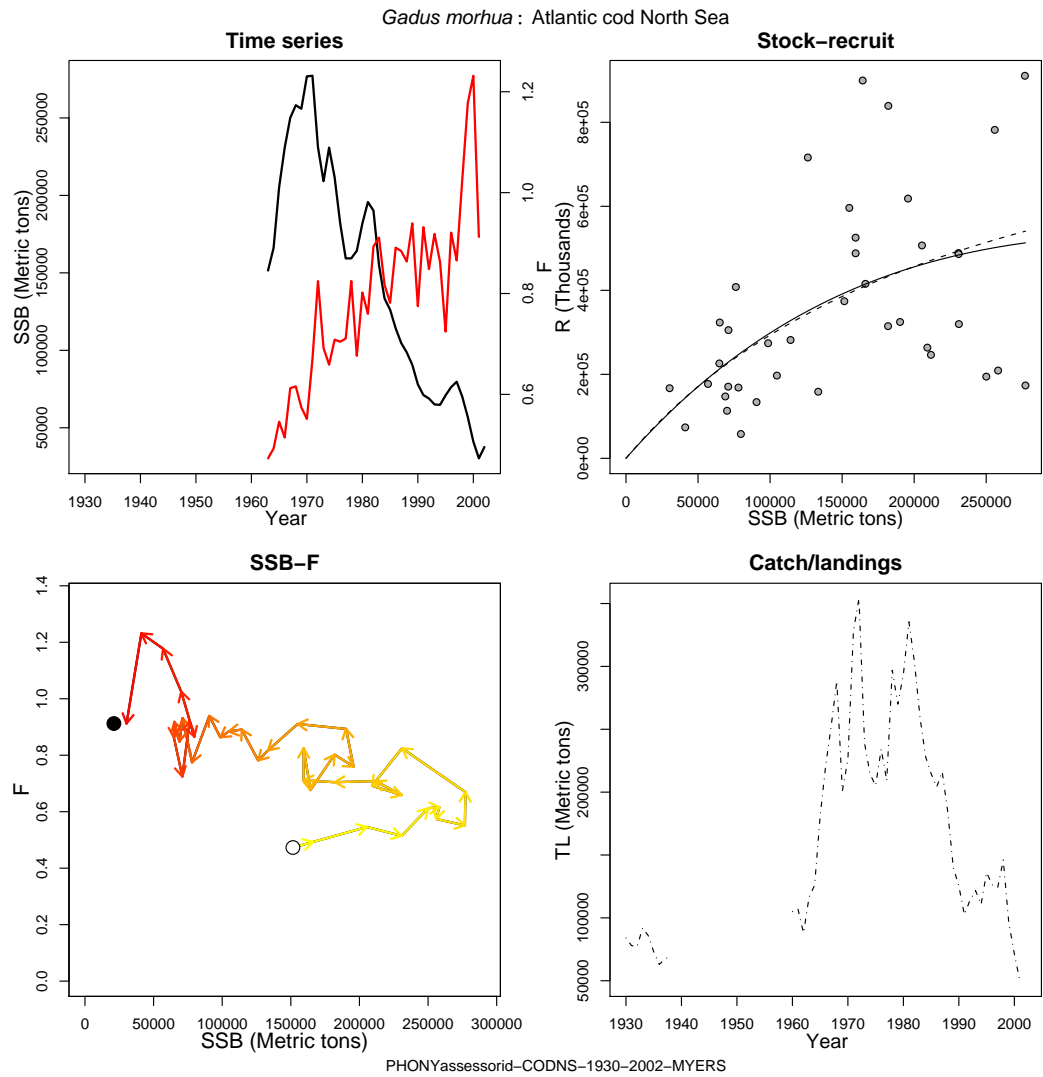
Gadus morhua : Atlantic cod Kattegat



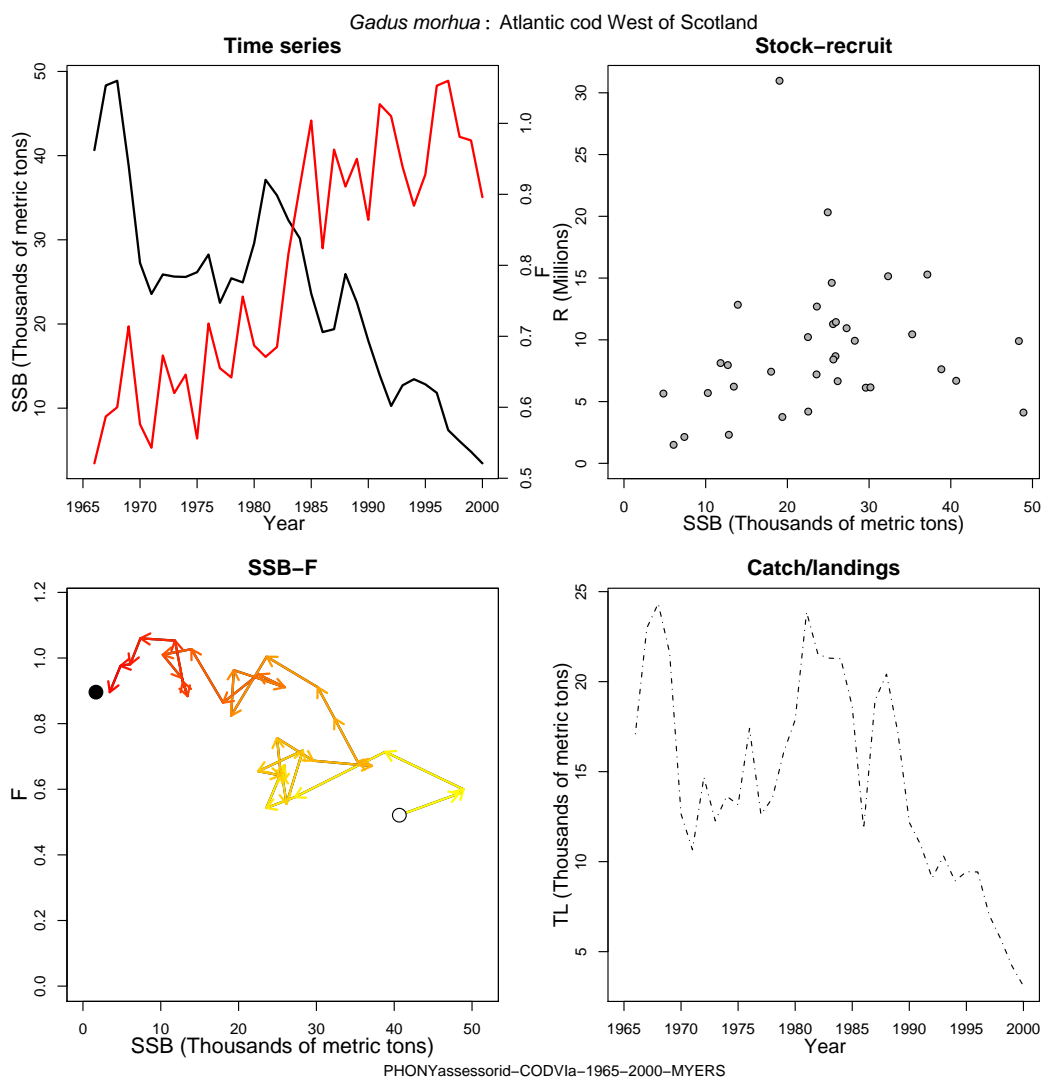
Gadus morhua - Atlantic cod



Gadus morhua - Atlantic cod

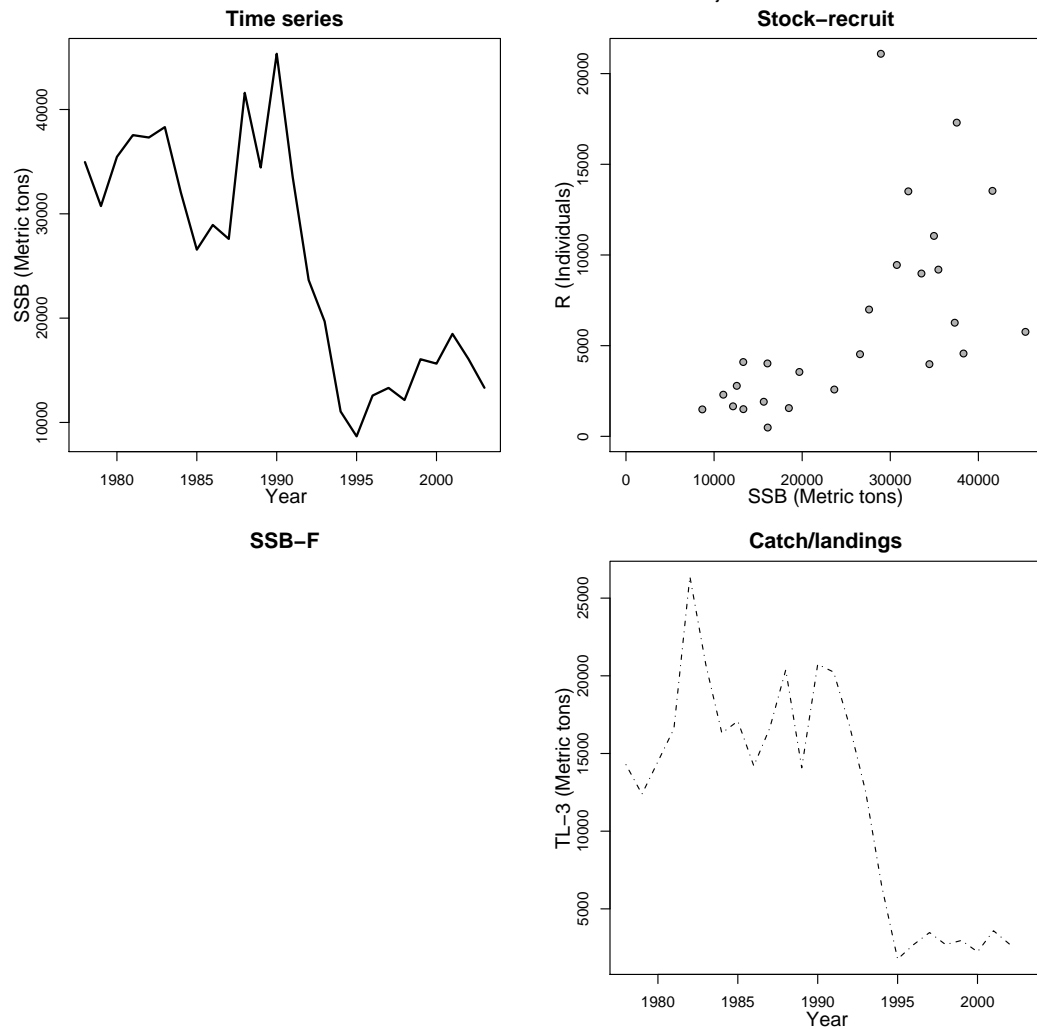


Gadus morhua - Atlantic cod



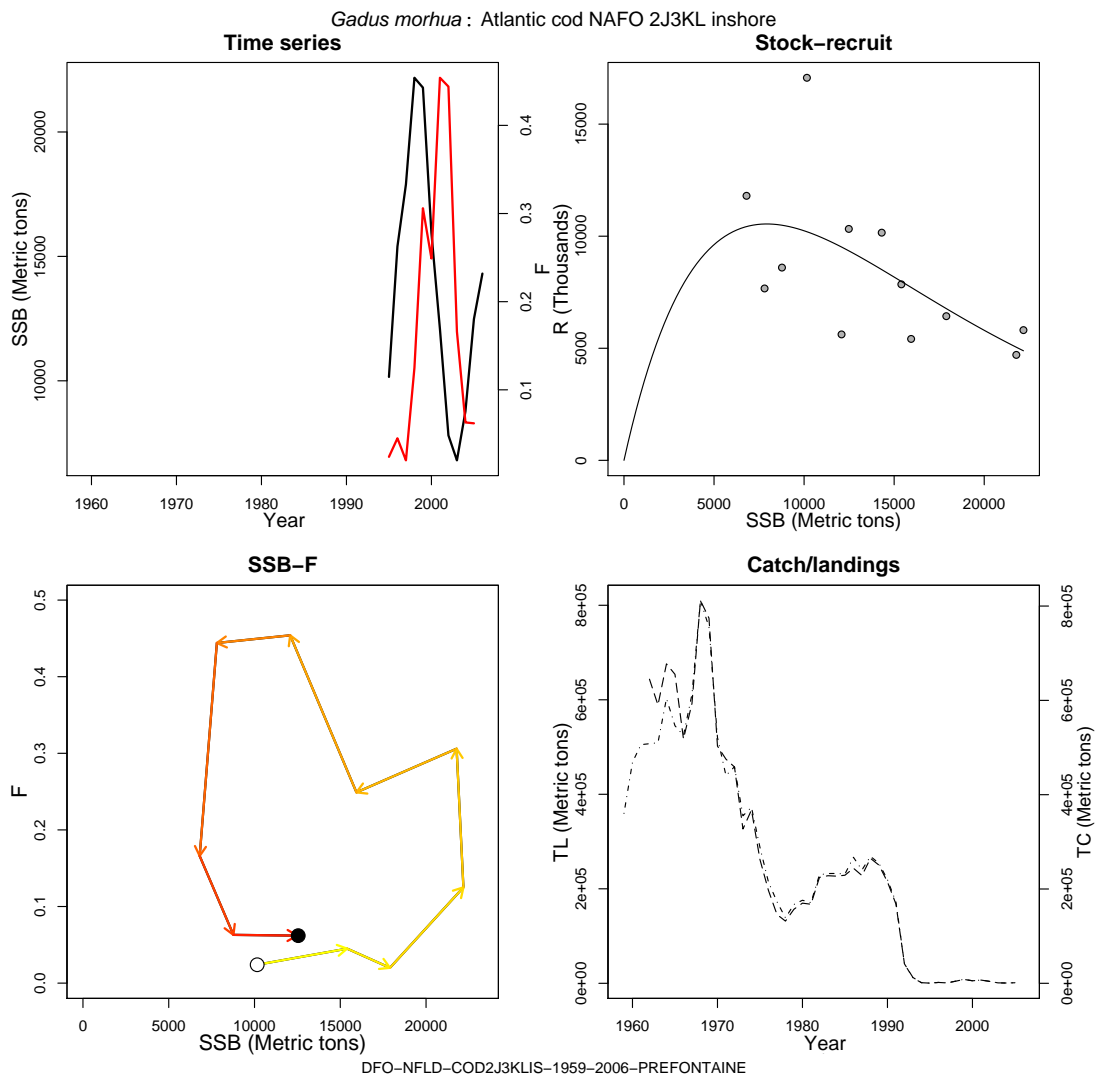
Gadus morhua - Atlantic cod

Gadus morhua : Atlantic cod NAFO 5Zjm

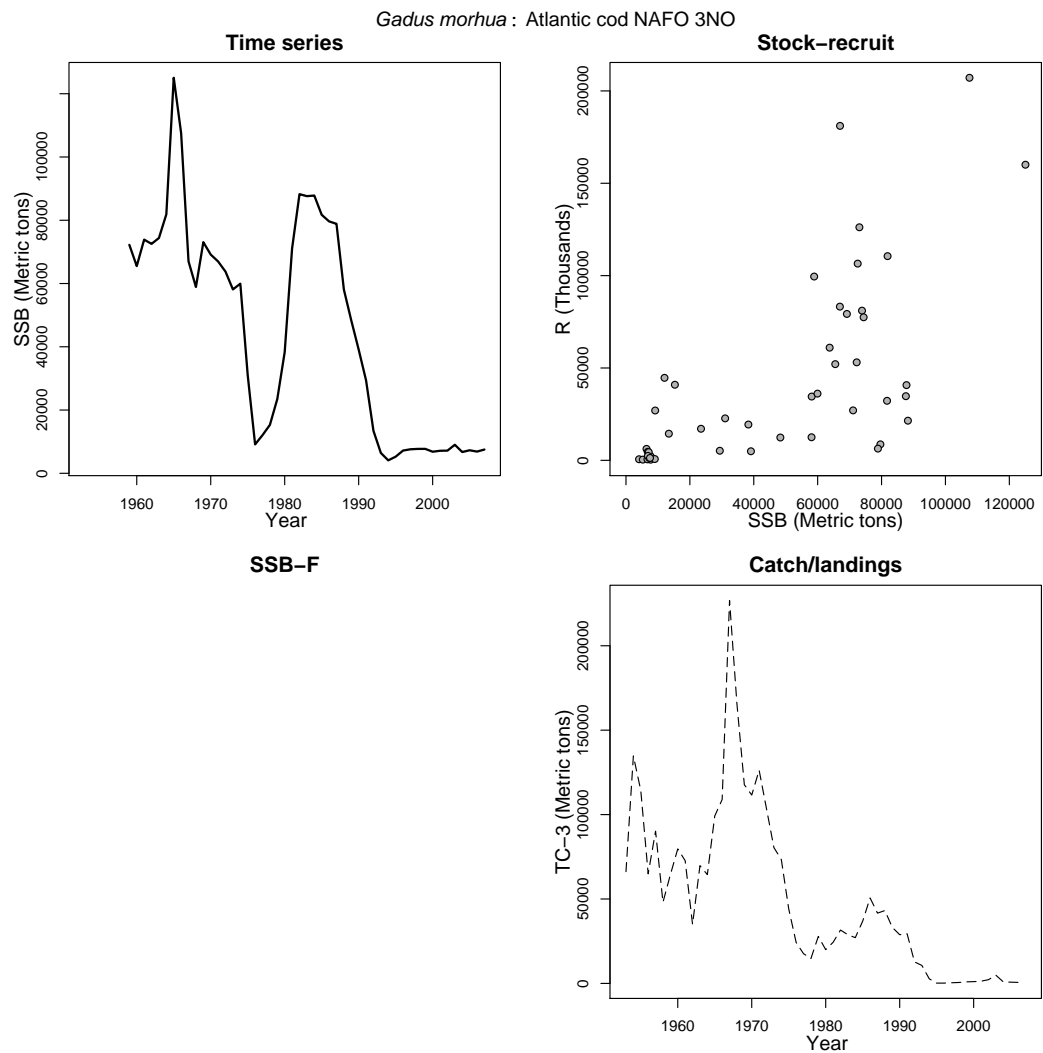


DFO-COD5Zjm-1978-2003-PREFONTAINE

Gadus morhua - Atlantic cod

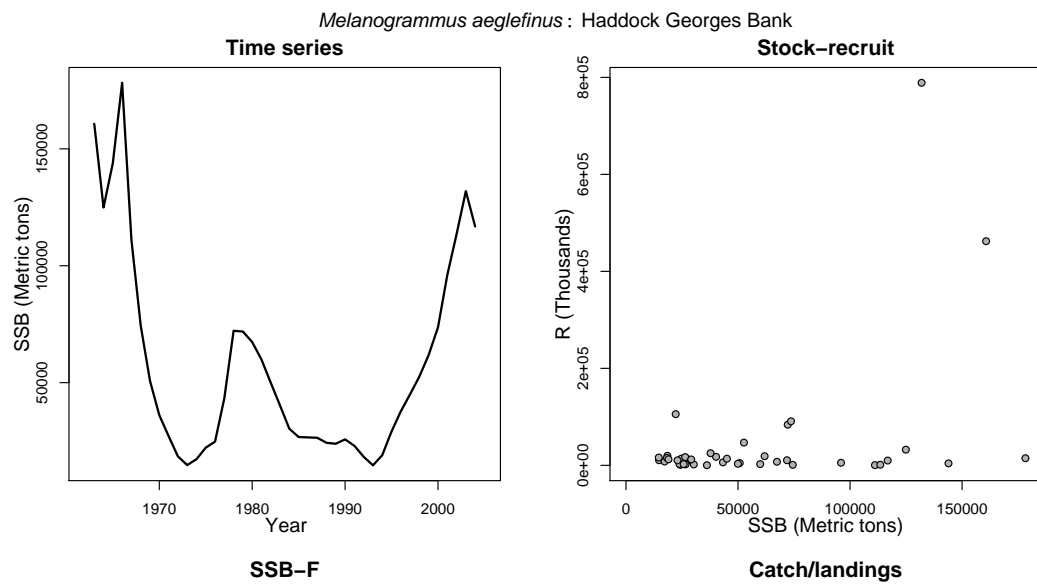


Gadus morhua - Atlantic cod



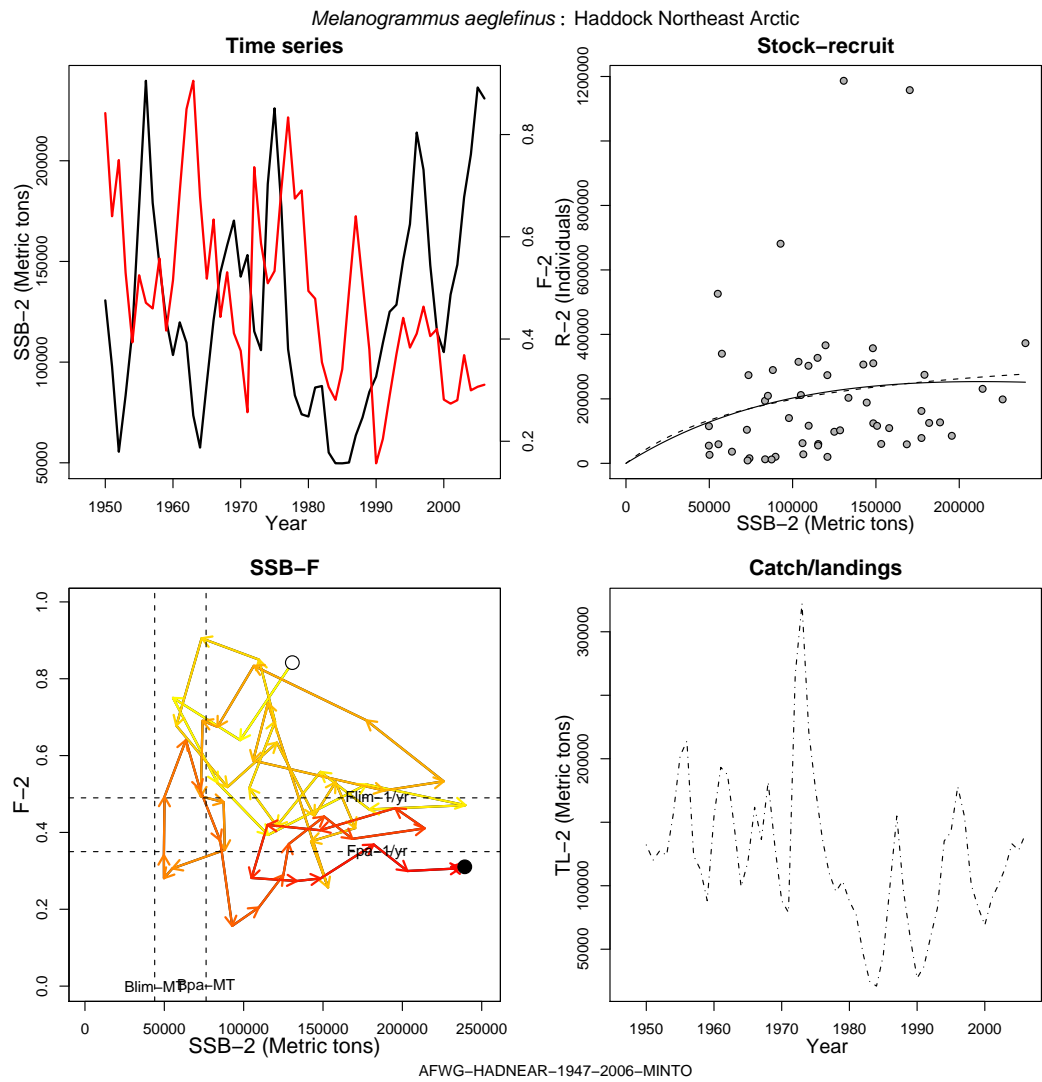
NAFO-SC-COD3NO-1953-2007-PREFONTAINE

Melanogrammus aeglefinus - Haddock

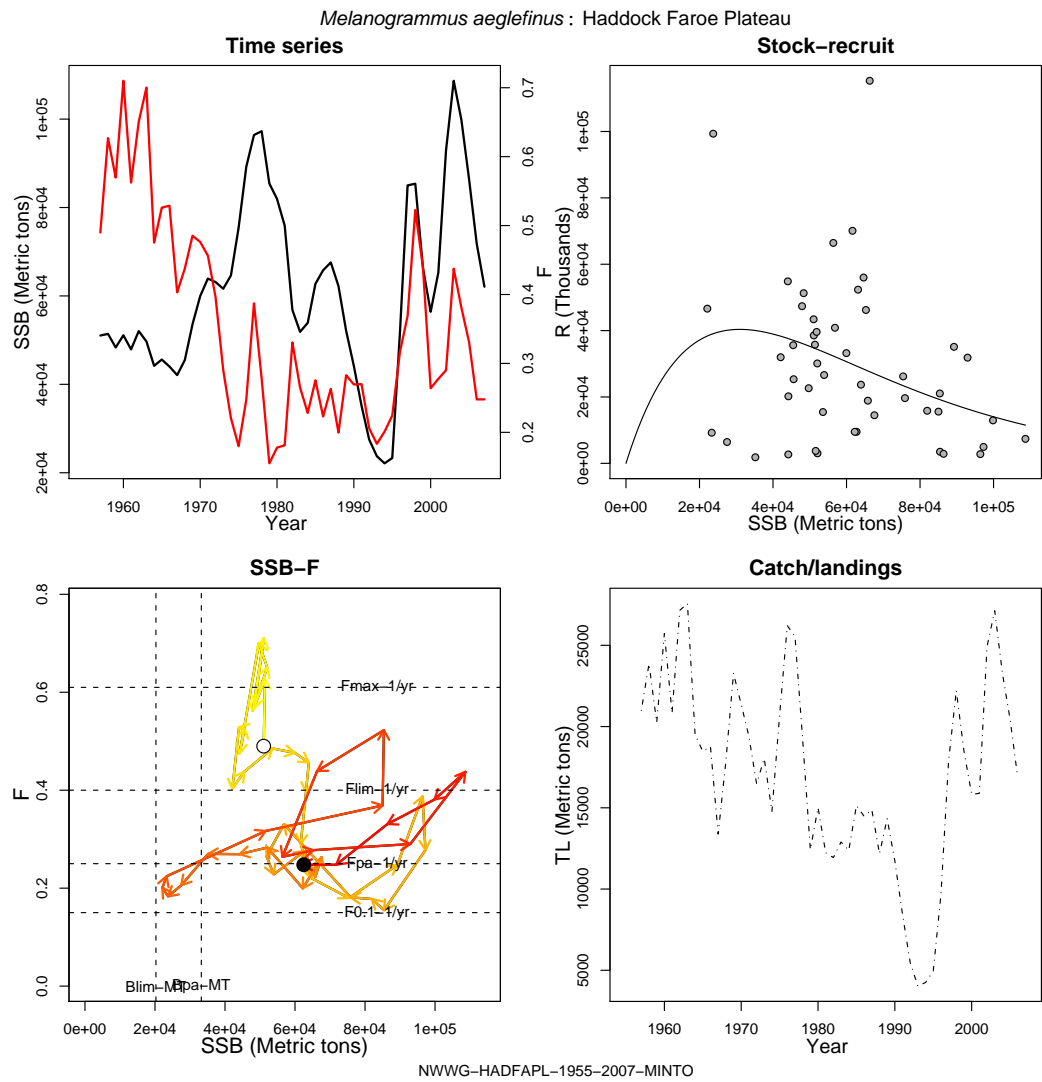


NMFS-HADGB-2005-FOGARTY

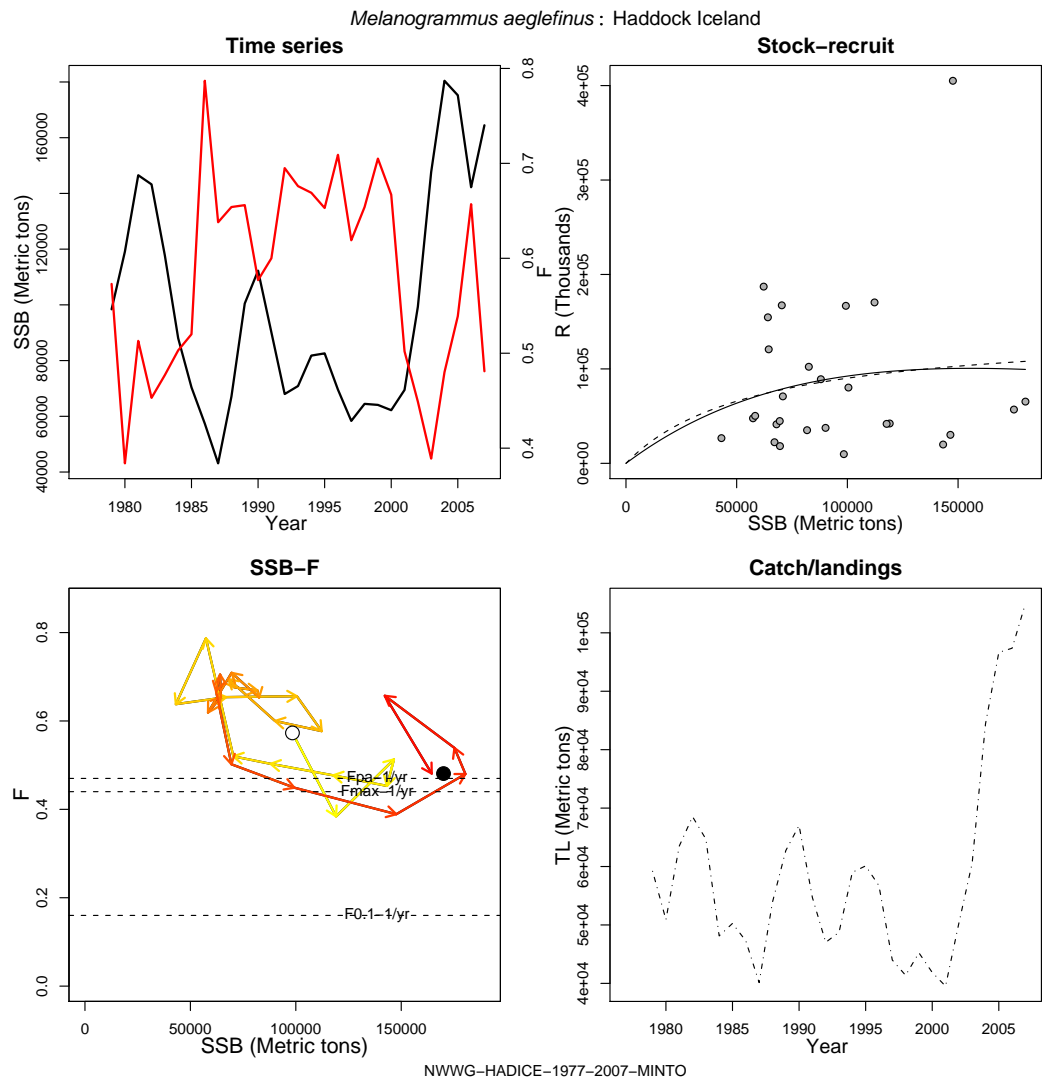
Melanogrammus aeglefinus - Haddock



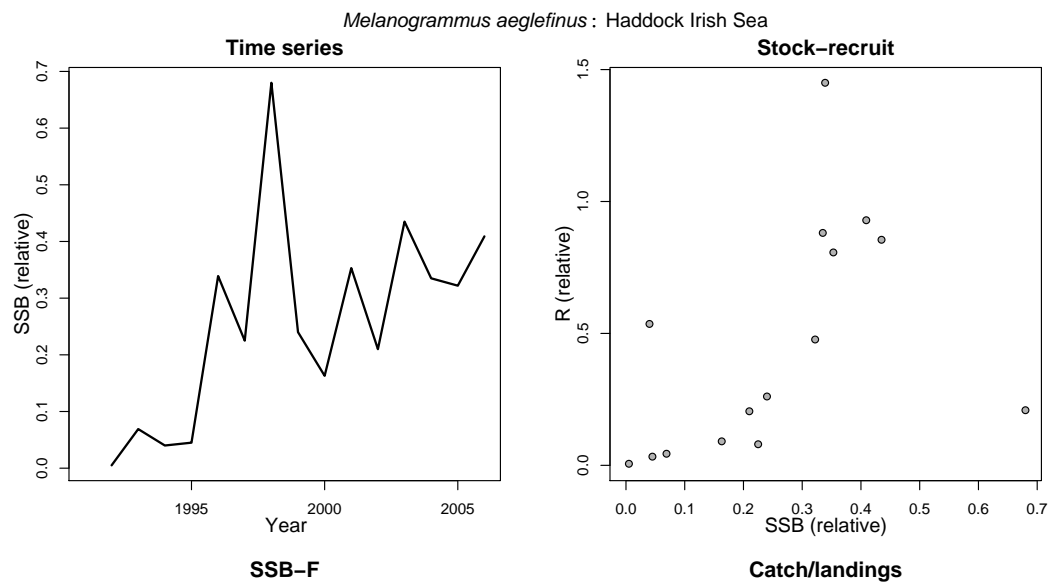
Melanogrammus aeglefinus - Haddock



Melanogrammus aeglefinus - Haddock

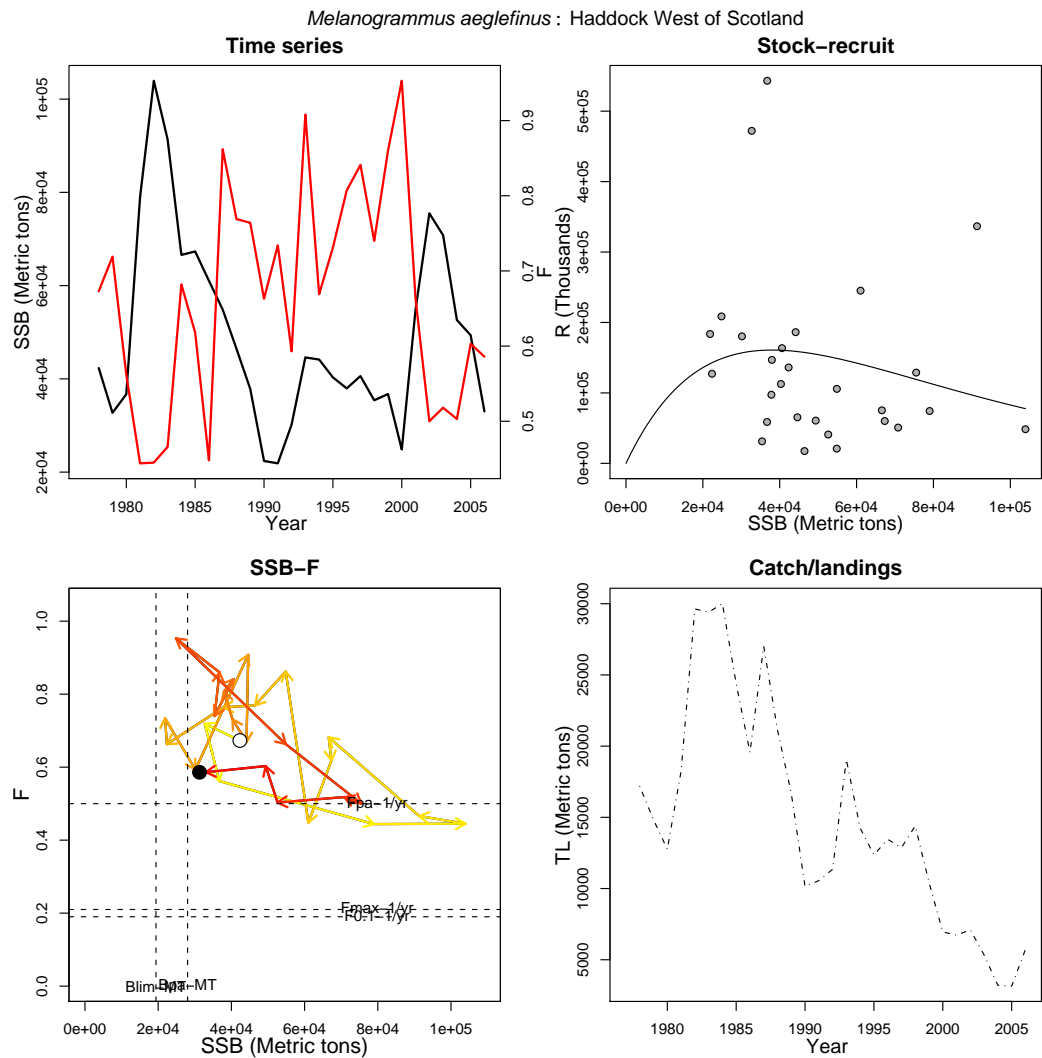


Melanogrammus aeglefinus - Haddock



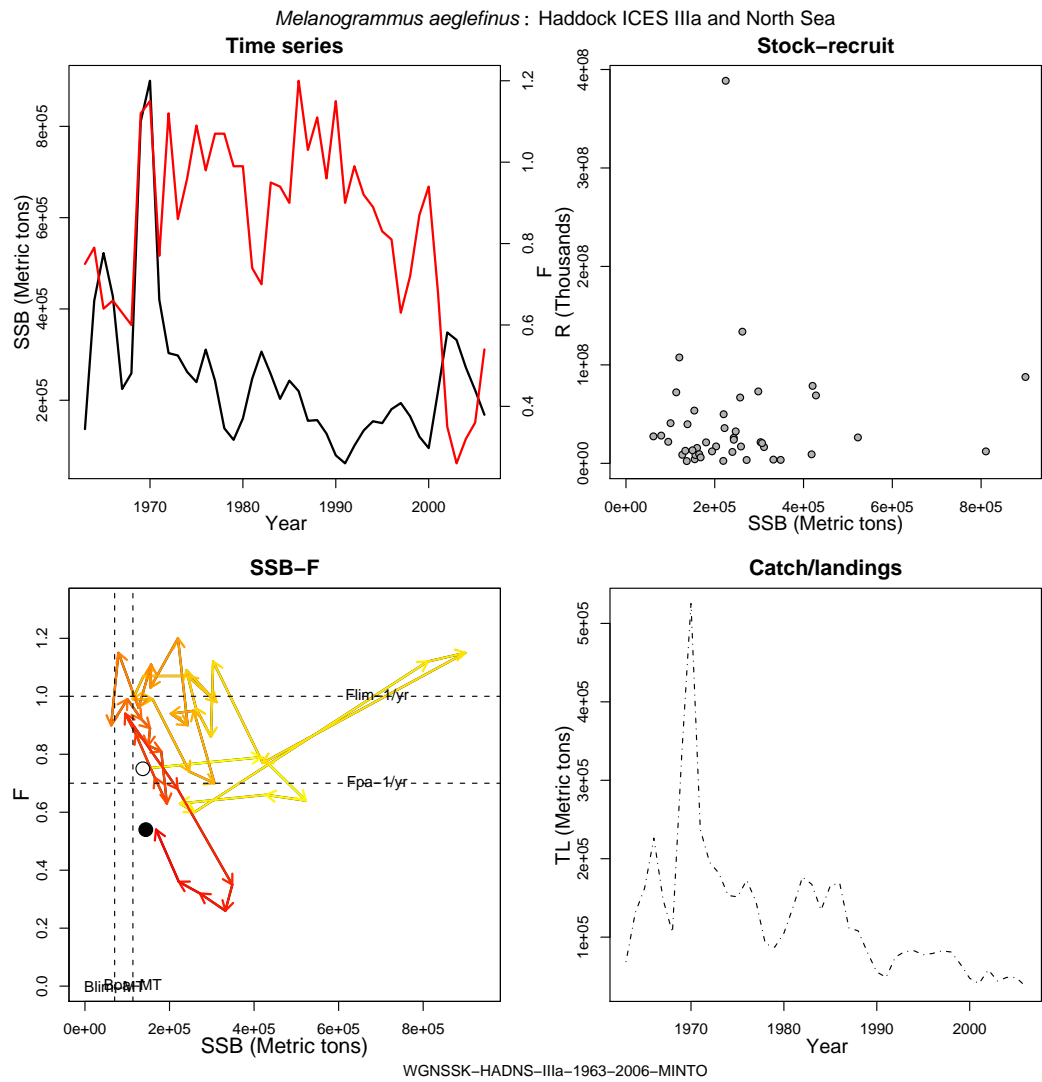
WGNSSDS-HADIS-1991-2006-MINTO

Melanogrammus aeglefinus - Haddock

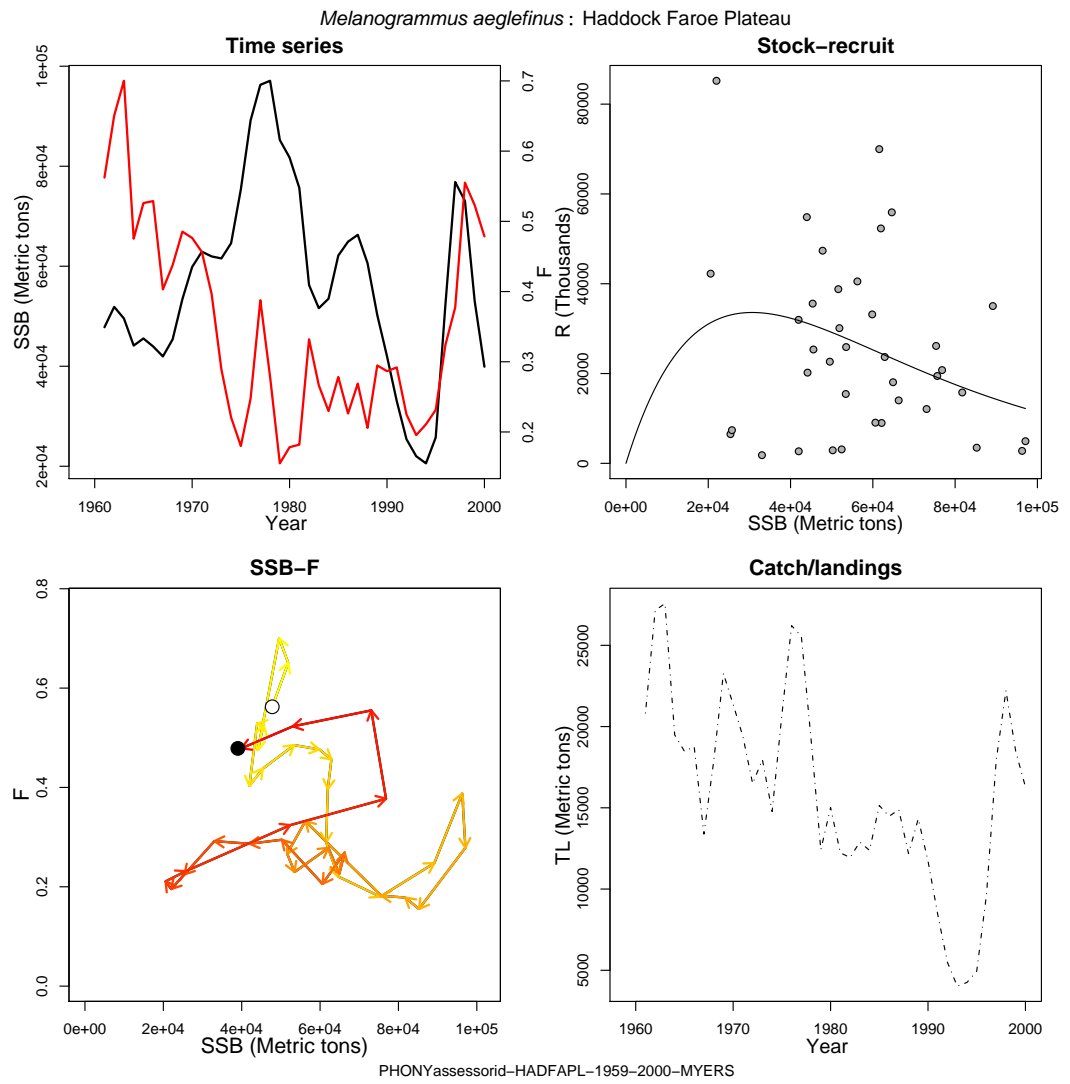


WGNSSDS-HADVIa-1977-2006-MINTO

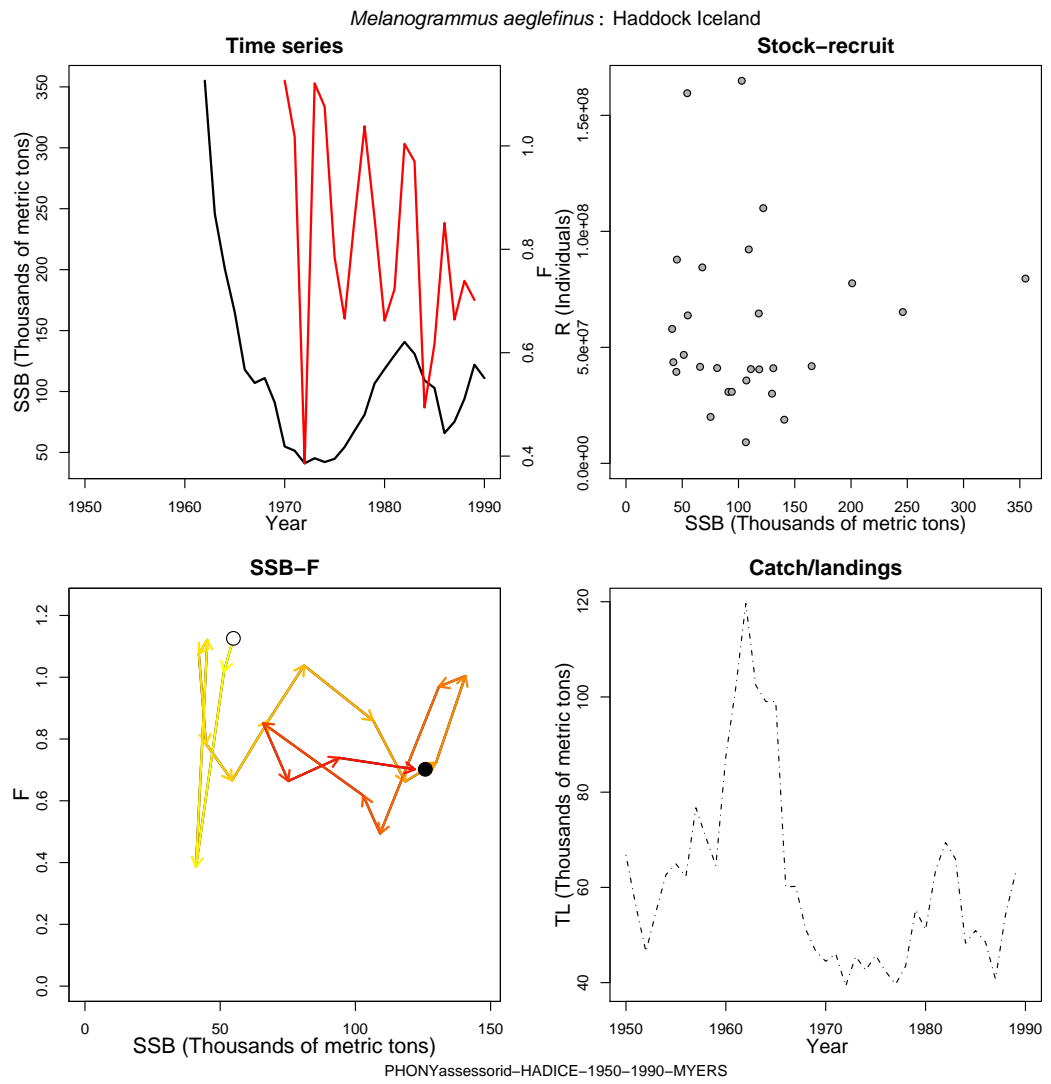
Melanogrammus aeglefinus - Haddock



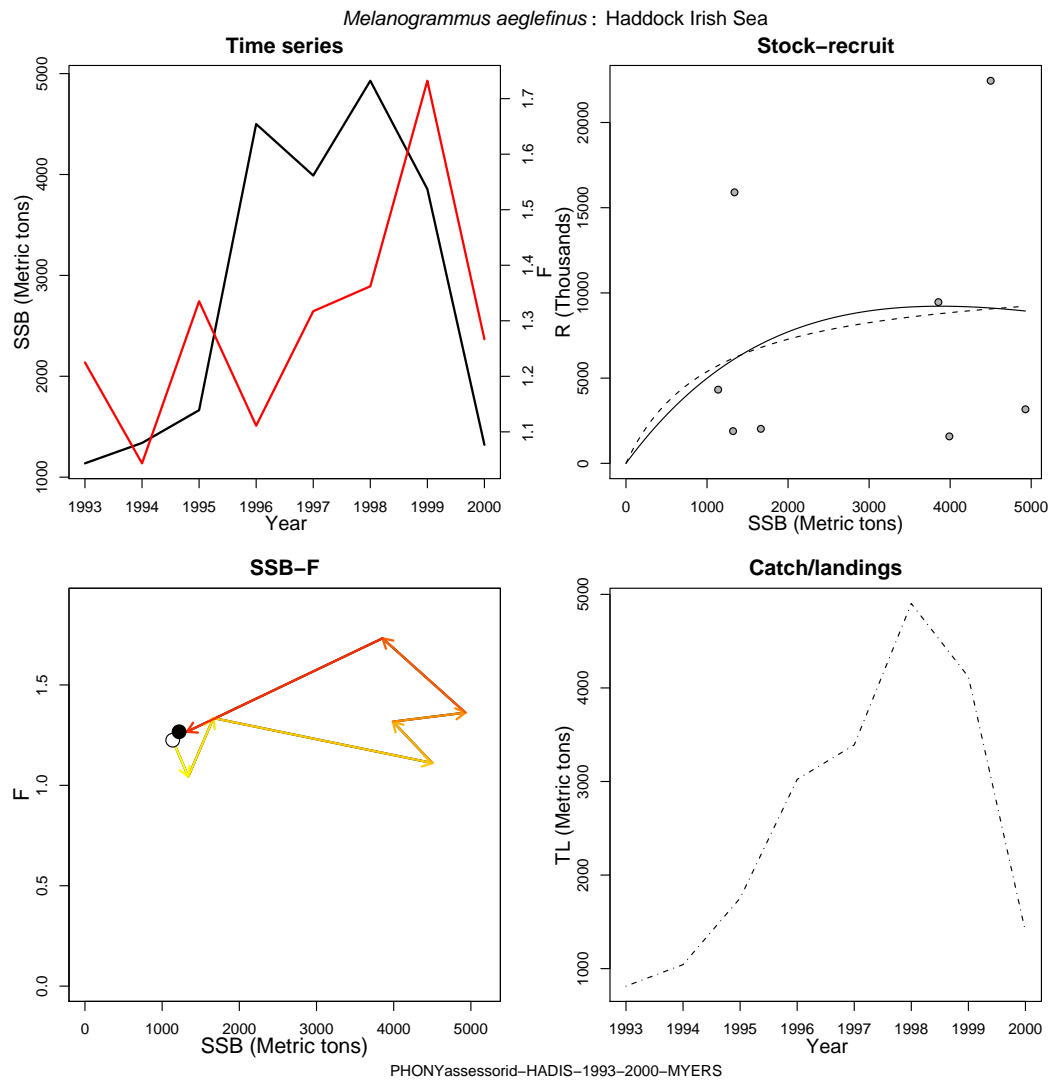
Melanogrammus aeglefinus - Haddock



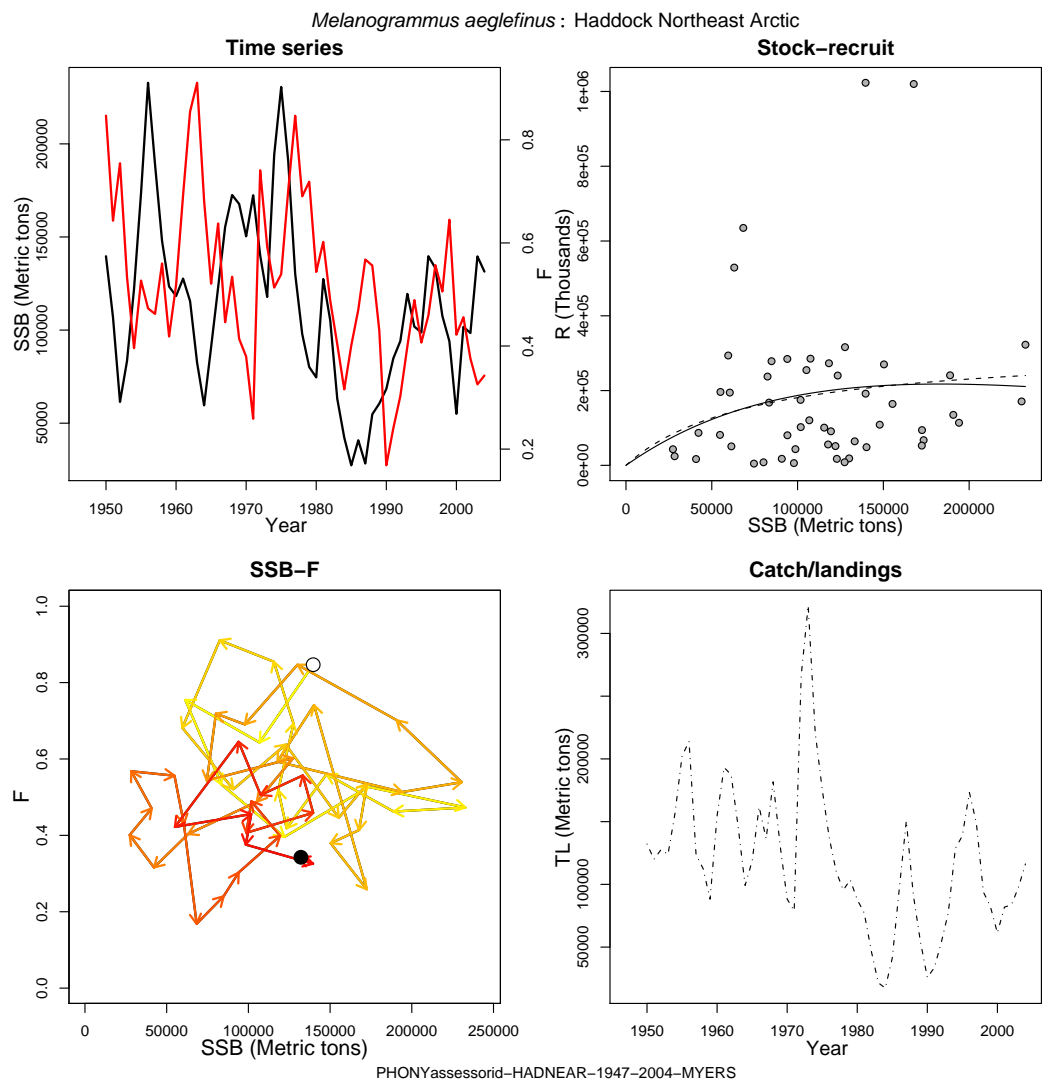
Melanogrammus aeglefinus - Haddock



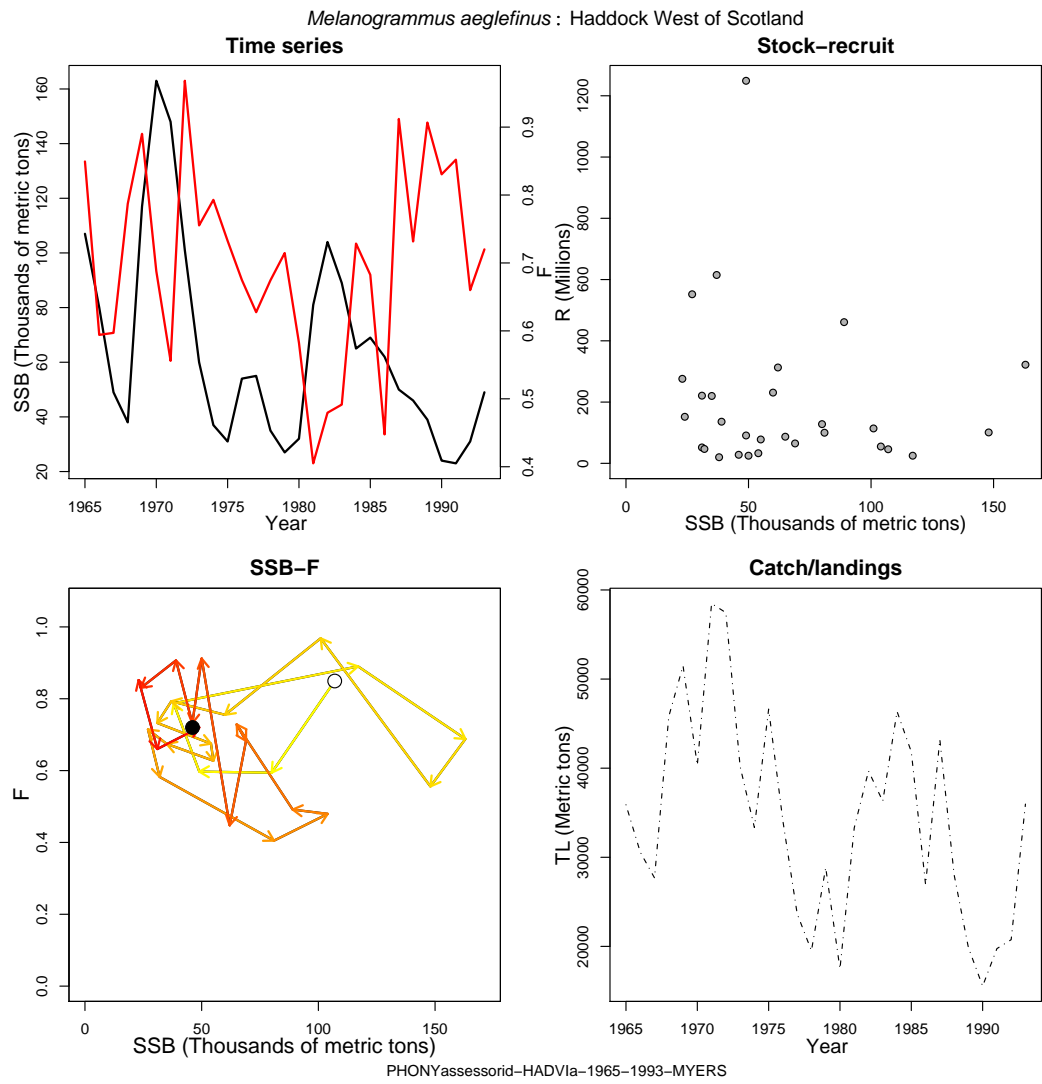
Melanogrammus aeglefinus - Haddock



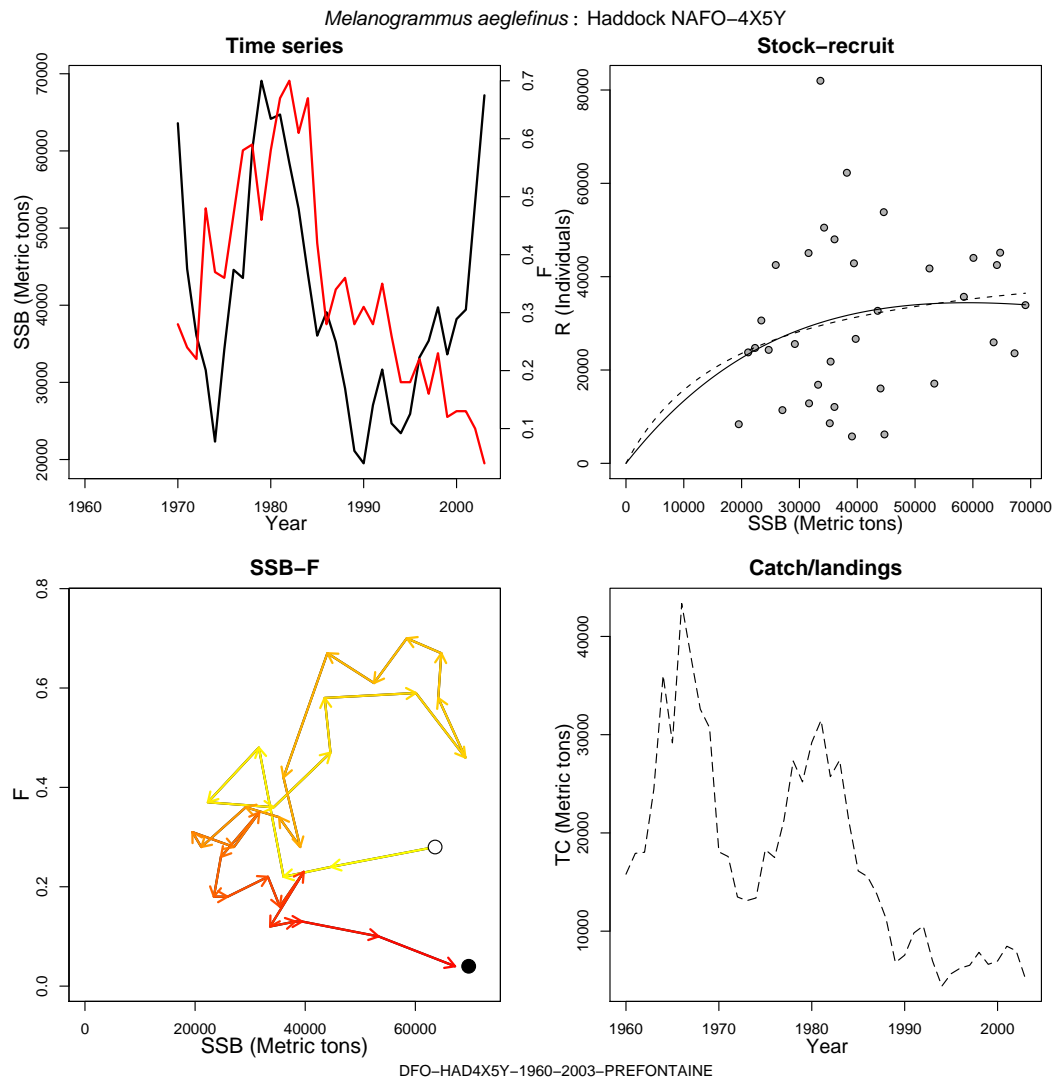
Melanogrammus aeglefinus - Haddock



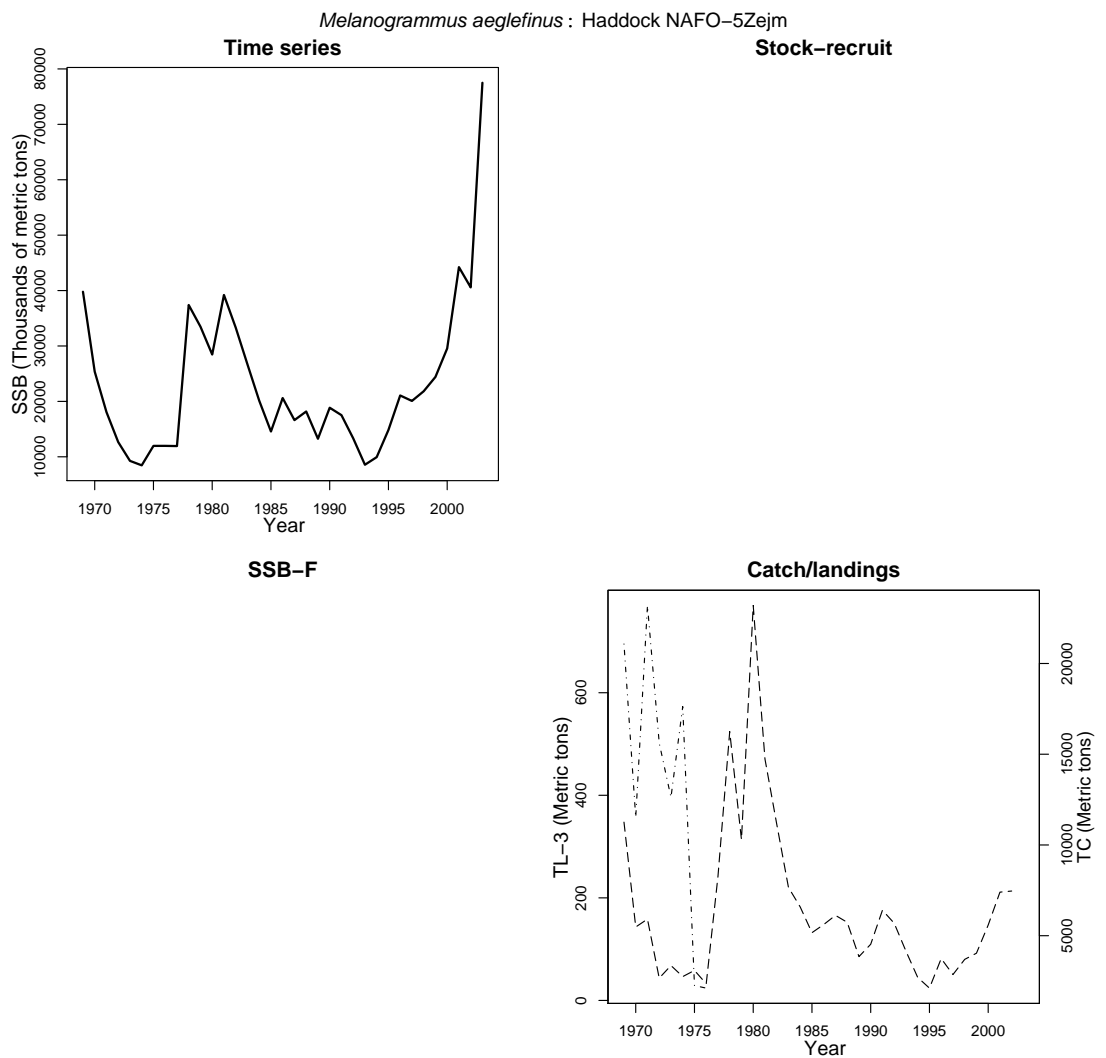
Melanogrammus aeglefinus - Haddock



Melanogrammus aeglefinus - Haddock

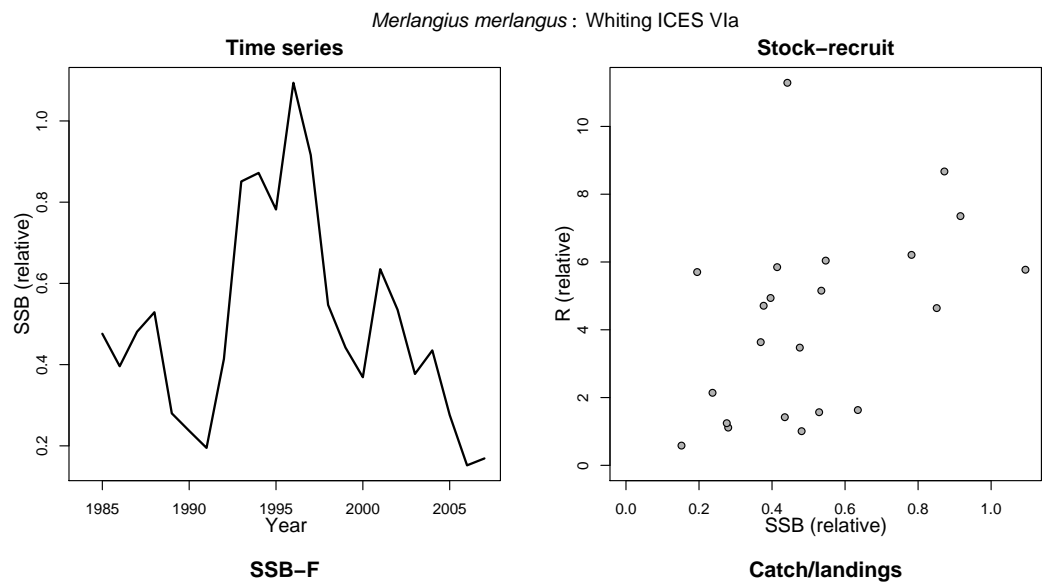


Melanogrammus aeglefinus - Haddock



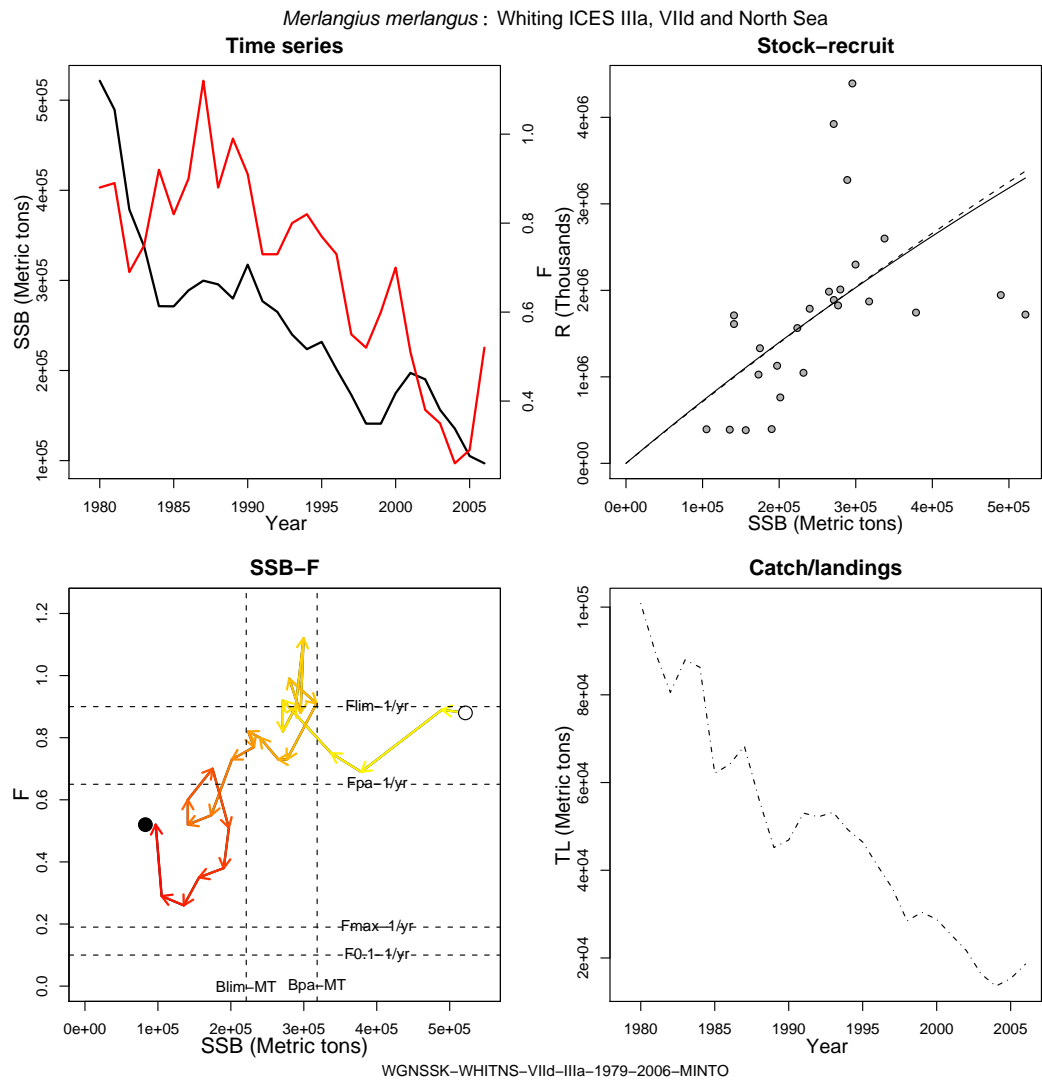
DFO-HAD5Zejm-1969-2003-PREFONTAINE

Merlangius merlangus - Whiting

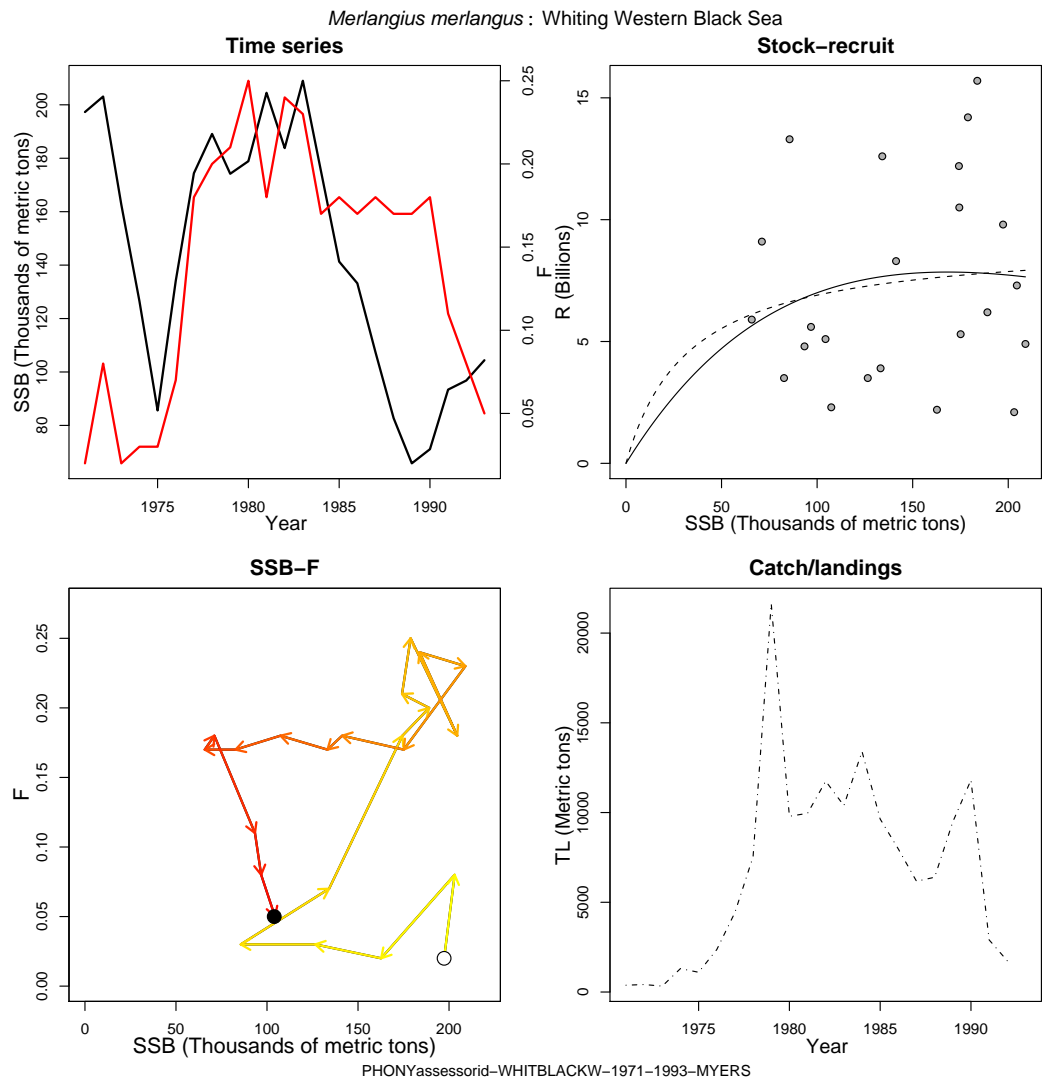


WGNSDS-WHITVIa-1984-2007-MINTO

Merlangius merlangus - Whiting

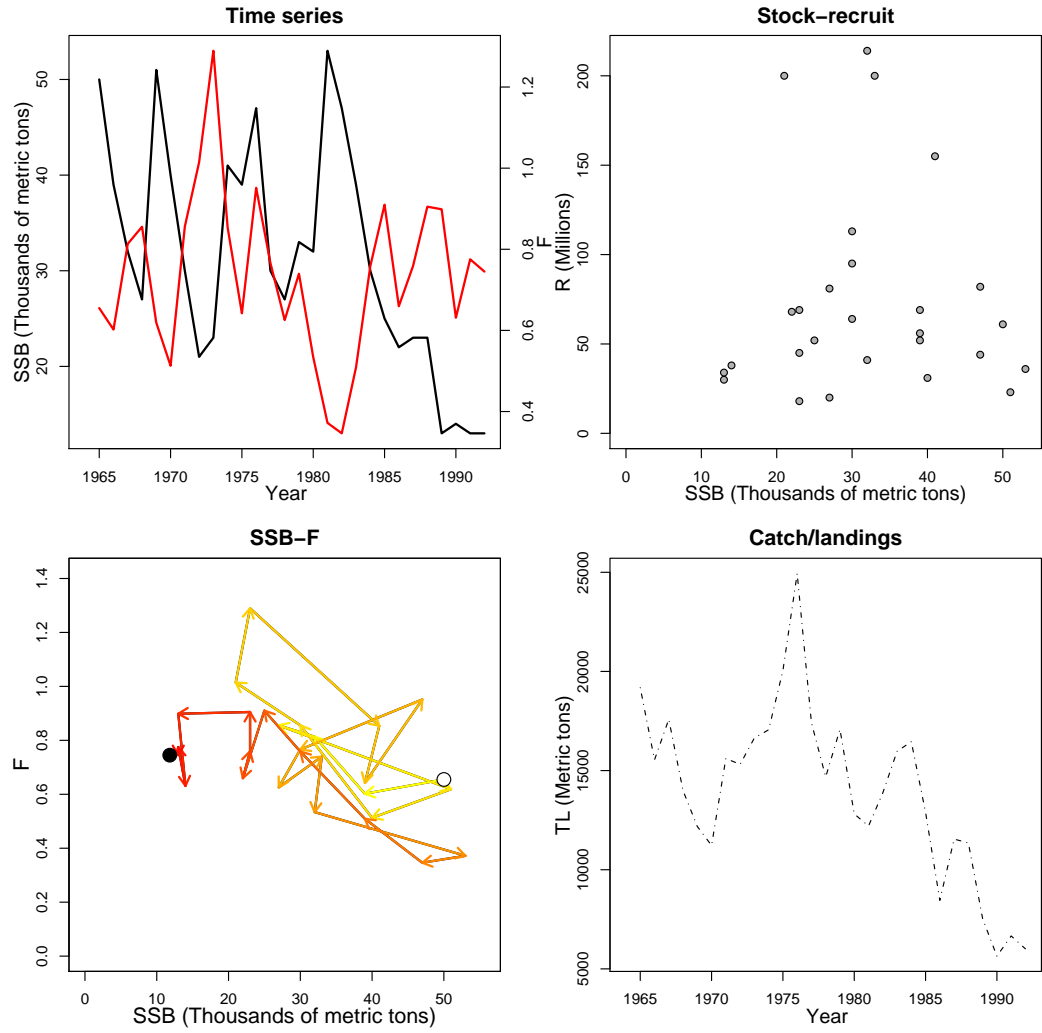


Merlangius merlangus - Whiting



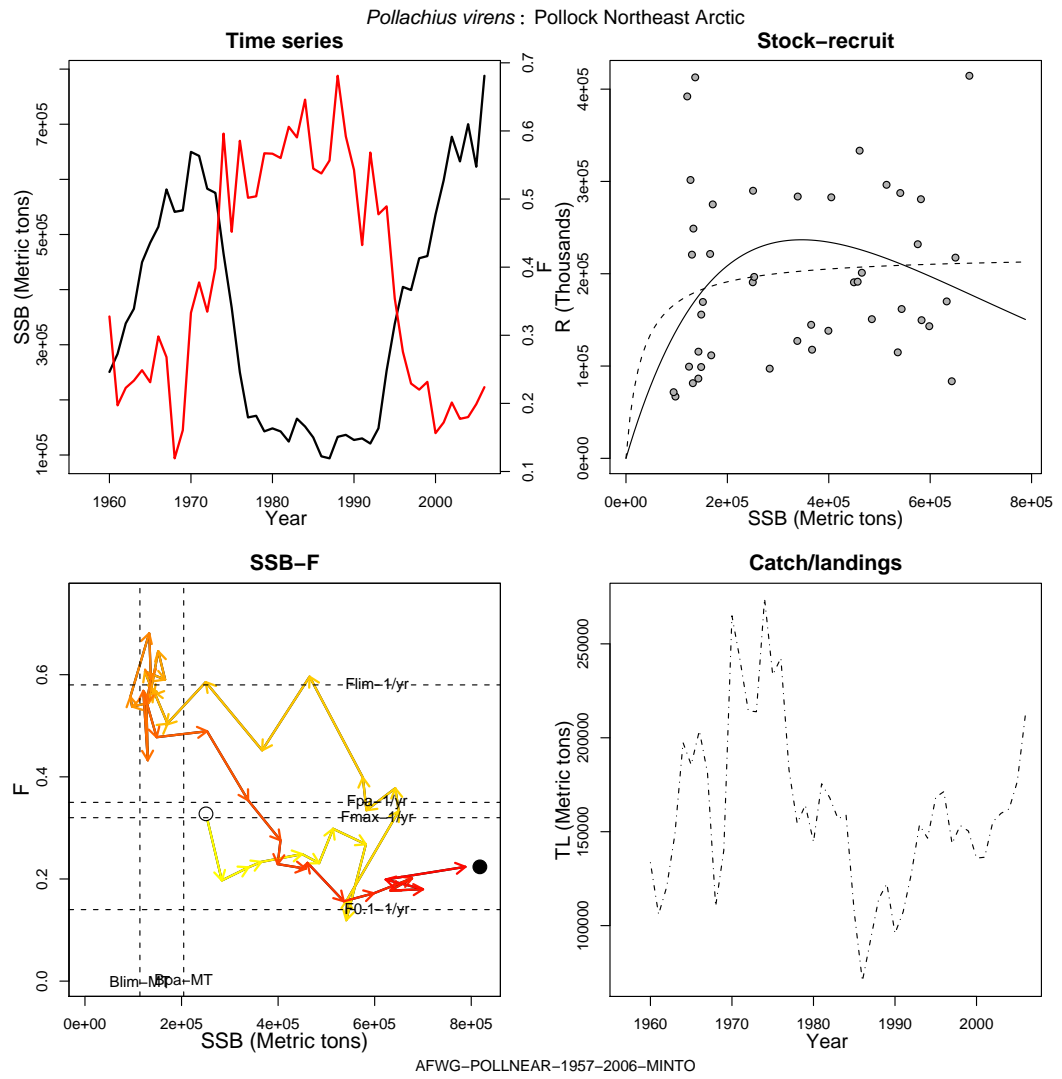
Merlangius merlangus - Whiting

Merlangius merlangus : Whiting ICES Vla

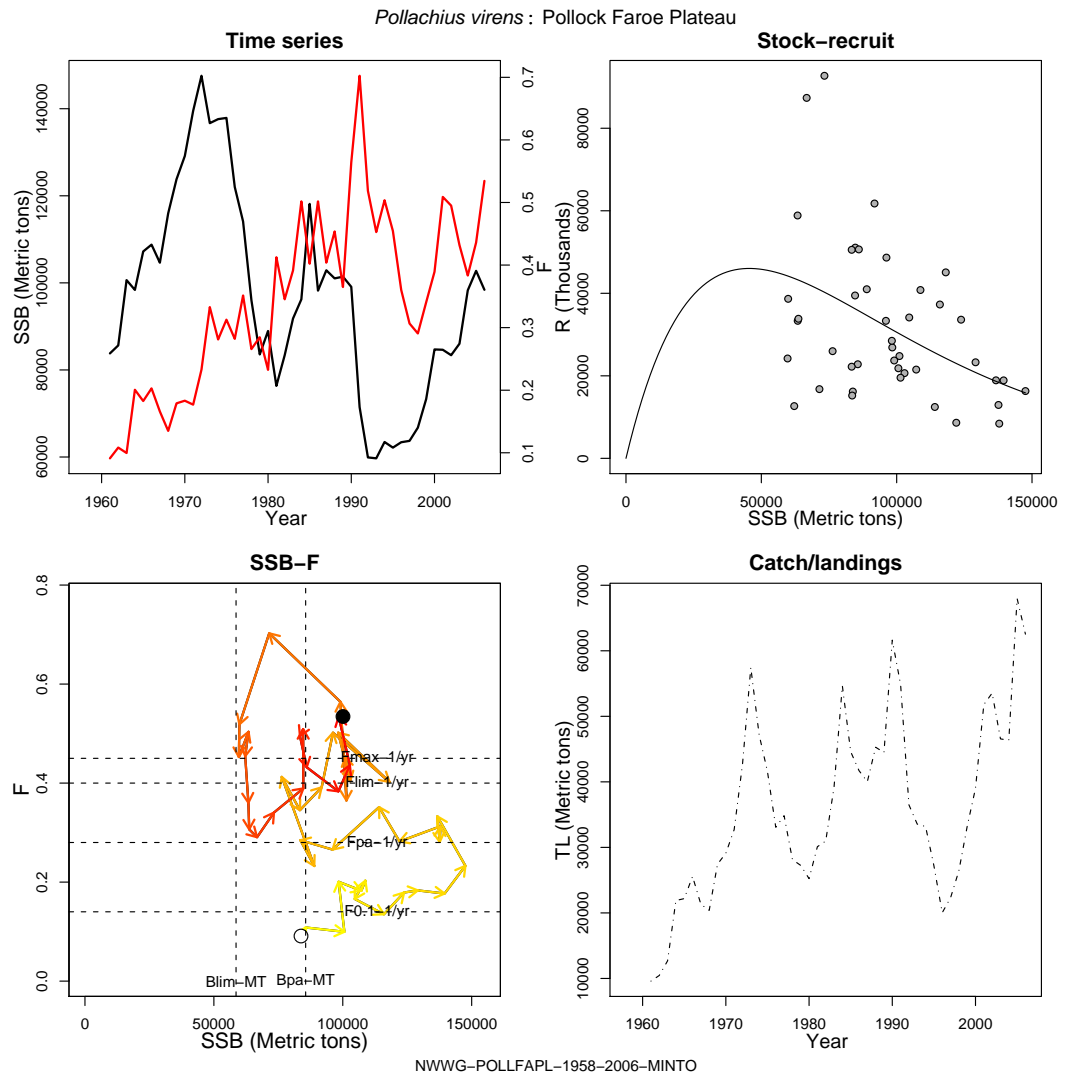


PHONYassessorid-WHITVla-1964-1992-MYERS

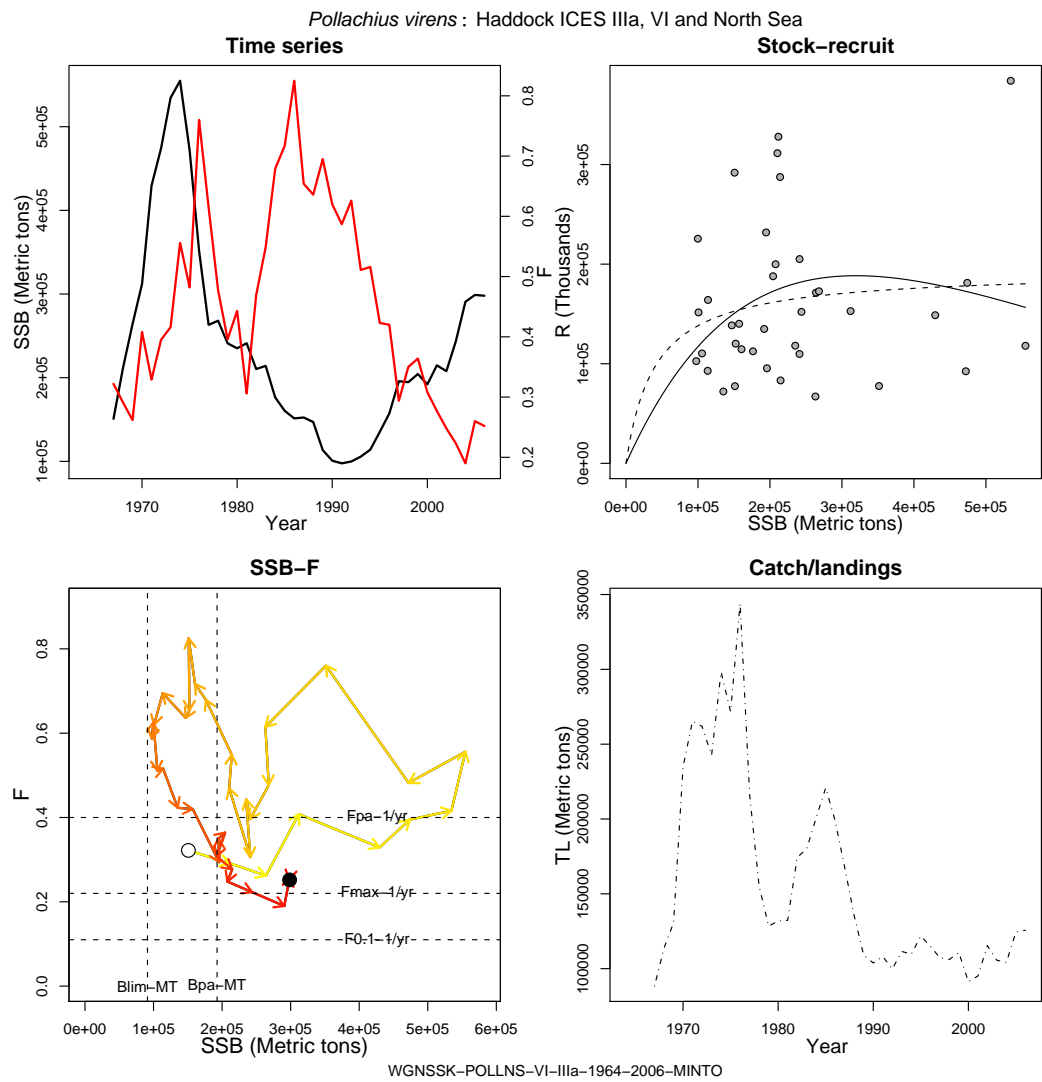
Pollachius virens - Pollock



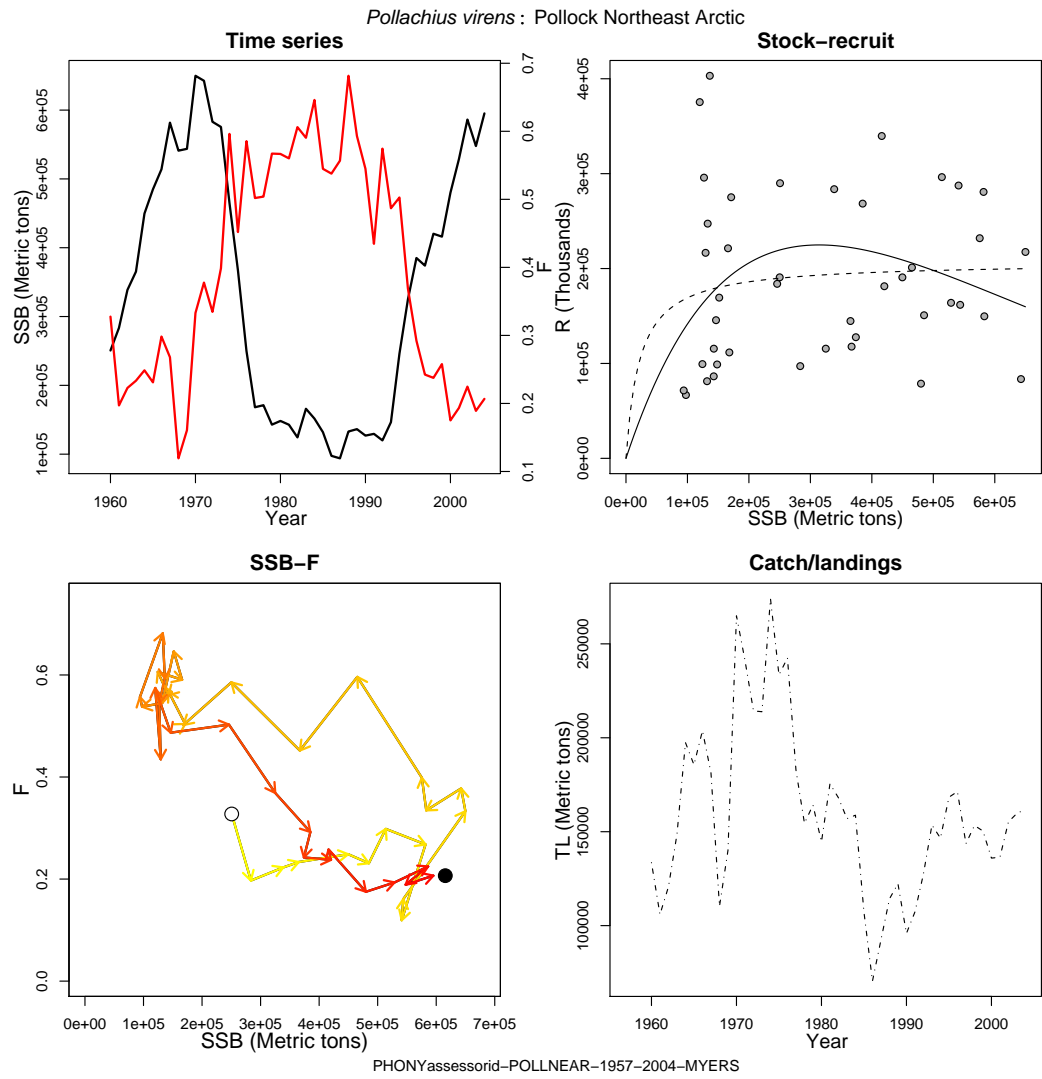
Pollachius virens - Pollock



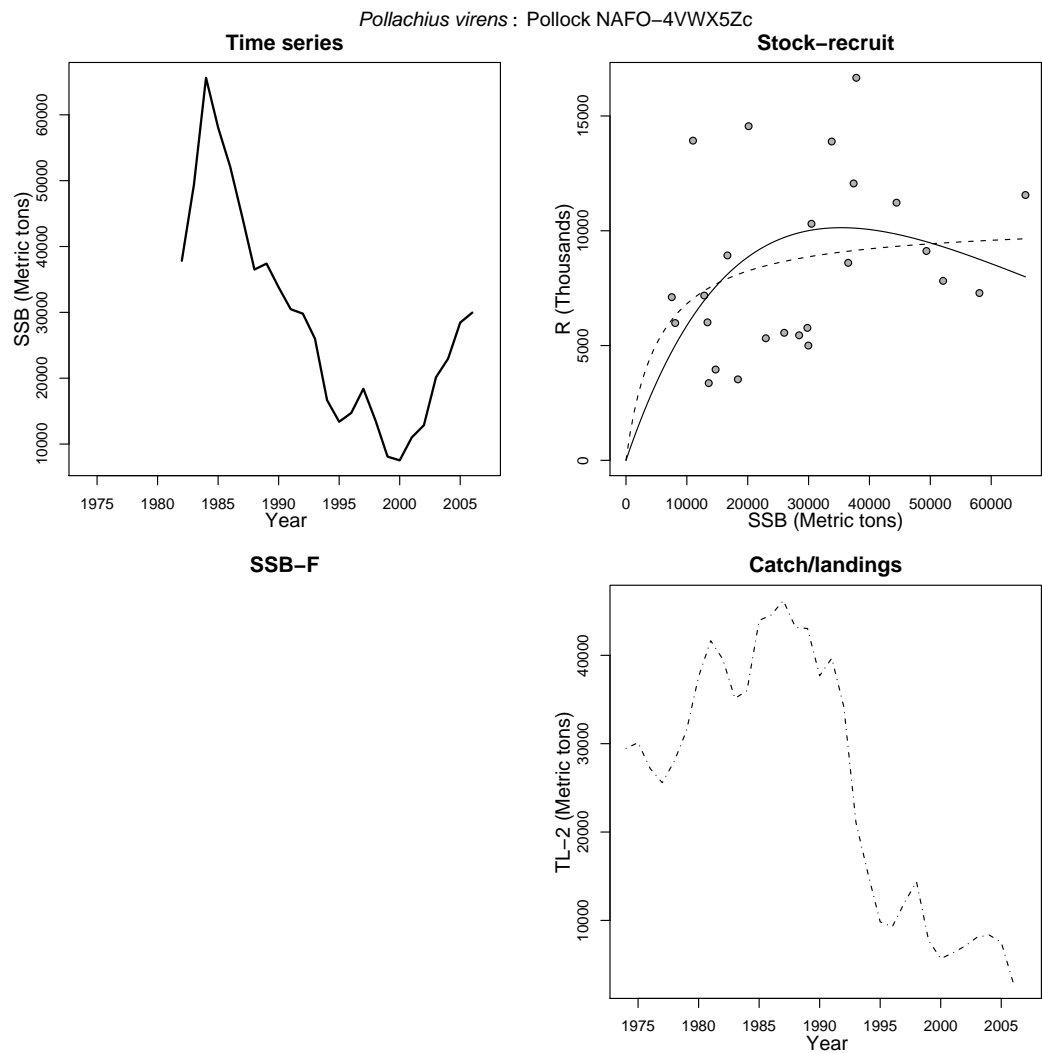
Pollachius virens - Pollock



Pollachius virens - Pollock



Pollachius virens - Pollock

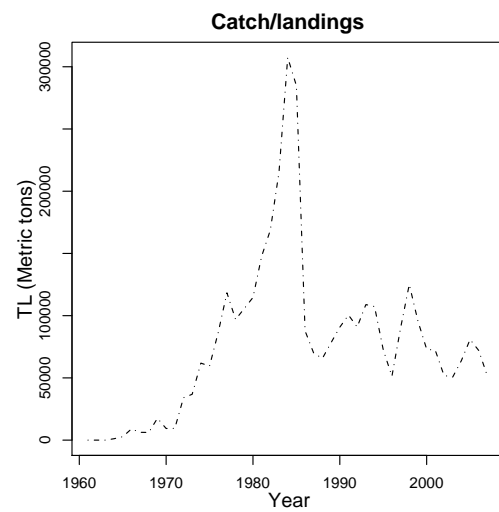


DFO-POLL4VWX5Zc-1974-2007-PREFONTAINE

Theragra chalcogramma - Walleye pollock

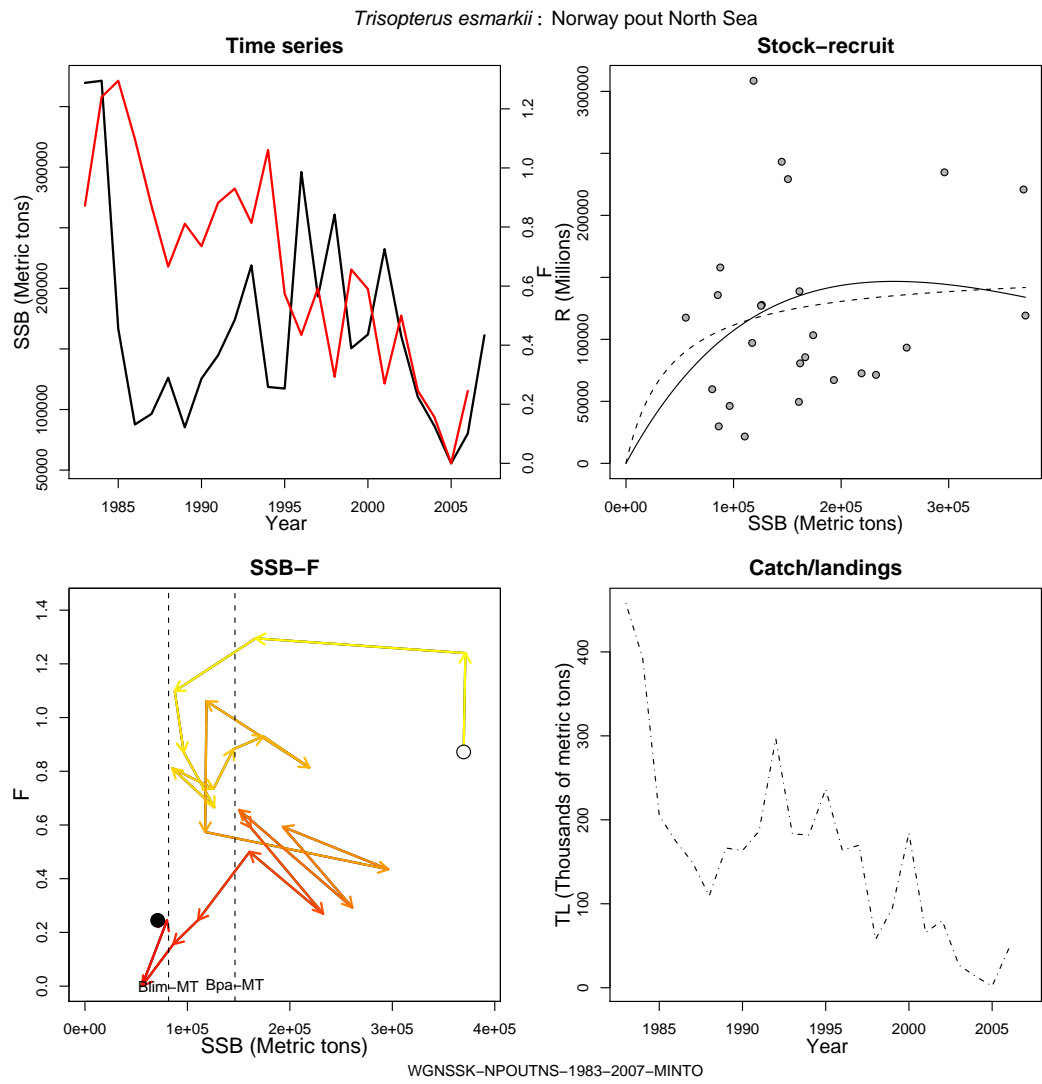
Theragra chalcogramma : Walleye pollock Gulf of Alaska
Time series **Stock-recruit**

SSB-F

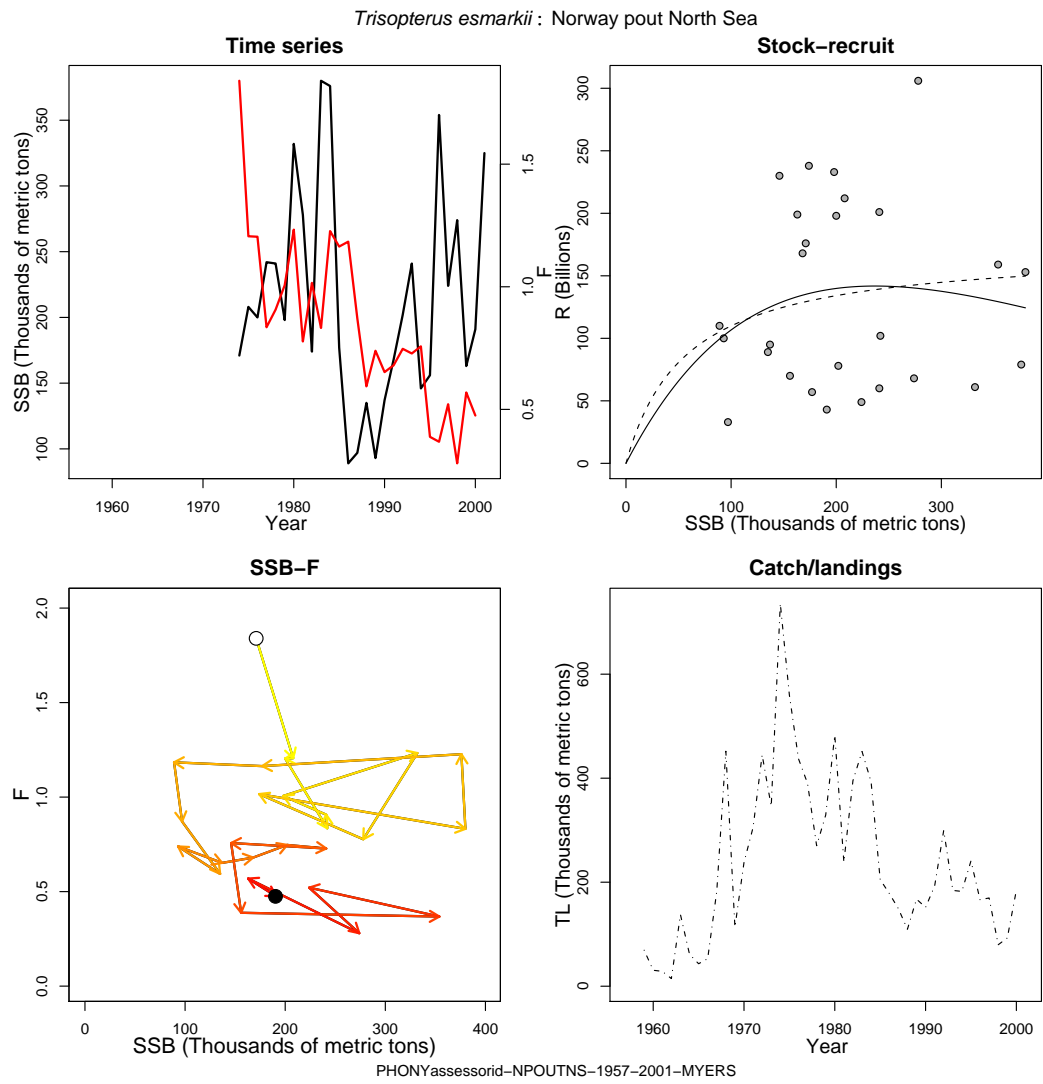


NMFS-WPOLLGA-2007-FOGARTY

Trisopterus esmarkii - Norway Pout

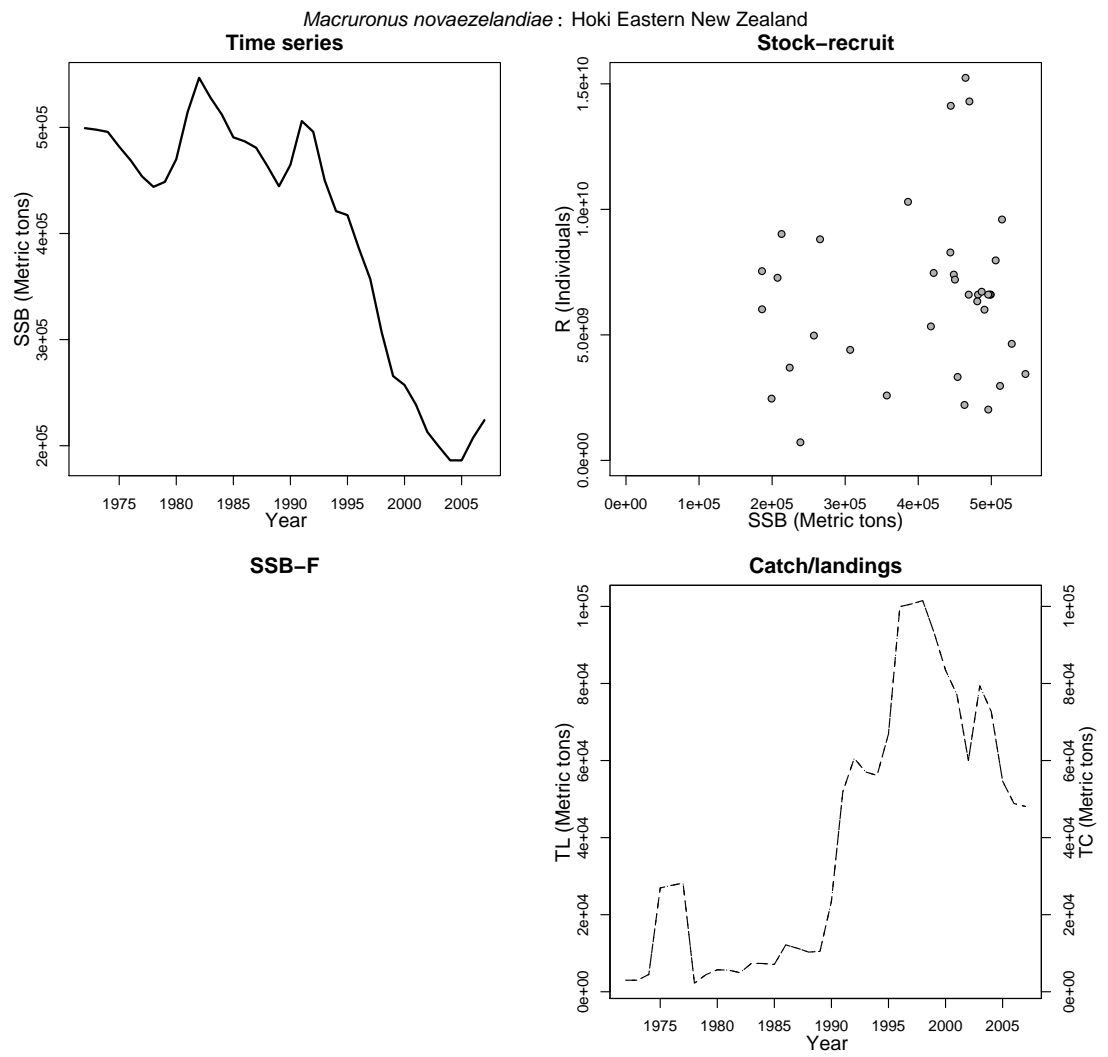


Trisopterus esmarkii - Norway Pout

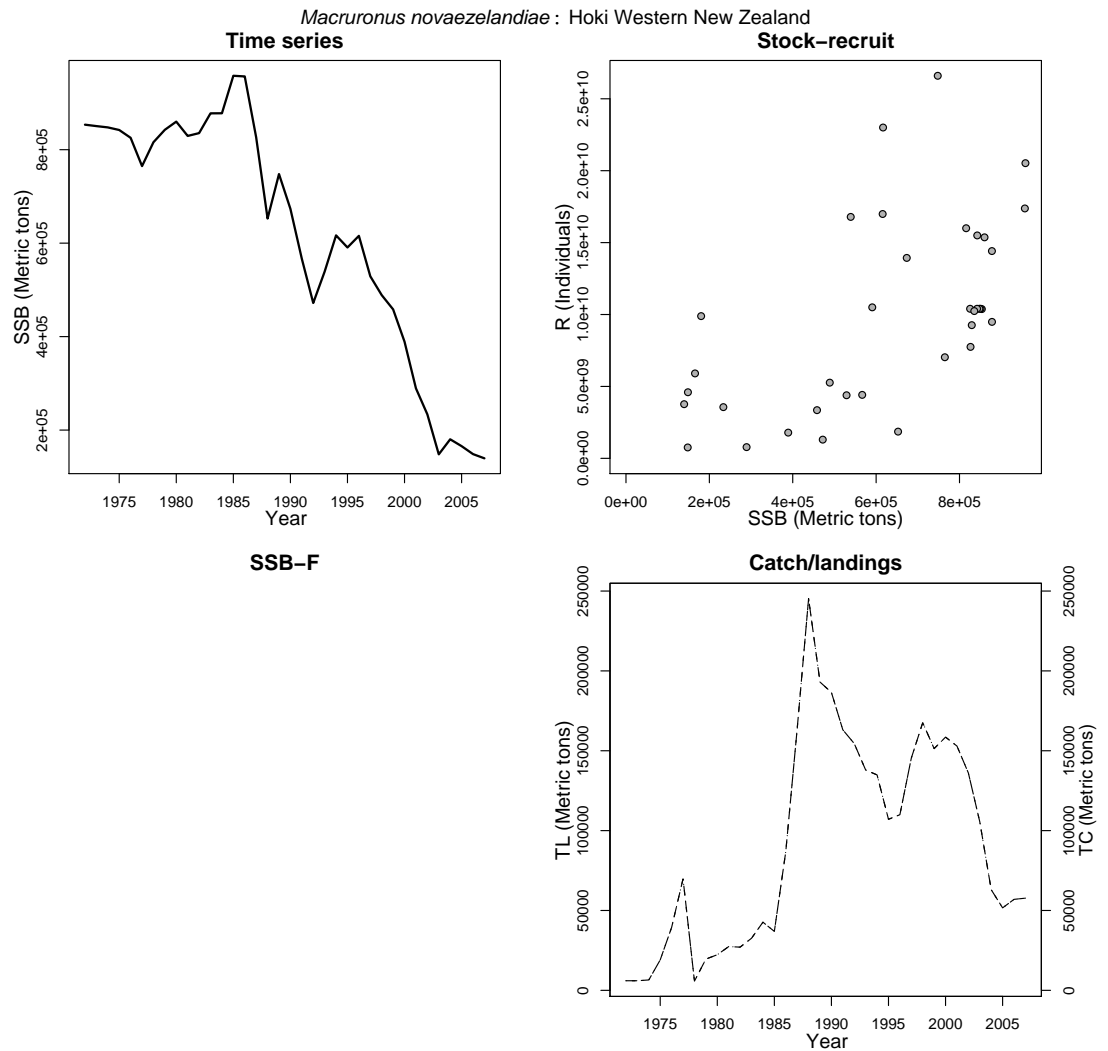


3.5.2 Merlucciidae

Macruronus novaezelandiae - Hoki



Macruronus novaezelandiae - Hoki

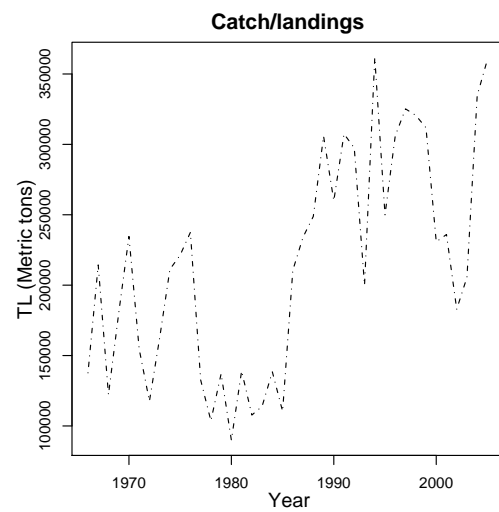


NIWA-HOKIWZ-1972-2007-FRANCIS

Merluccius productus - Pacific hake

Merluccius productus : Pacific hake Pacific Coast
Time series **Stock-recruit**

SSB-F

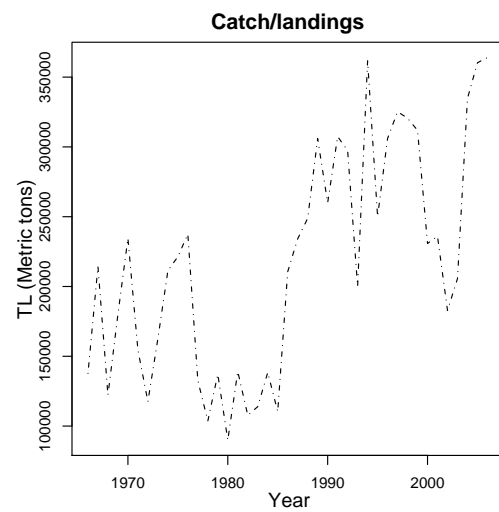


NMFS-PHAKEPCOAST-2006-FOGARTY

Merluccius productus - Pacific hake

Merluccius productus : Pacific hake Pacific Coast
Time series **Stock-recruit**

SSB-F



NMFS-PHAKEPCOAST-2007-FOGARTY

3.6 Lophiiformes

3.6.1 Lophiidae

Lophius americanus - Monkfish

Lophius americanus : Monkfish Gulf of Maine / Northern Georges Bank
Time series **Stock-recruit**

SSB-F

Catch/landings

NMFS-MONKGOMNGB-2007-FOGARTY

Lophius americanus - Monkfish

Lophius americanus : Monkfish Southern Georges Bank / Mid-Atlantic
Time series **Stock-recruit**

SSB-F

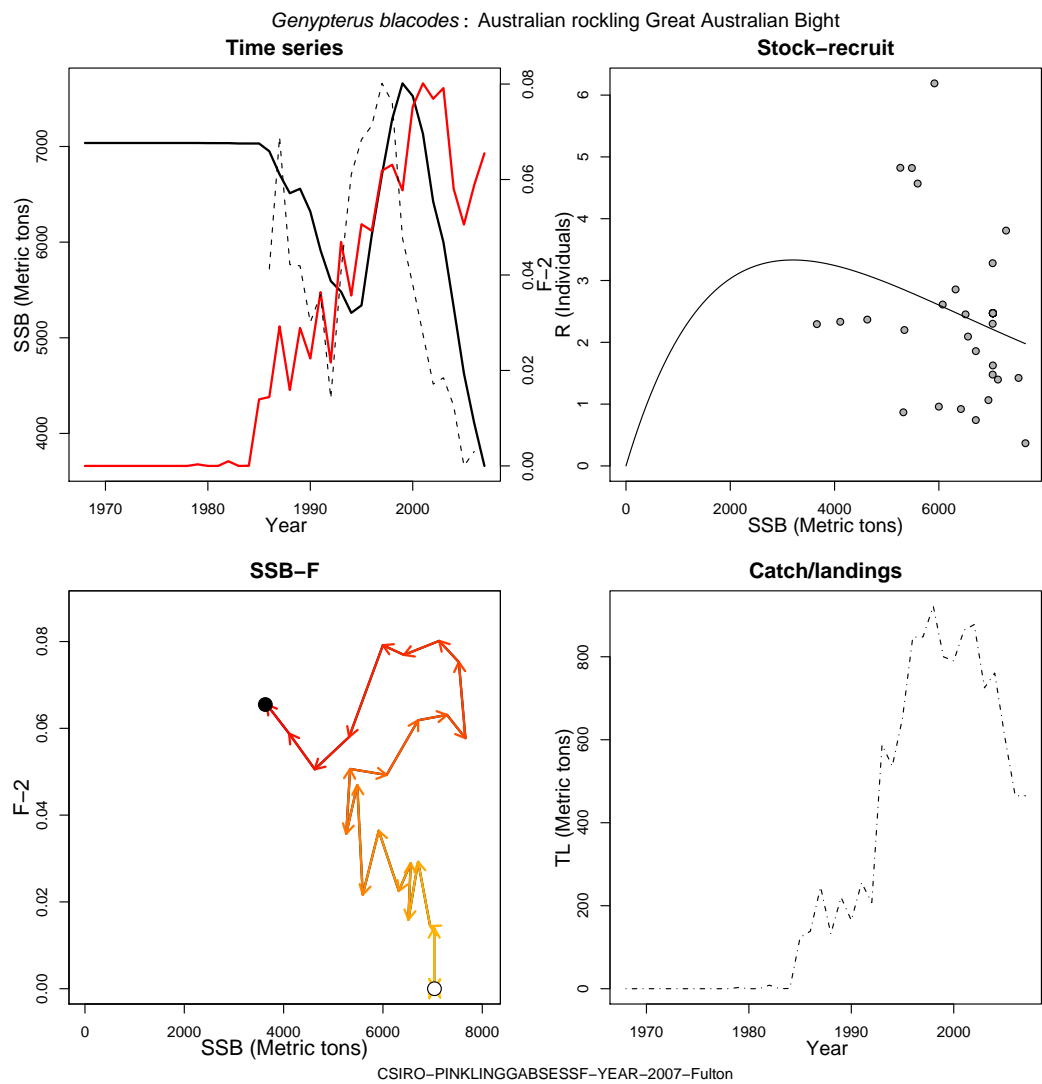
Catch/landings

NMFS-MONKSGBMATL-2007-FOGARTY

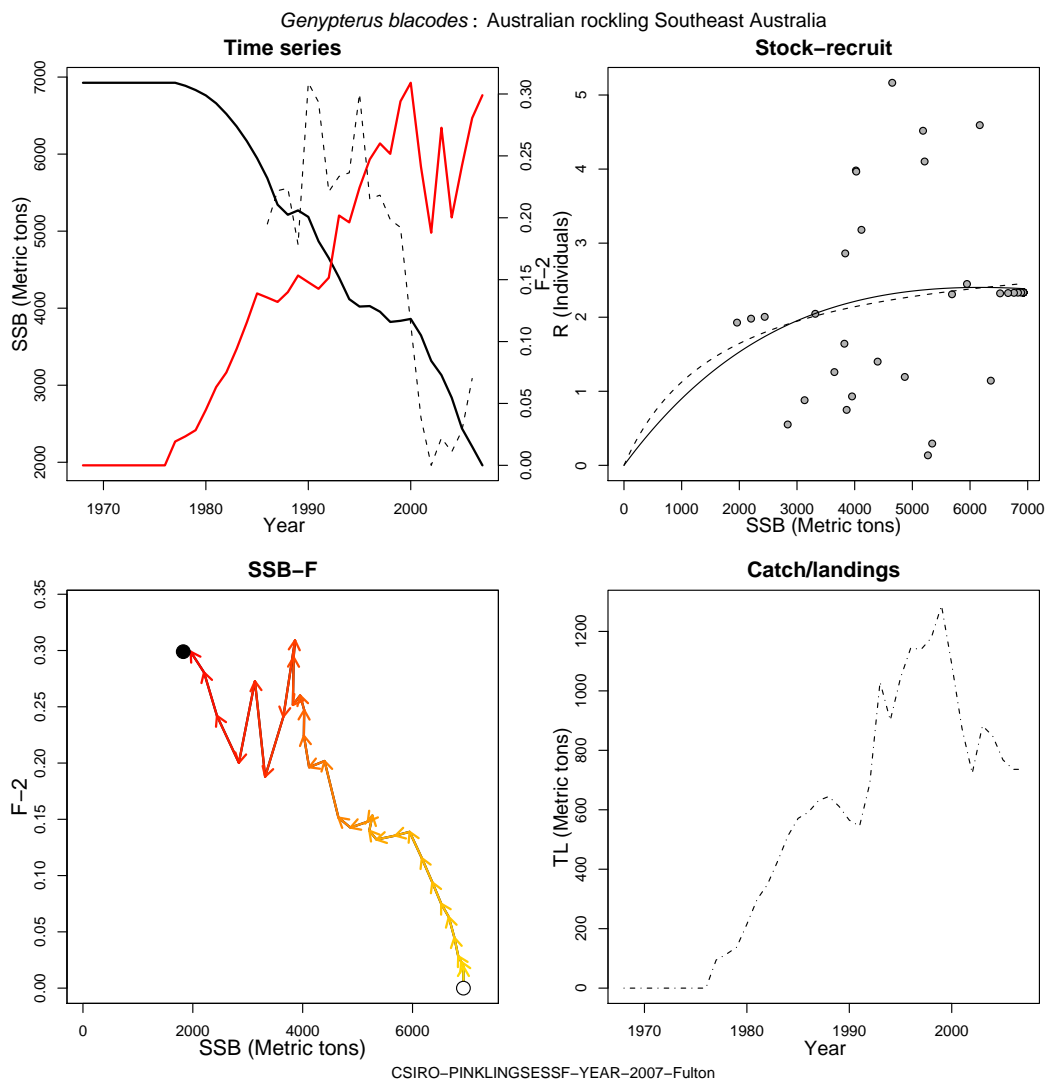
3.7 Ophidiiformes

3.7.1 Ophidiidae

Genypterus blacodes - Australian rockling



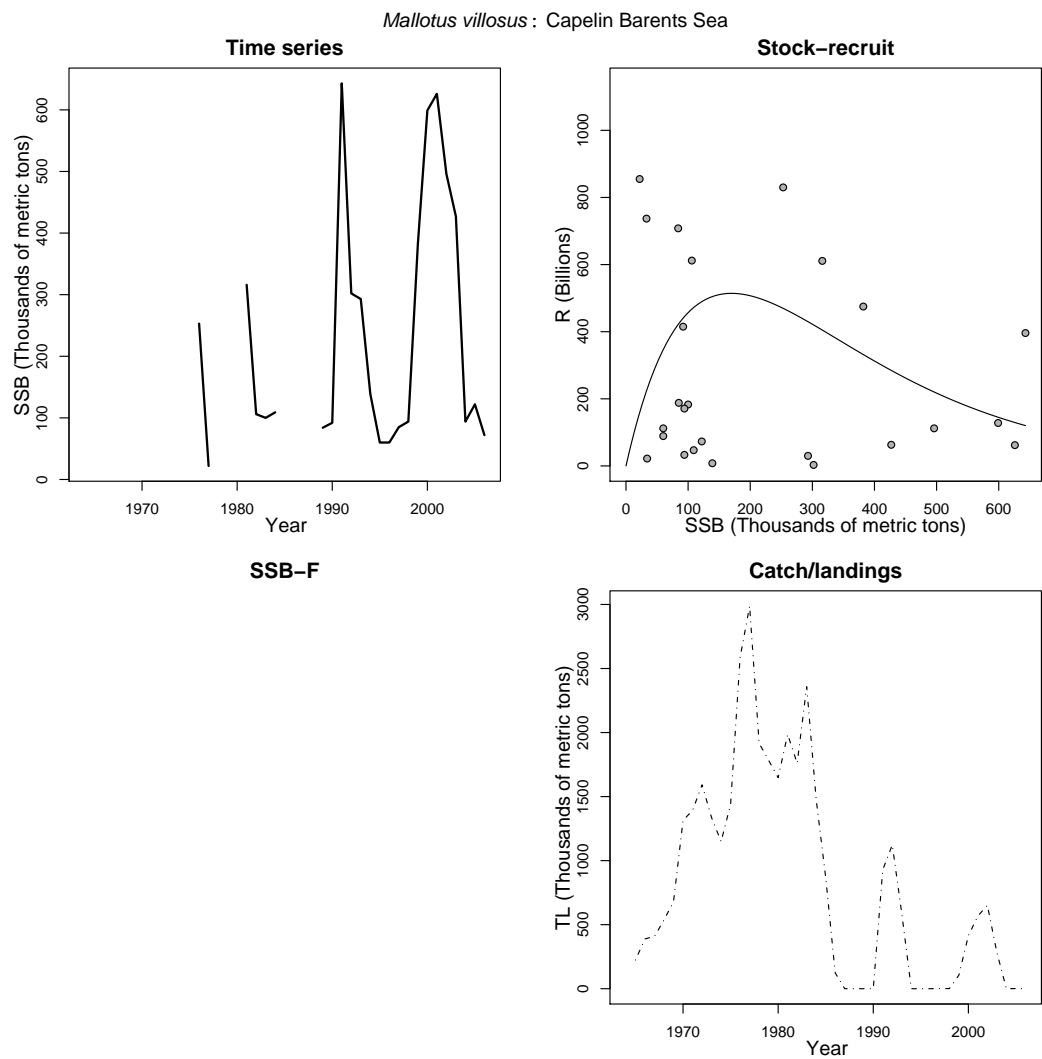
Genypterus blacodes - Australian rockling



3.8 Osmeriformes

3.8.1 Osmeridae

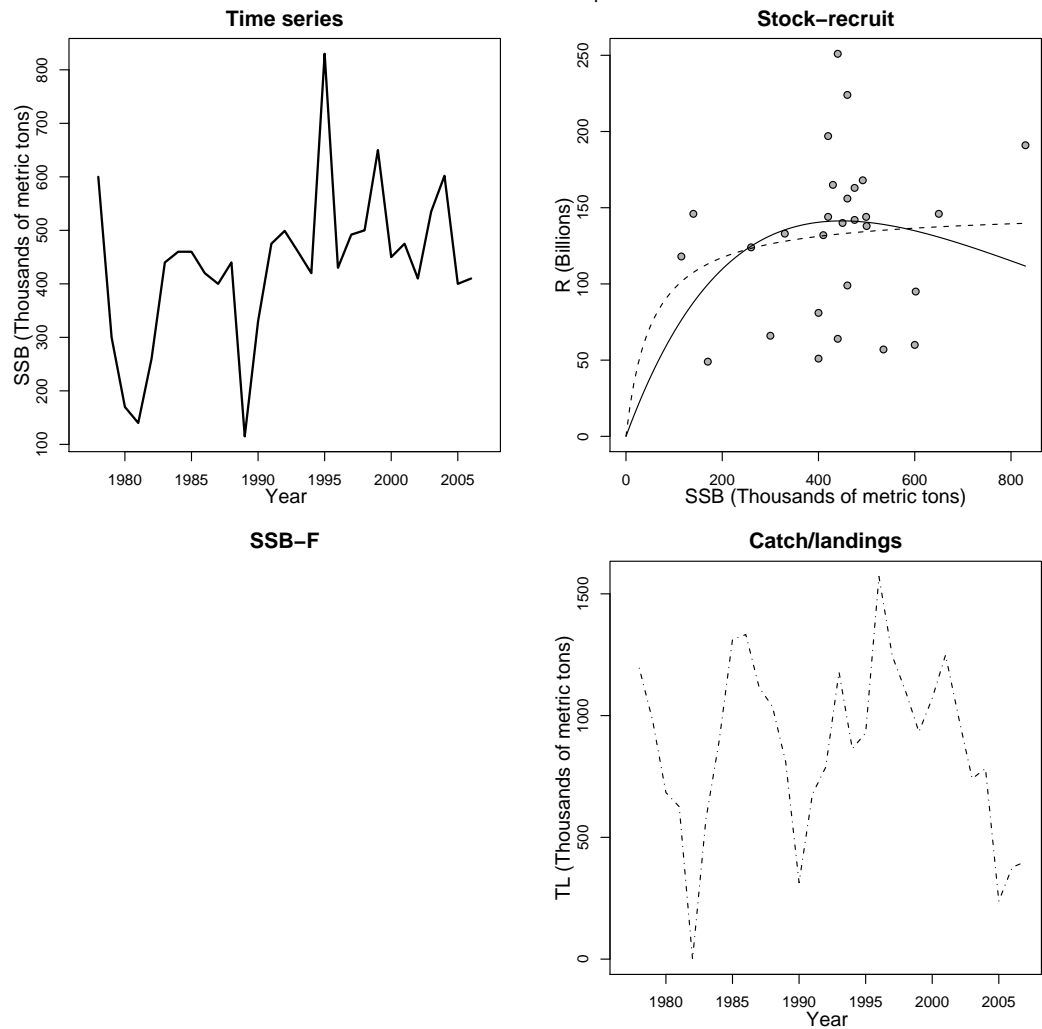
Mallotus villosus - Capelin



AFWG-CAPENOR-1964-2006-MINTO

Mallotus villosus - Capelin

Mallotus villosus : Capelin Iceland



NWWG-CAPEICE-1977-2007-MINTO

Mallotus villosus - Capelin



3.9 Ostreoida

3.9.1 Pectinidae

Placopecten magellanicus - Sea scallop

Placopecten magellanicus : Sea scallop Northwestern Atlantic Coast
Time series **Stock-recruit**

SSB-F

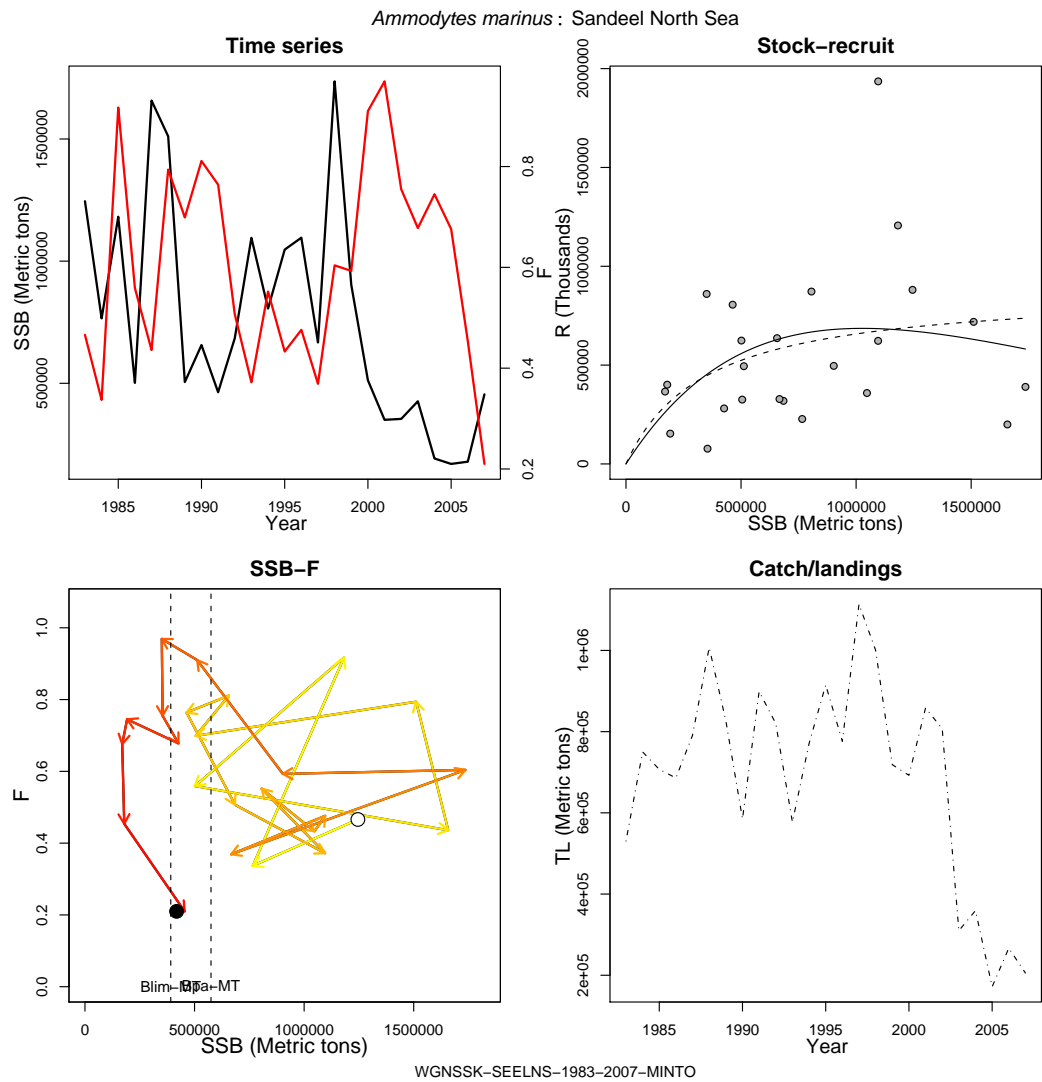
Catch/landings

NMFS-SCALLNWATLC-2007-FOGARTY

3.10 Perciformes

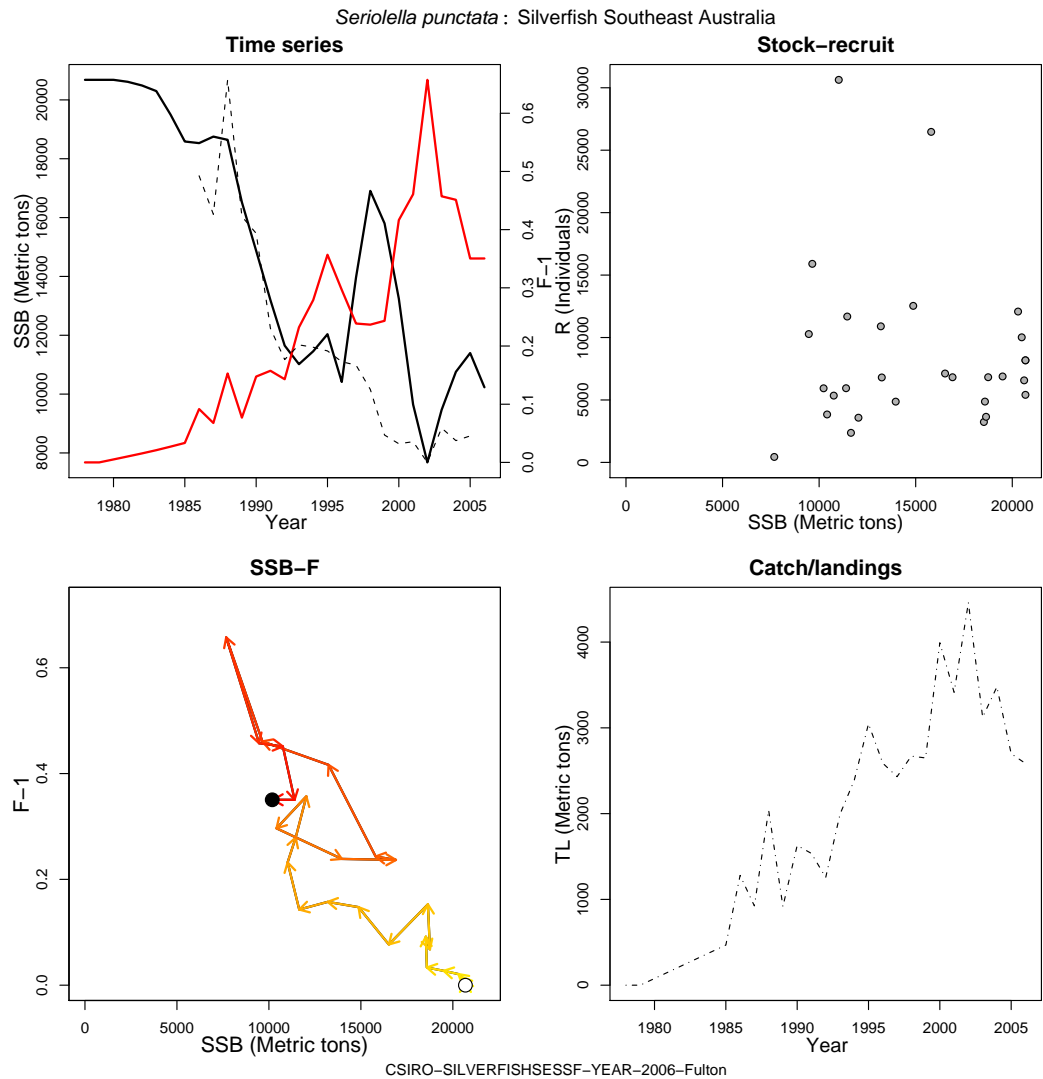
3.10.1 Ammodytidae

Ammodytes marinus - Sand eel



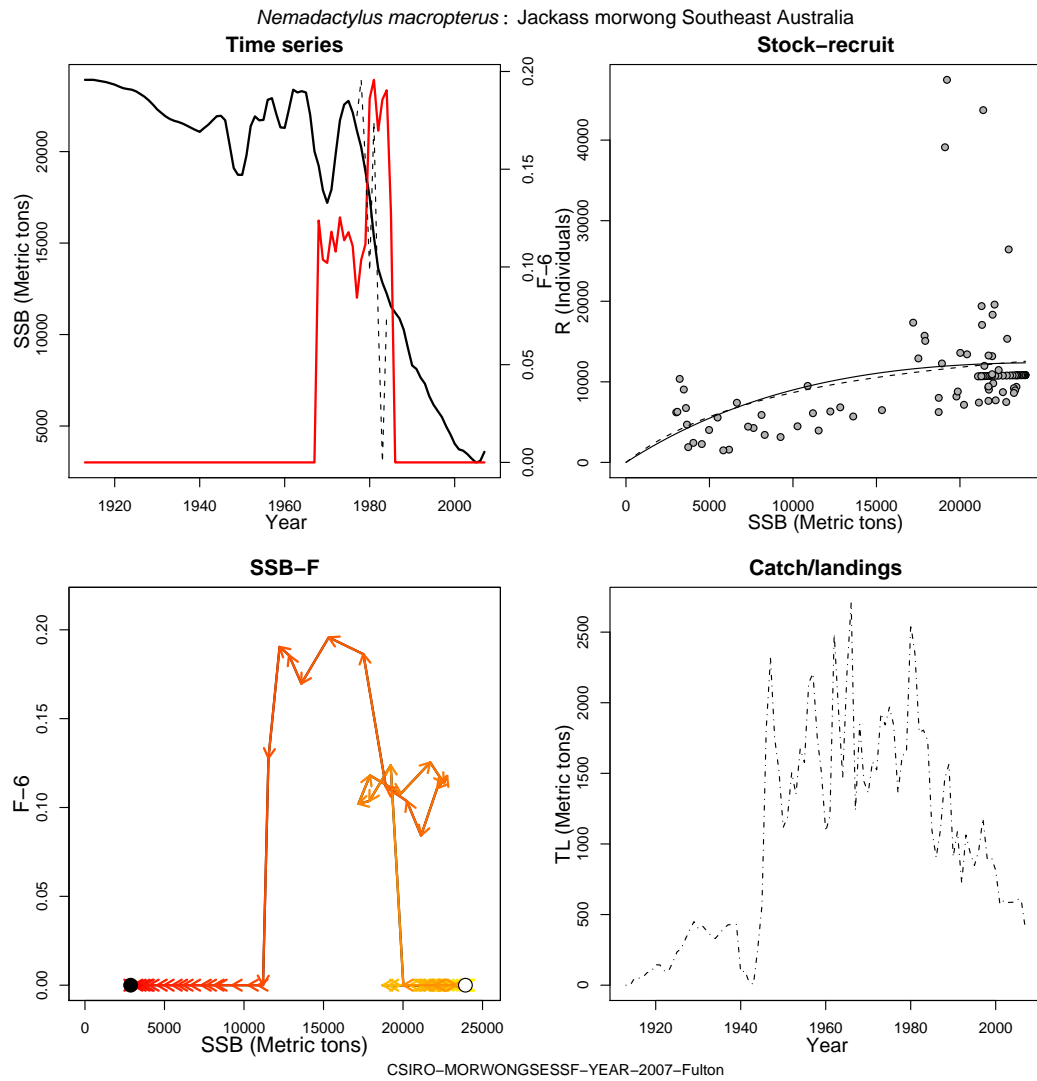
3.10.2 Centrolophidae

Seriolaella punctata - Silverfish



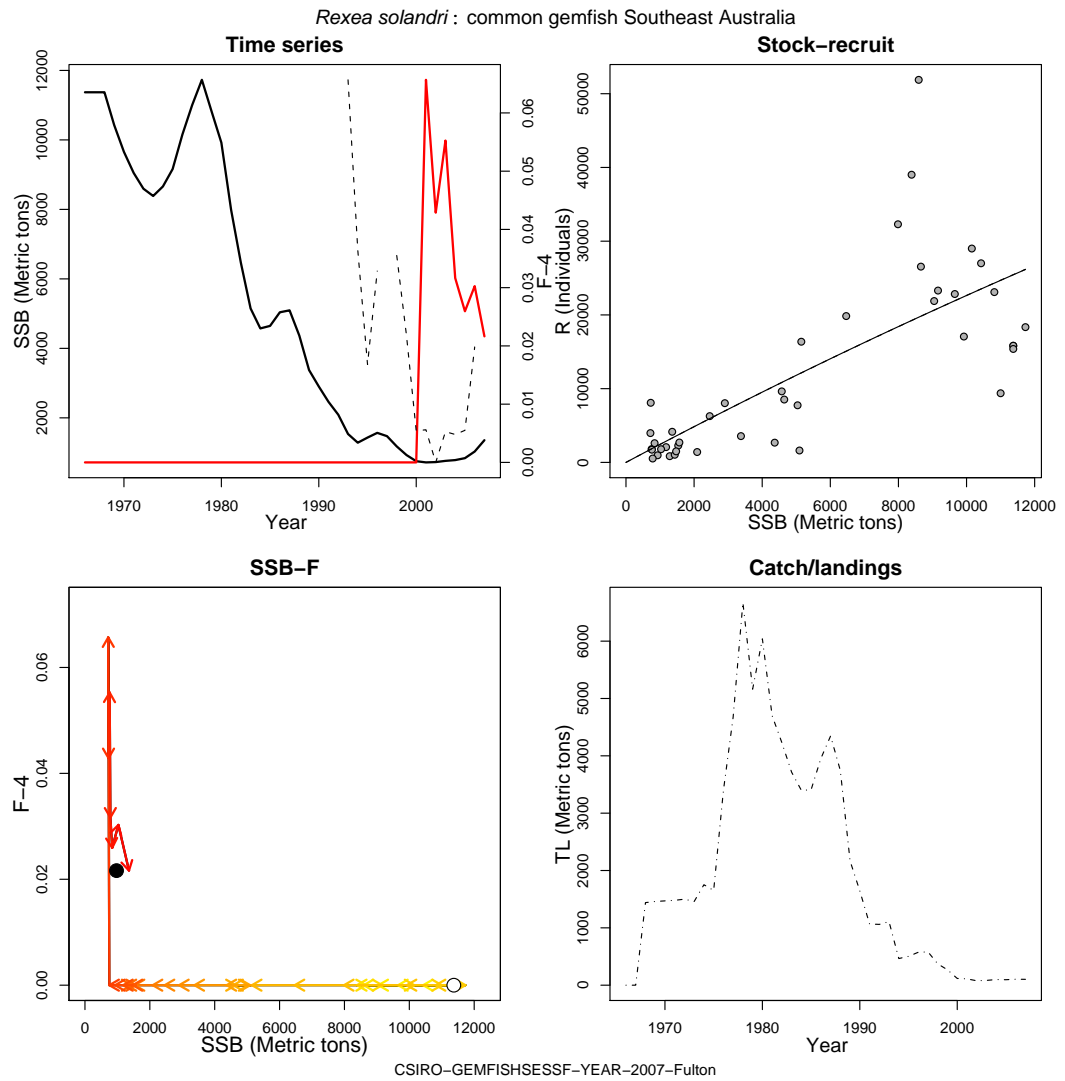
3.10.3 Cheilodactylidae

Nemadactylus macropterus - Hawaiian morwong



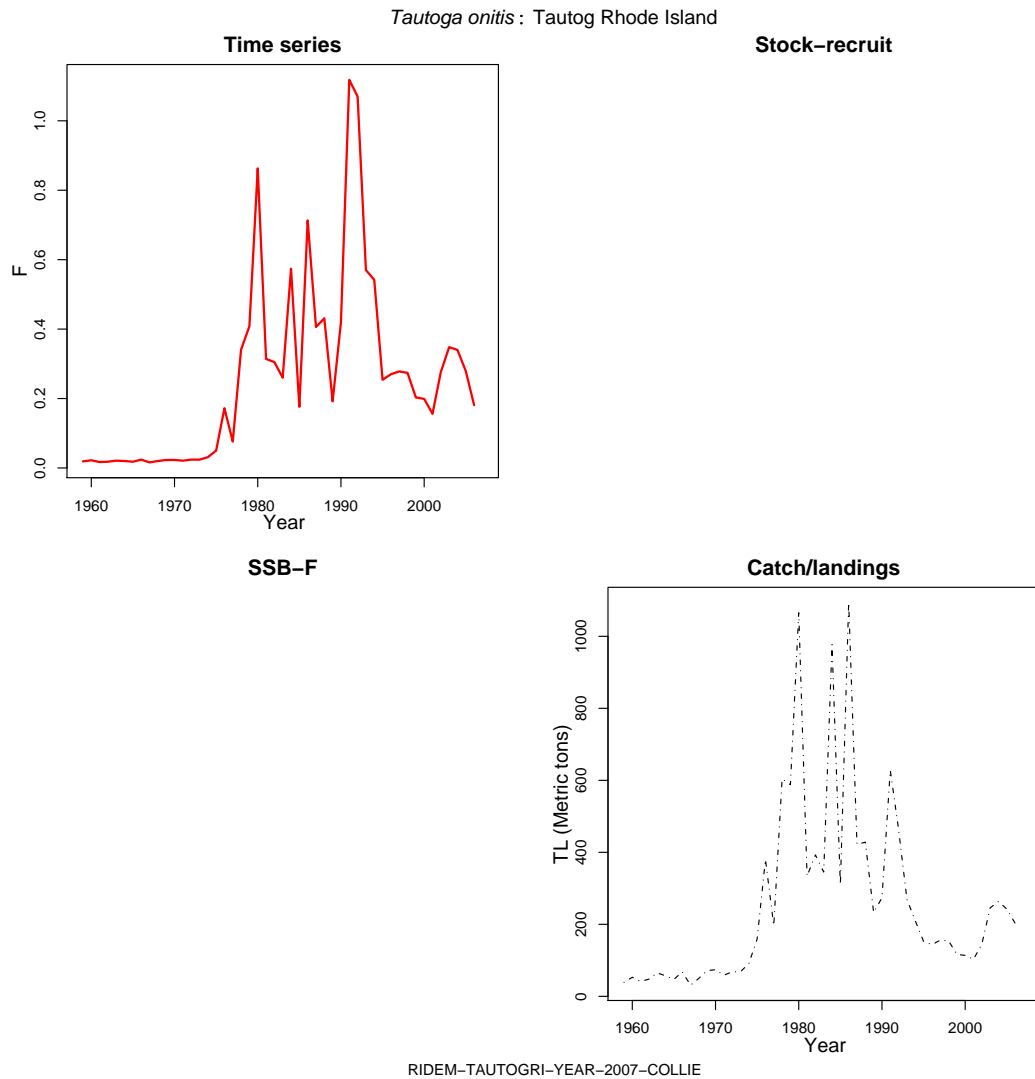
3.10.4 Gempylidae

Rexea solandri - common gemfish



3.10.5 Labridae

Tautoga onitis - Tautog



3.10.6 Lutjanidae

Lutjanus campechanus - Red snapper

Lutjanus campechanus : Red snapper Eastern Gulf of Mexico
Time series **Stock-recruit**

SSB-F

Catch/landings

NMFS-RSNAPEGM-2006-FOGARTY

Lutjanus campechanus - Red snapper

Lutjanus campechanus : Red snapper Western Gulf of Mexico
Time series **Stock-recruit**

SSB-F

Catch/landings

NMFS-RSNAPWGM-2006-FOGARTY

Rhomboplites aurorubens - Vermilion snapper

Rhomboplites aurorubens : Vermilion snapper Gulf of Mexico
Time series **Stock-recruit**

SSB-F

Catch/landings

NMFS-VSNAPGM-2006-FOGARTY

3.10.7 Moronidae

Morone saxatilis - Striped bass

Morone saxatilis : Striped bass Gulf of Maine / Cape Hatteras
Time series **Stock-recruit**

SSB-F

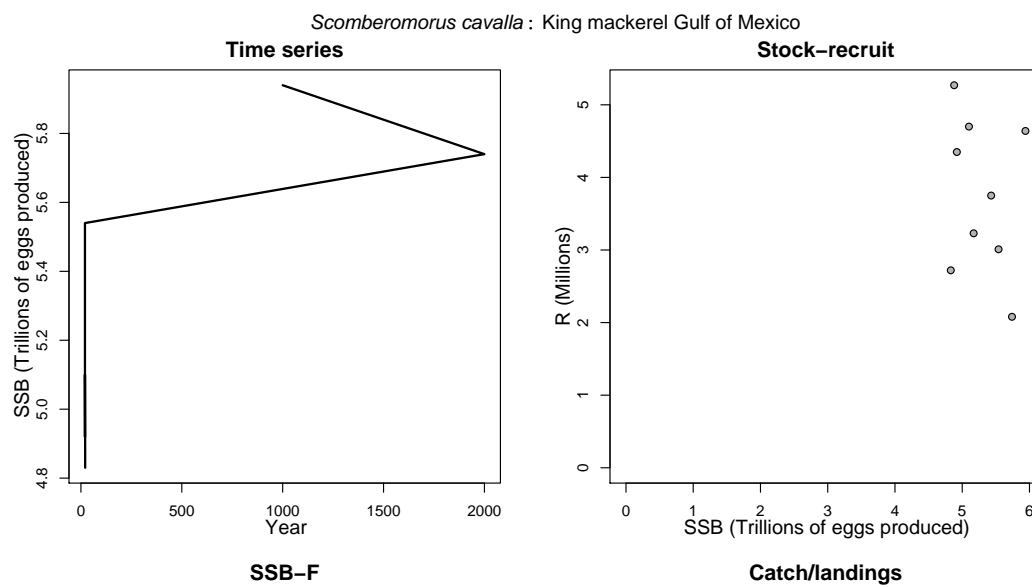
Catch/landings

NMFS-STRIPEDBASSGOMCHATT-2008-FOGARTY

3.10.8 Pomatomidae

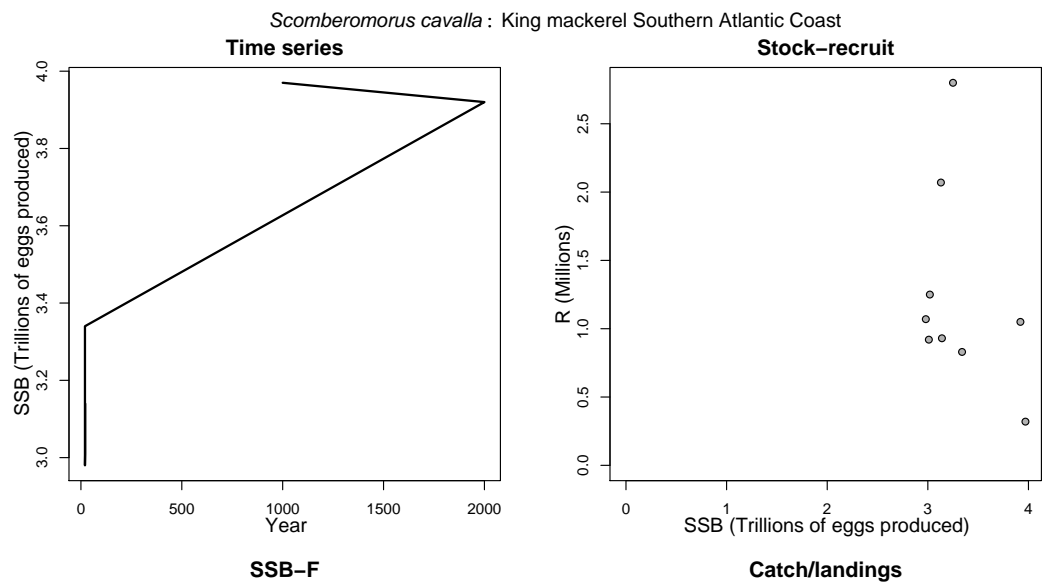
3.10.9 Scombridae

Scomberomorus cavalla - King Mackerel



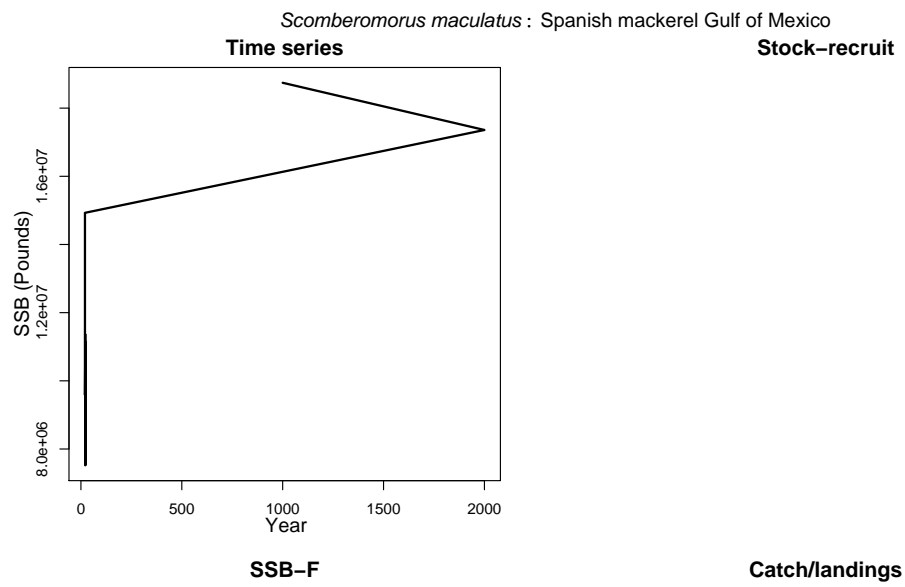
NMFS-KMACKGM-2004-FOGARTY

Scomberomorus cavalla - King Mackerel



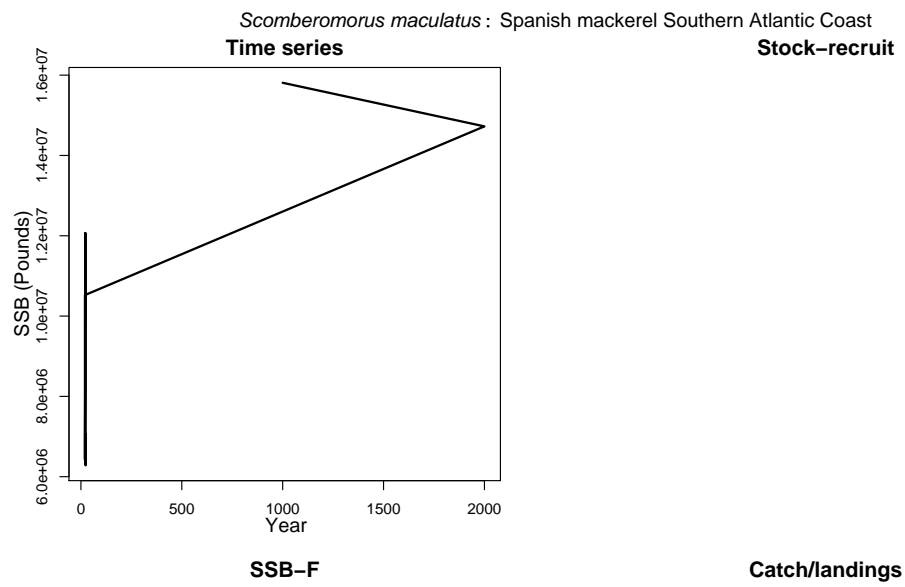
NMFS-KMACKSATLC-2004-FOGARTY

Scomberomorus maculatus - Spanish mackerel



NMFS-SPANMACKGM-2003-FOGARTY

Scomberomorus maculatus - Spanish mackerel



NMFS-SPANMACKSATLC-2003-FOGARTY

Scomber scombrus - Mackerel

Scomber scombrus : Atlantic mackerel Gulf of Maine / Cape Hatteras
Time series **Stock-recruit**

SSB-F

Catch/landings

NMFS-MACKGOMCHATT-2006-FOGARTY

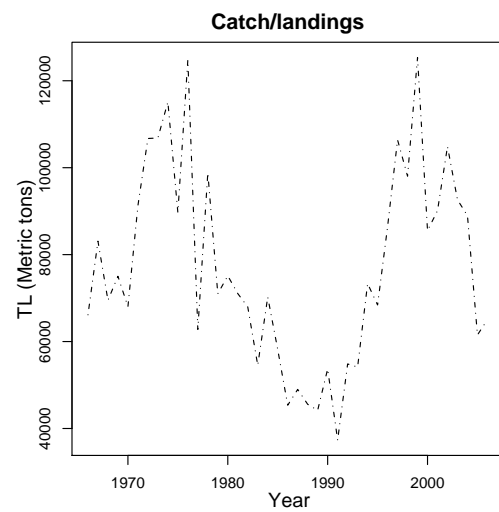
Thunnus alalunga - Albacore tuna

Thunnus alalunga : Albacore tuna North Pacific

Time series

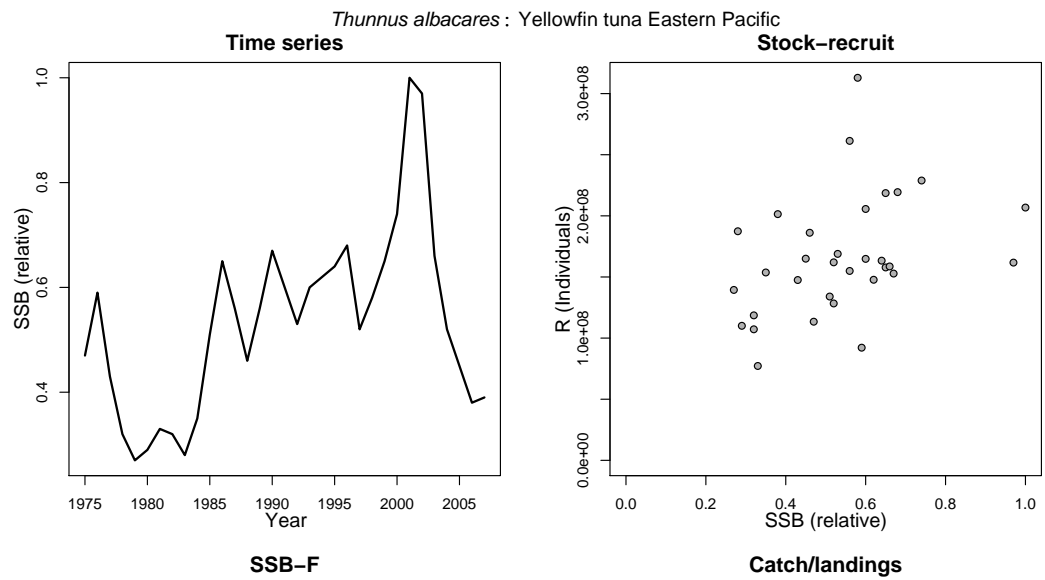
Stock-recruit

SSB-F



NMFS-ALBANPAC-2006-FOGARTY

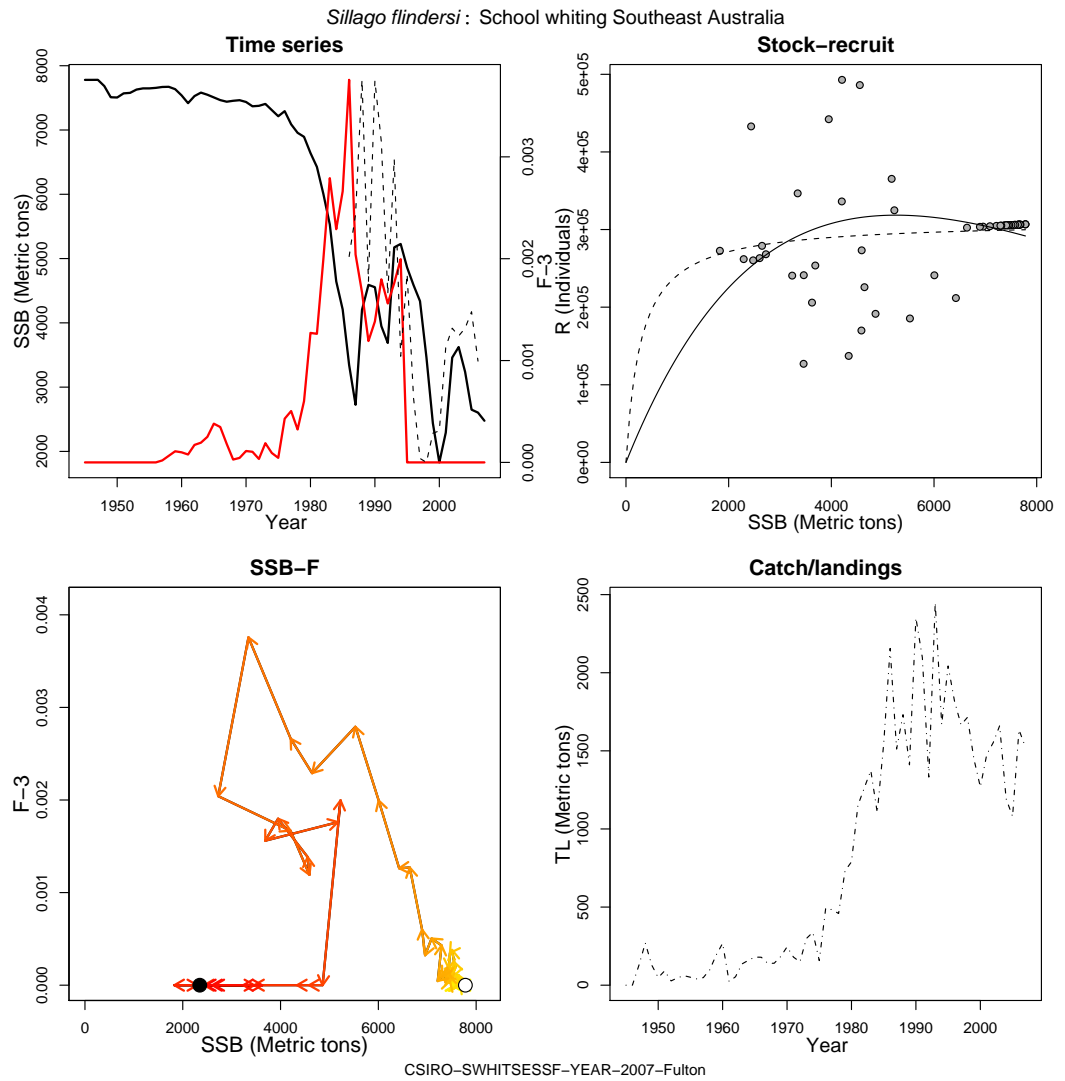
Thunnus albacares - Yellowfin tuna



IATTC-YFINEPAC-1975-2007-JENSEN

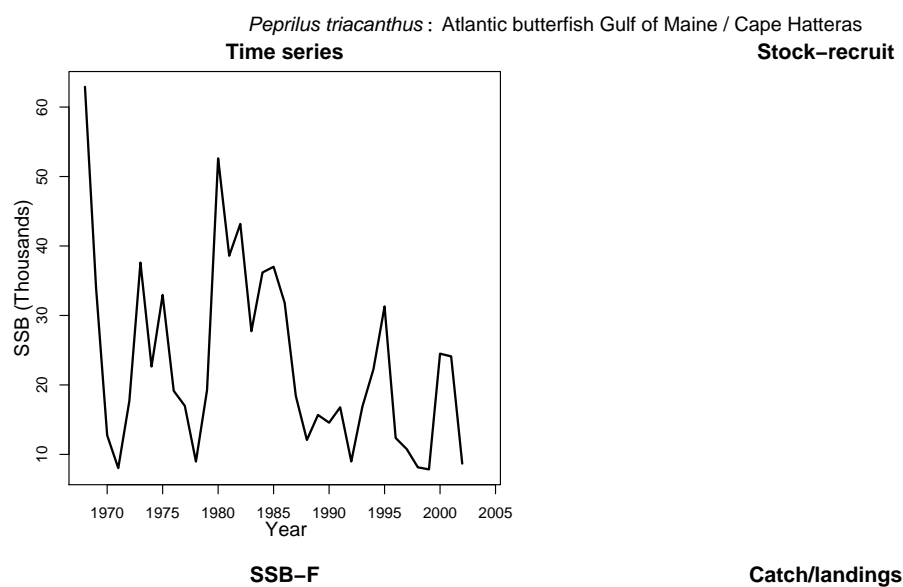
3.10.10 Sillaginidae

Sillago flindersi - School whiting



3.10.11 Stromateidae

Peprilus triacanthus - Atlantic butterfish

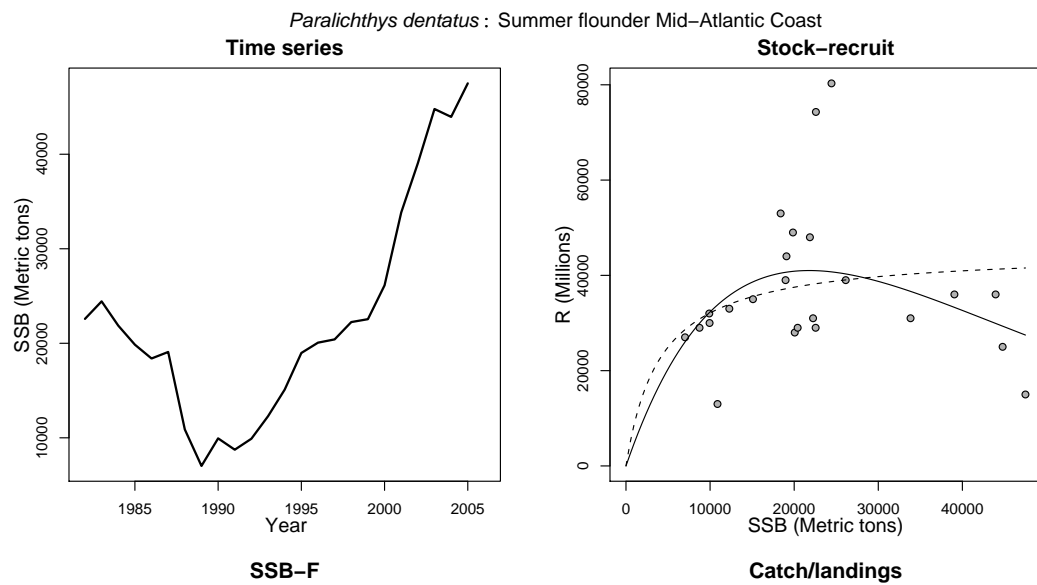


NMFS-BUTTERGOMCHATT-2004-FOGARTY

3.11 Pleuronectiformes

3.11.1 Paralichthyidae

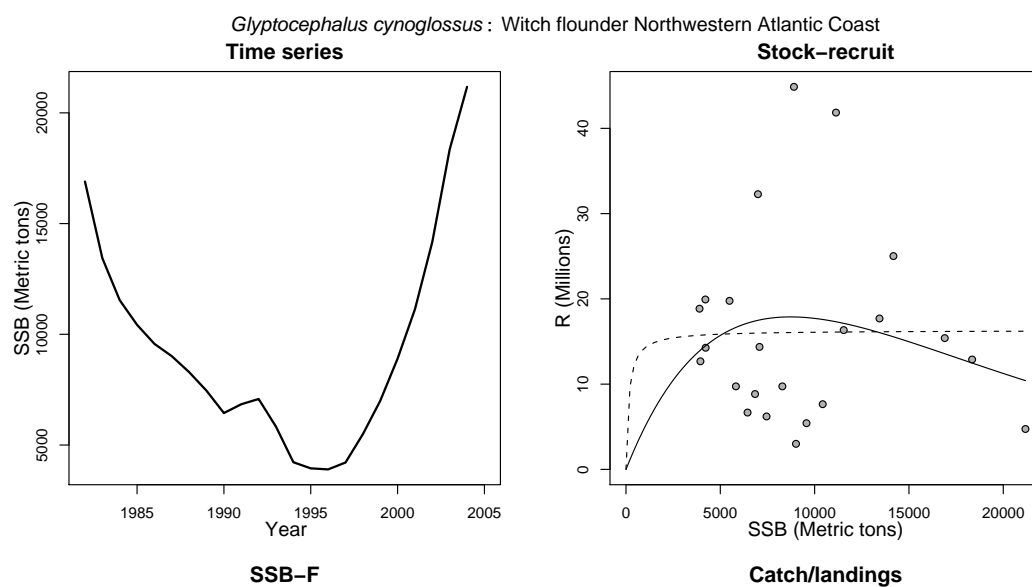
Paralichthys dentatus - Summer flounder



NMFS-SFLOUNMATLC-2006-FOGARTY

3.11.2 Pleuronectidae

Glyptocephalus cynoglossus - Witch flounder

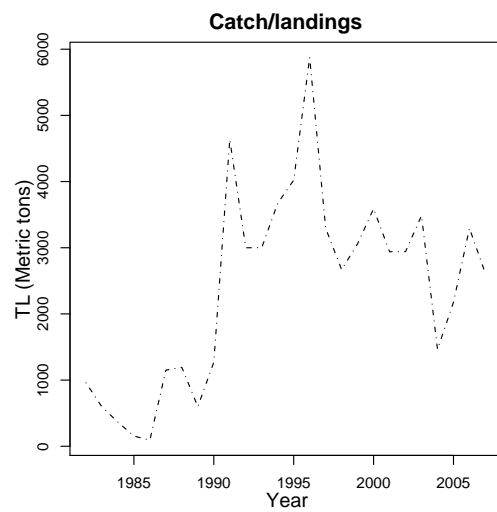


NMFS-WITFLOUNNWATLC-2005-FOGARTY

Glyptocephalus zachirus - Rex sole

Glyptocephalus zachirus : Rex sole Gulf of Alaska
Time series **Stock-recruit**

SSB-F

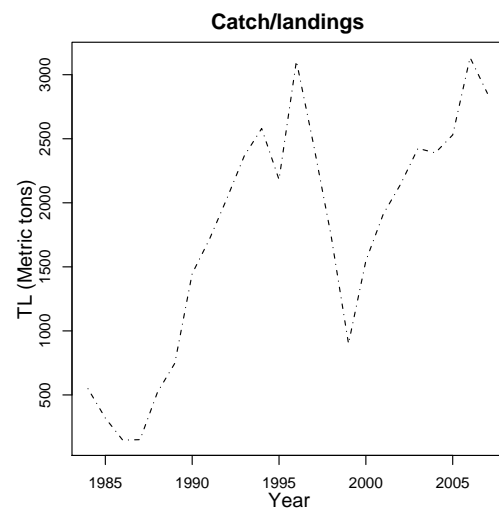


NMFS-REXSOLEGA-2007-FOGARTY

Hippoglossoides elassodon - Flathead sole

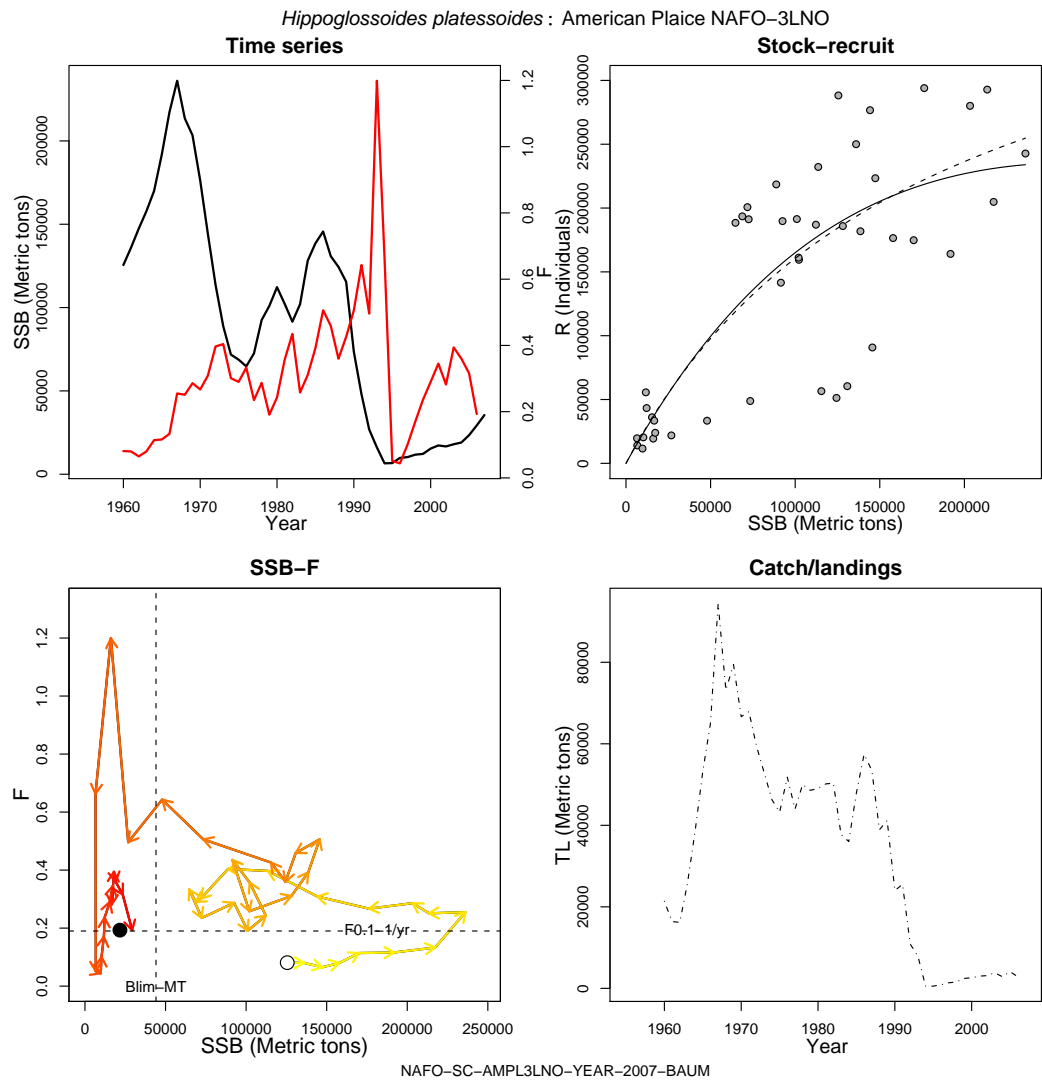
Hippoglossoides elassodon : Flathead sole Gulf of Alaska
Time series **Stock-recruit**

SSB-F

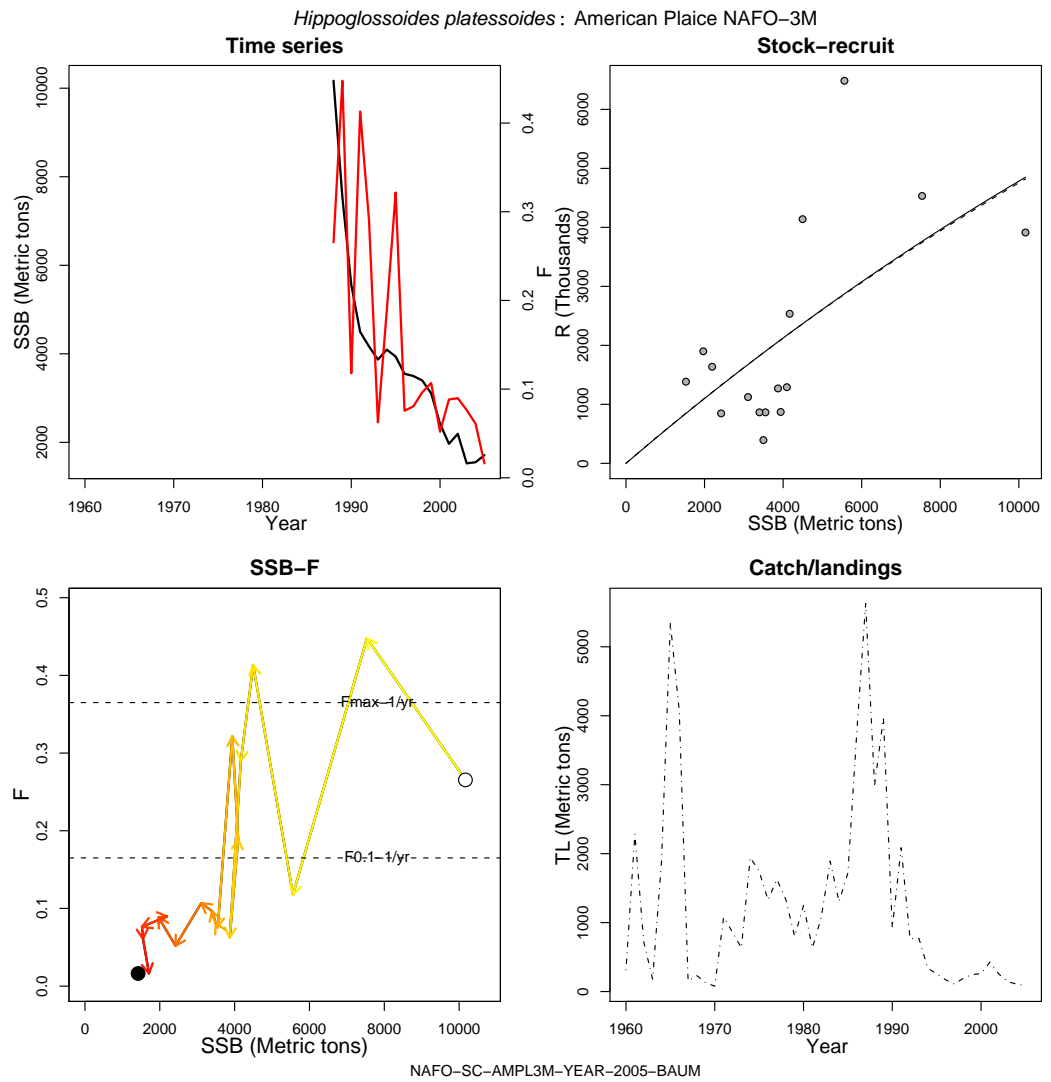


NMFS-FLSOLEGA-2007-FOGARTY

Hippoglossoides platessoides - American plaice

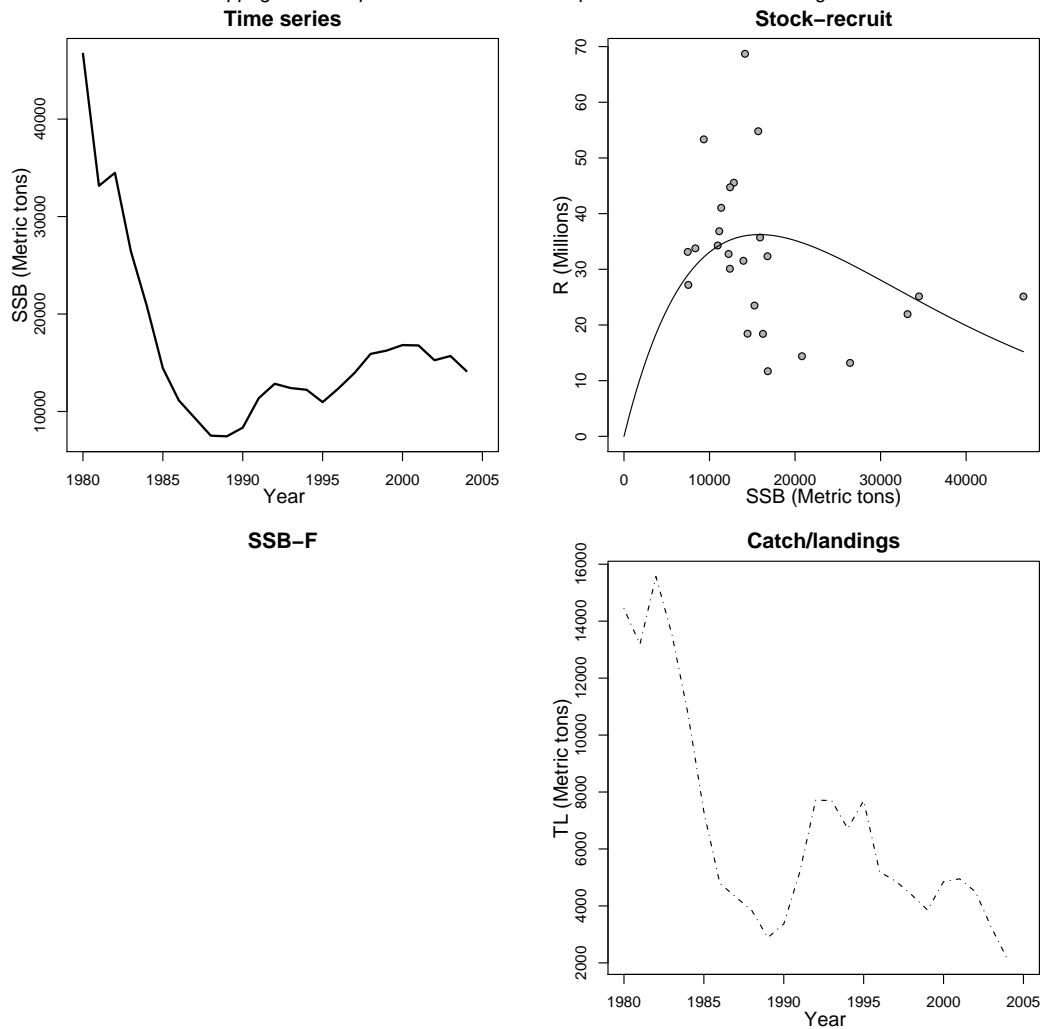


Hippoglossoides platessoides - American plaice



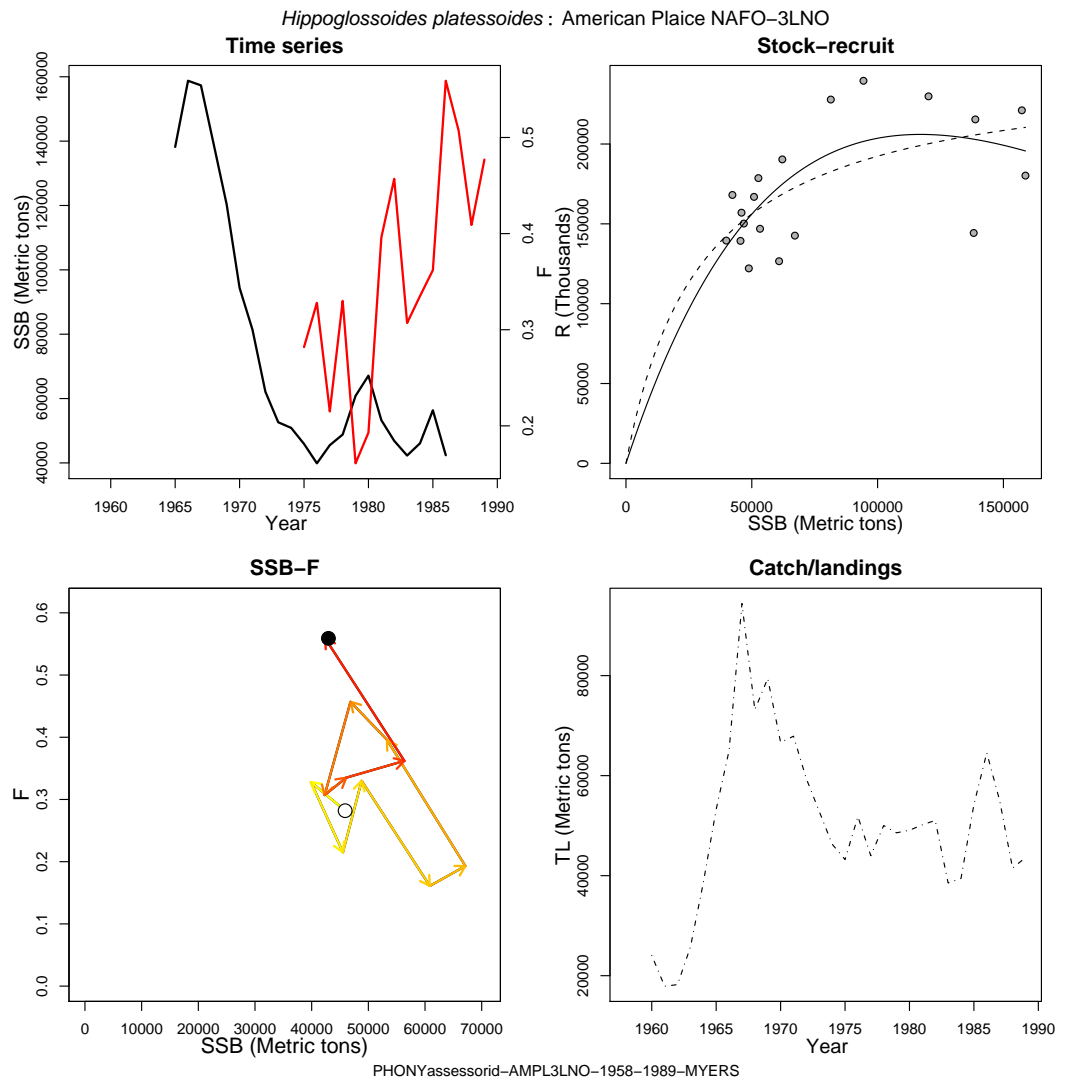
Hippoglossoides platessoides - American plaice

Hippoglossoides platessoides : American plaice Gulf of Maine / Georges Bank



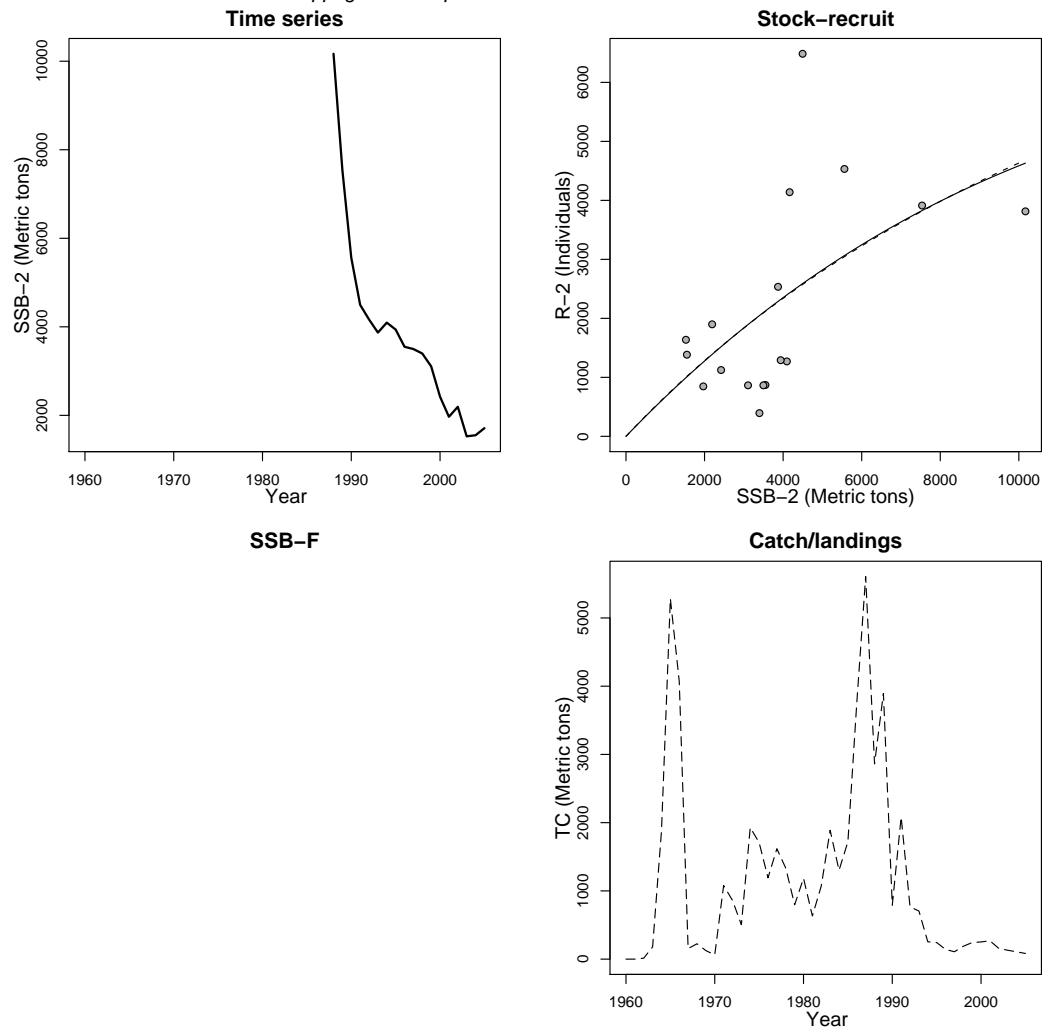
NMFS-AMPLGOMGB-2005-FOGARTY

Hippoglossoides platessoides - American plaice



Hippoglossoides platessoides - American plaice

Hippoglossoides platessoides : American Plaice NAFO-3M

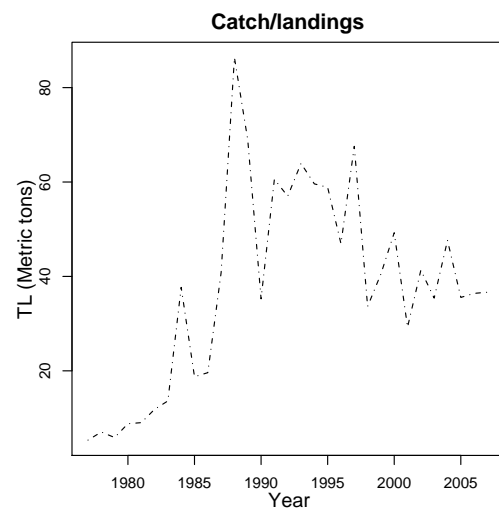


NAFO-SC-AMPL3M-1960-2005-PREFONTAINE

Lepidopsetta polyxystra - Northern rock sole

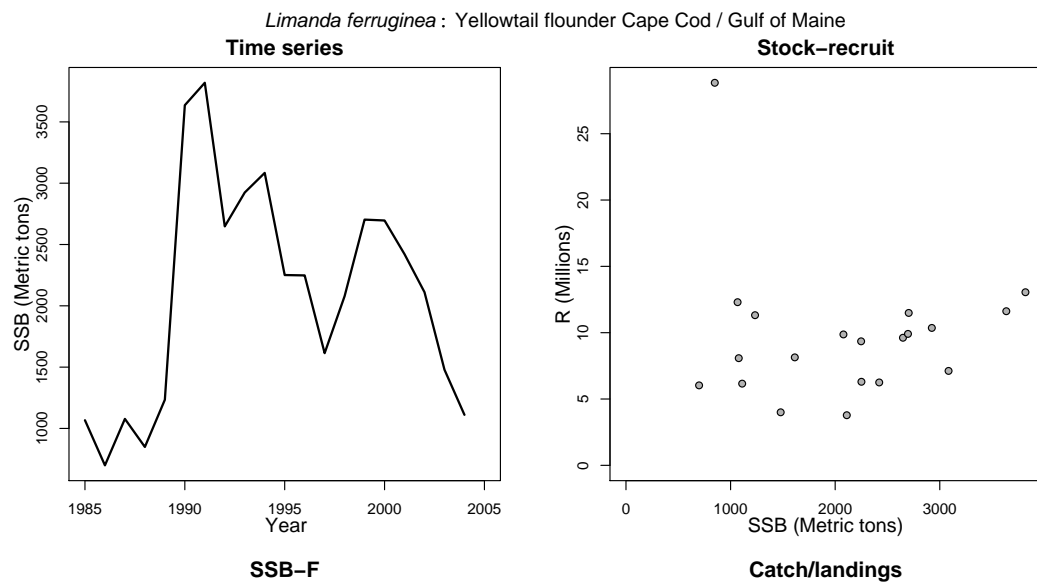
Lepidopsetta polyxystra : Northern rock sole Eastern Bering Sea and Aleutian Islands
Time series **Stock-recruit**

SSB-F



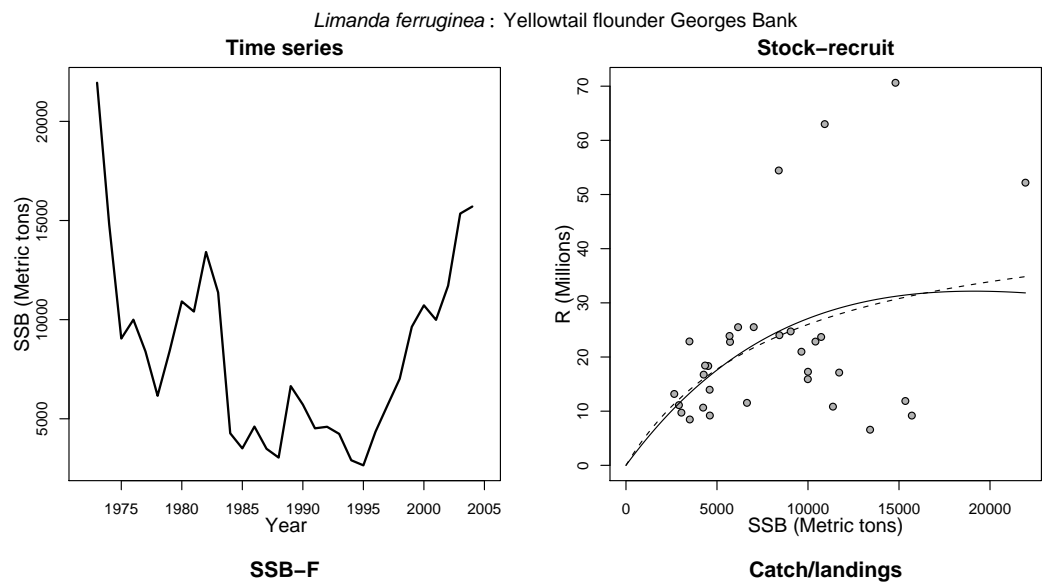
NMFS-NRSOLEEBSAI-2007-FOGARTY

Limanda ferruginea - Yellowtail flounder



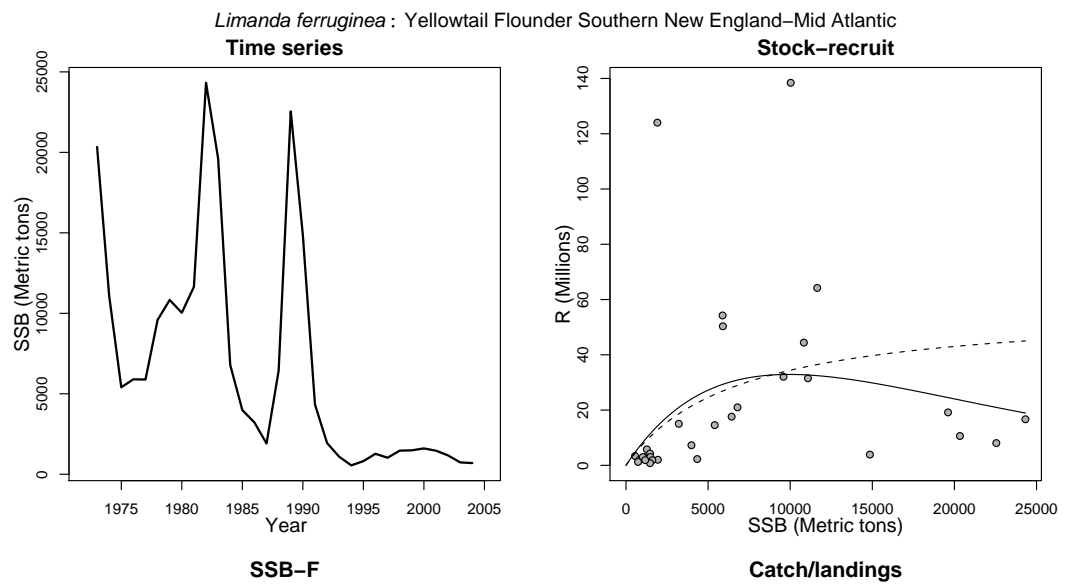
NMFS-YELLCCODGOM-2005-FOGARTY

Limanda ferruginea - Yellowtail flounder



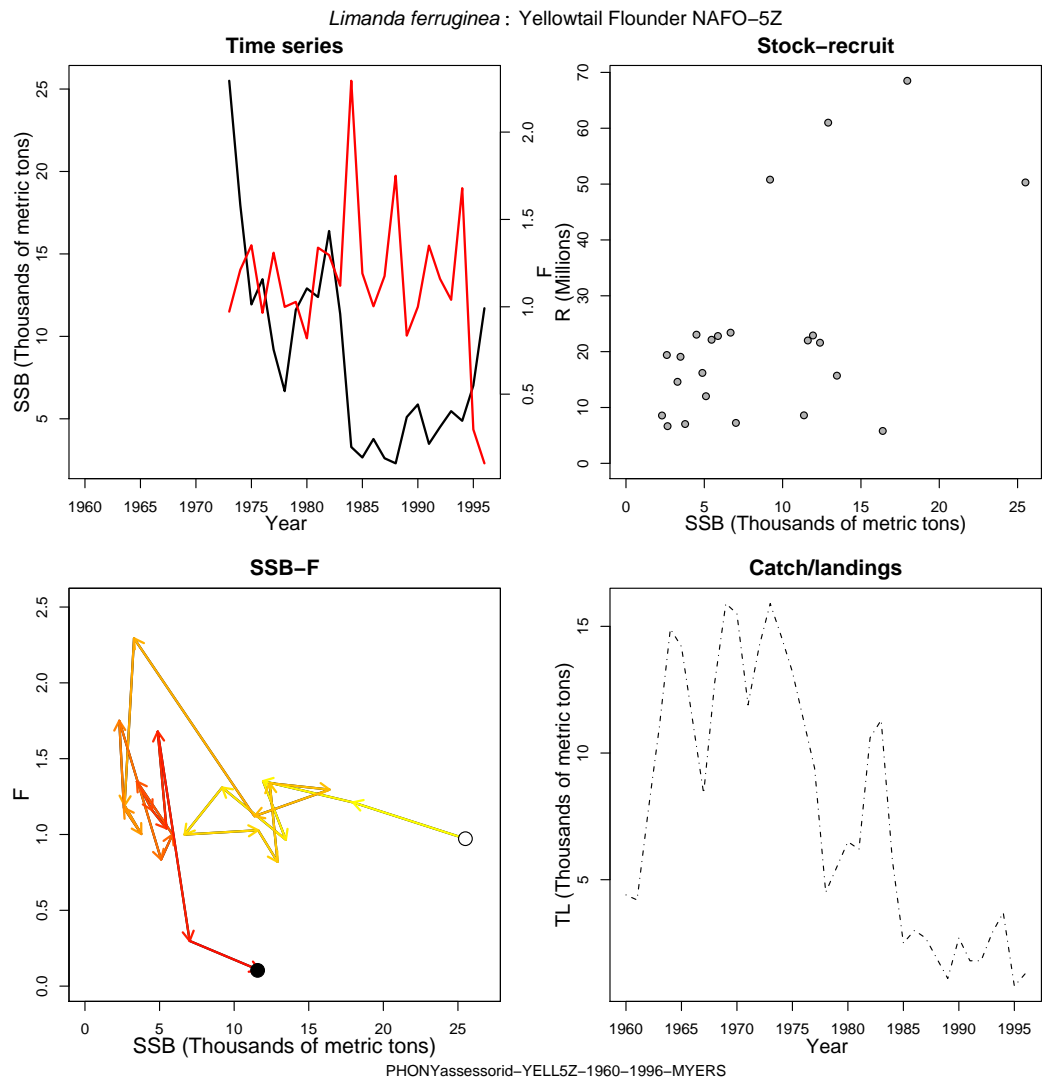
NMFS-YELLGB-2005-FOGARTY

Limanda ferruginea - Yellowtail flounder



NMFS-YELLSNEMATL-2005-FOGARTY

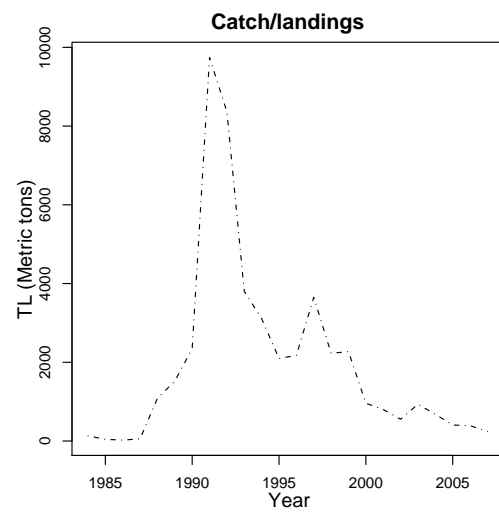
Limanda ferruginea - Yellowtail flounder



Microstomus pacificus - Dover sole

Microstomus pacificus : Dover sole Gulf of Alaska
Time series **Stock-recruit**

SSB-F



NMFS-DSOLEGA-2007-FOGARTY

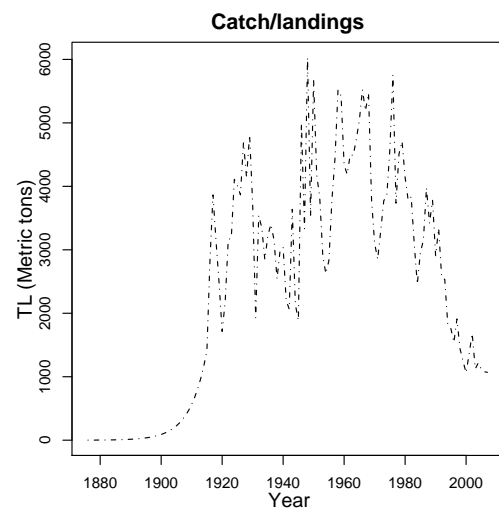
Parophrys vetulus - English sole

Parophrys vetulus : English sole Pacific Coast

Time series

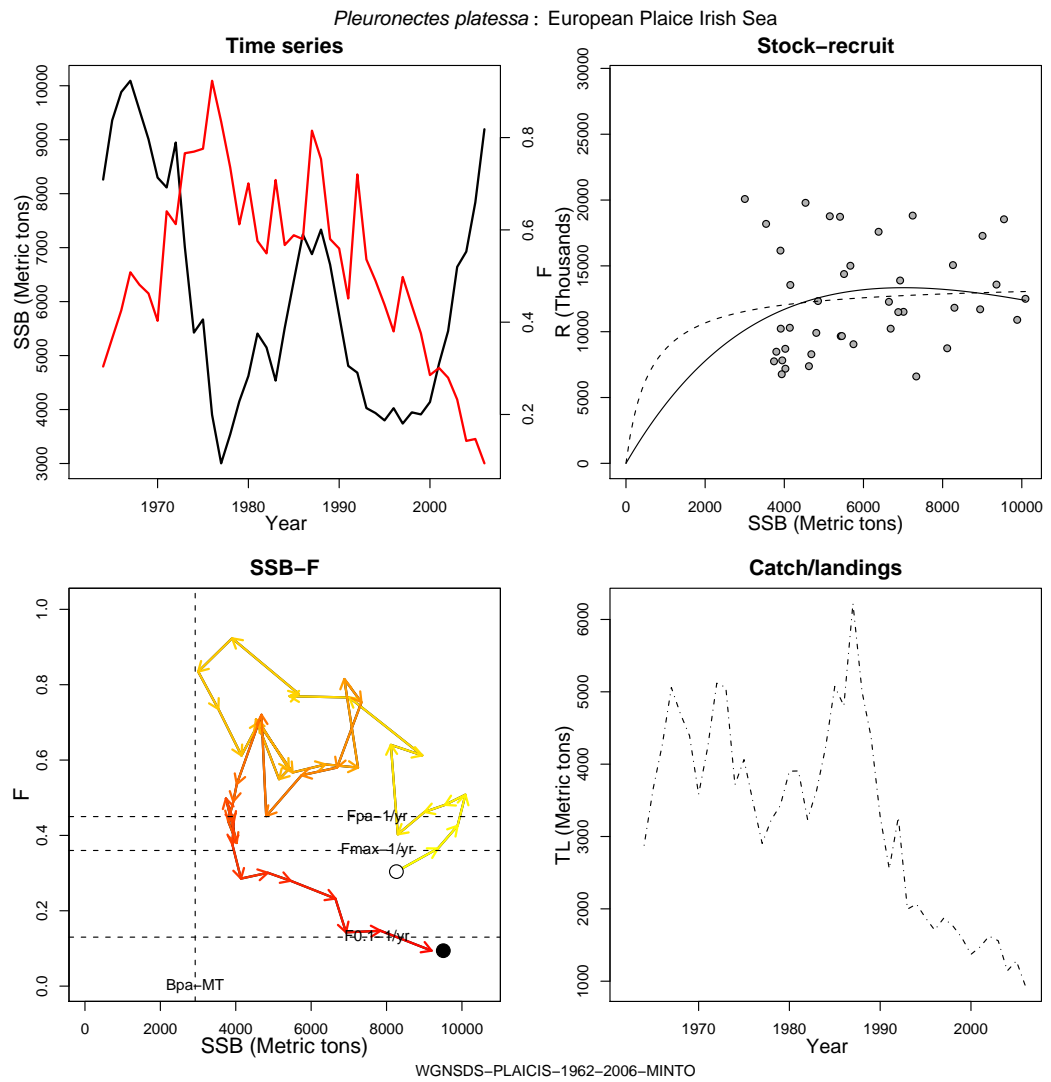
Stock-recruit

SSB-F

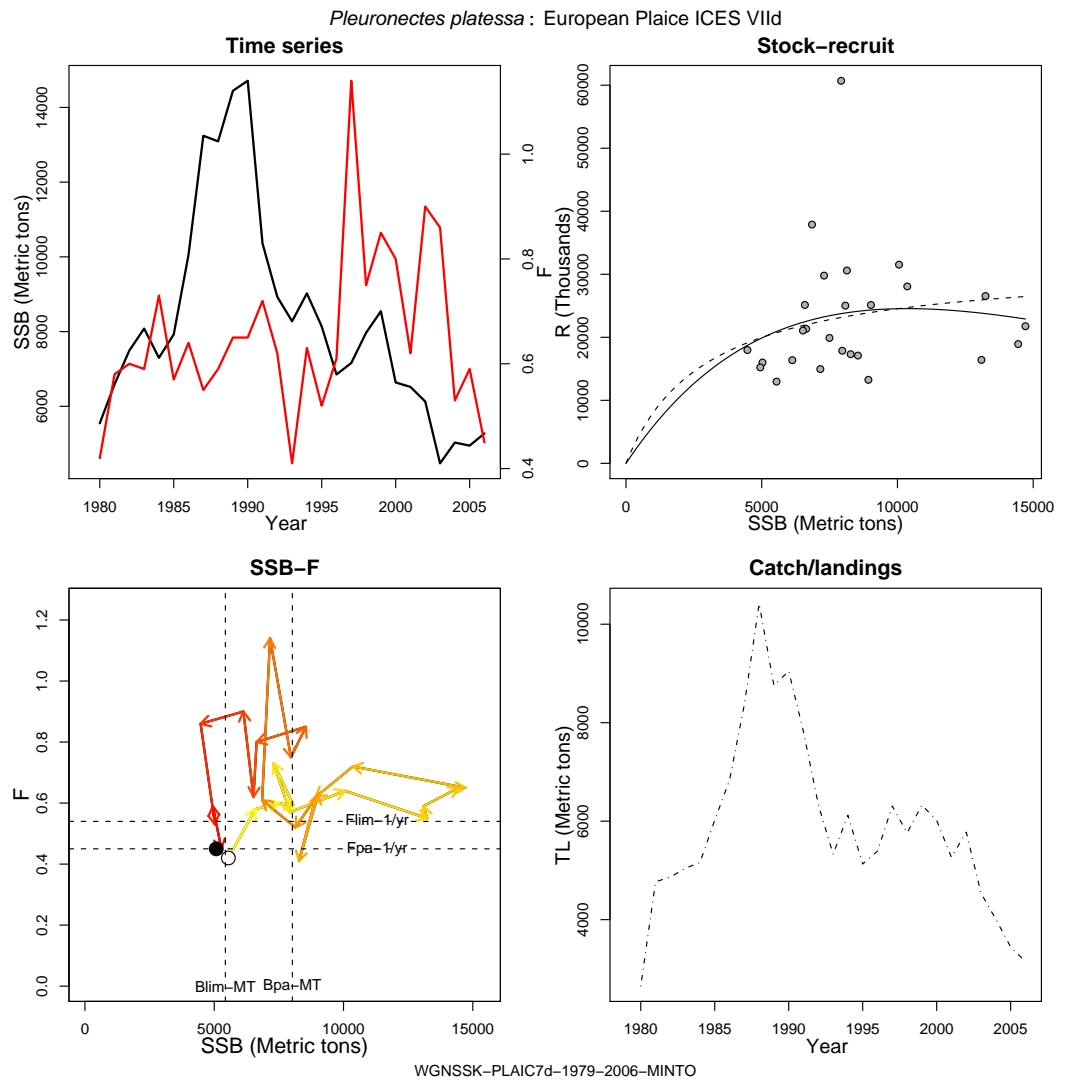


NMFS-ESOLEPCOAST-2007-FOGARTY

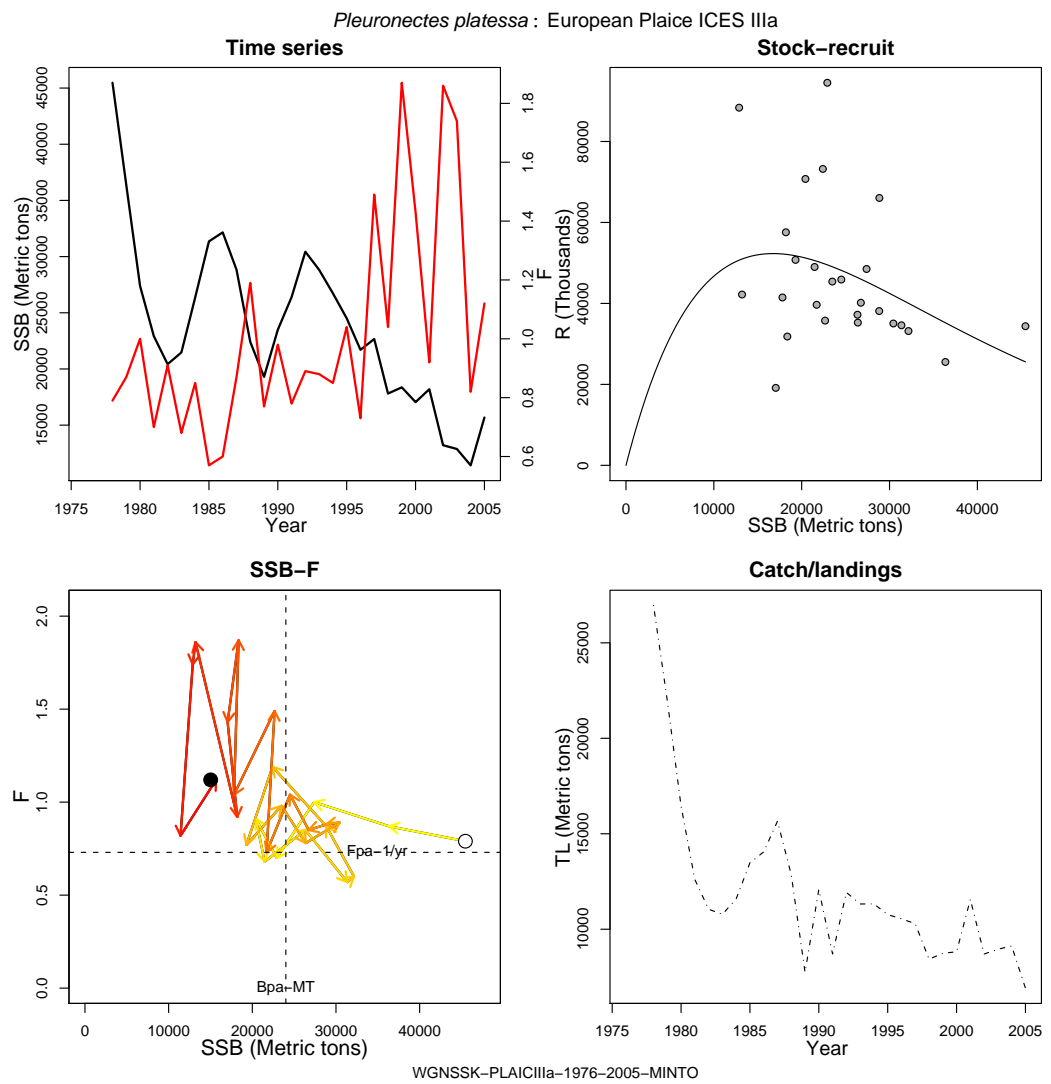
Pleuronectes platessa - European Plaice



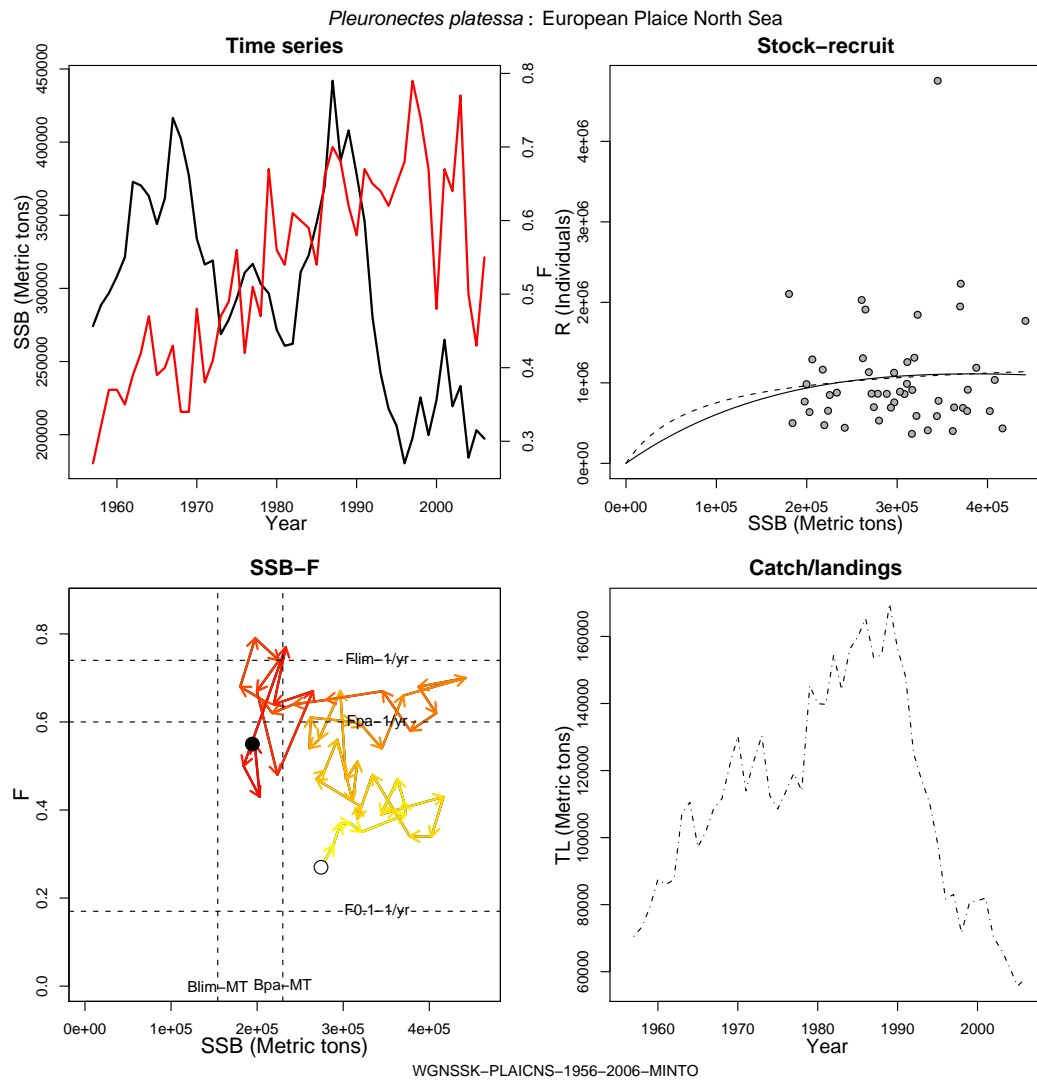
Pleuronectes platessa - European Plaice



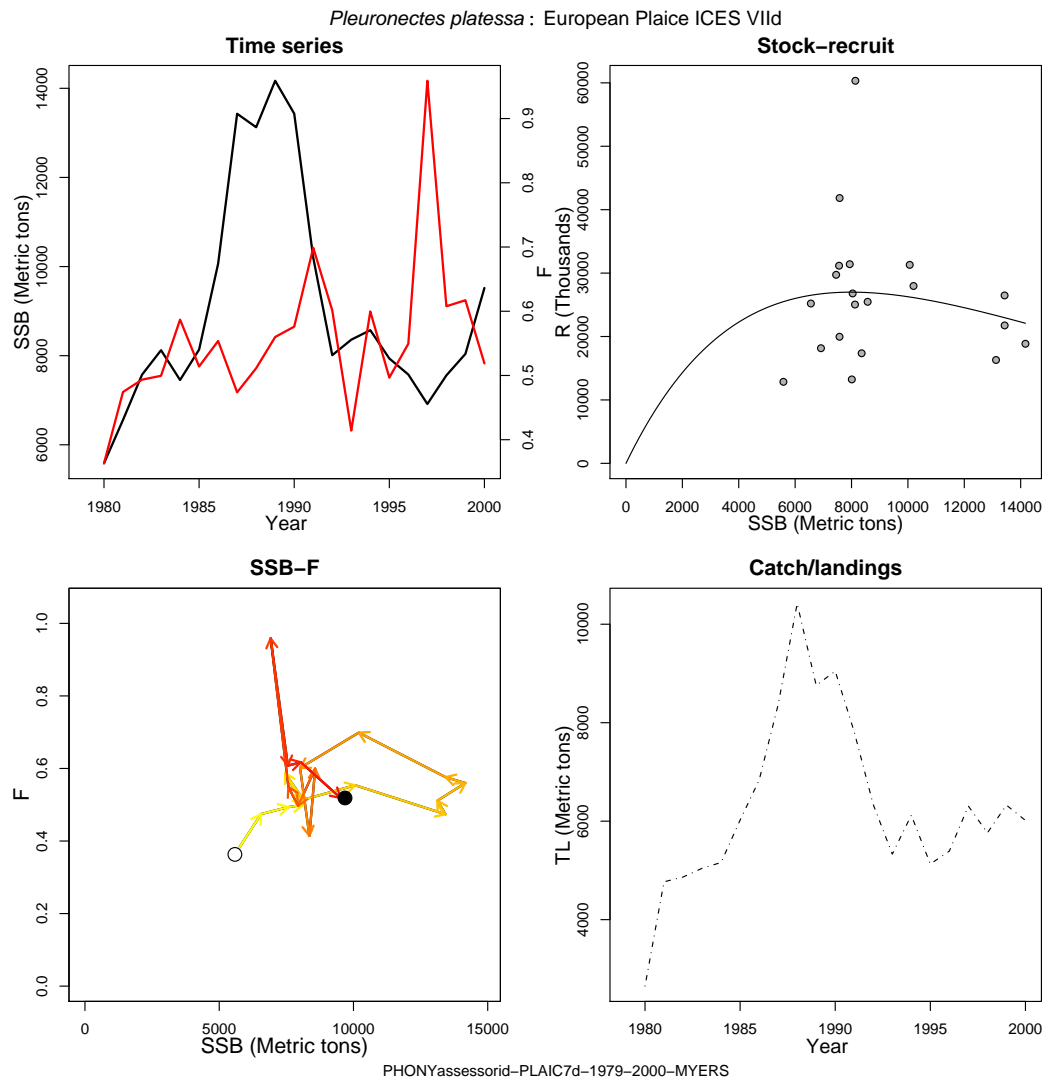
Pleuronectes platessa - European Plaice



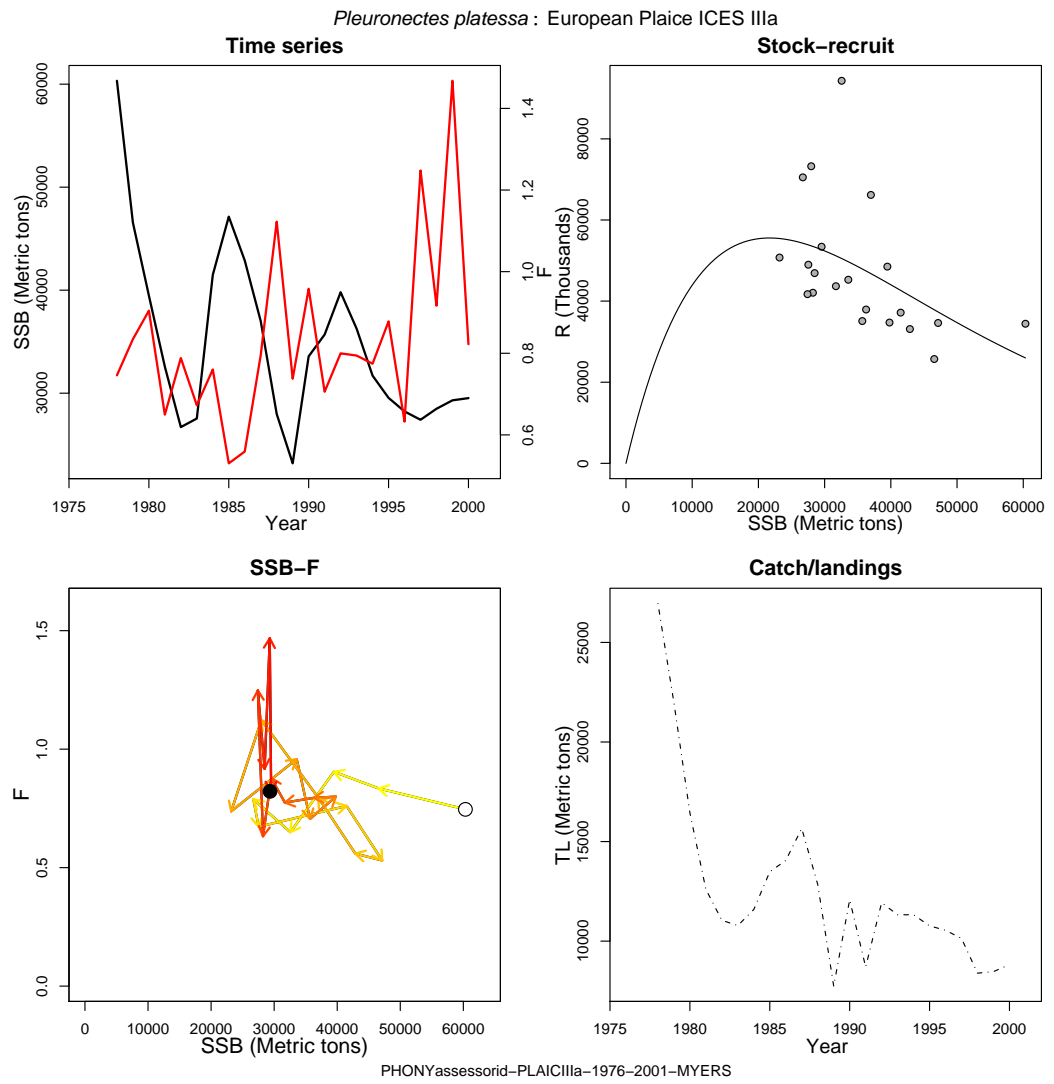
Pleuronectes platessa - European Plaice



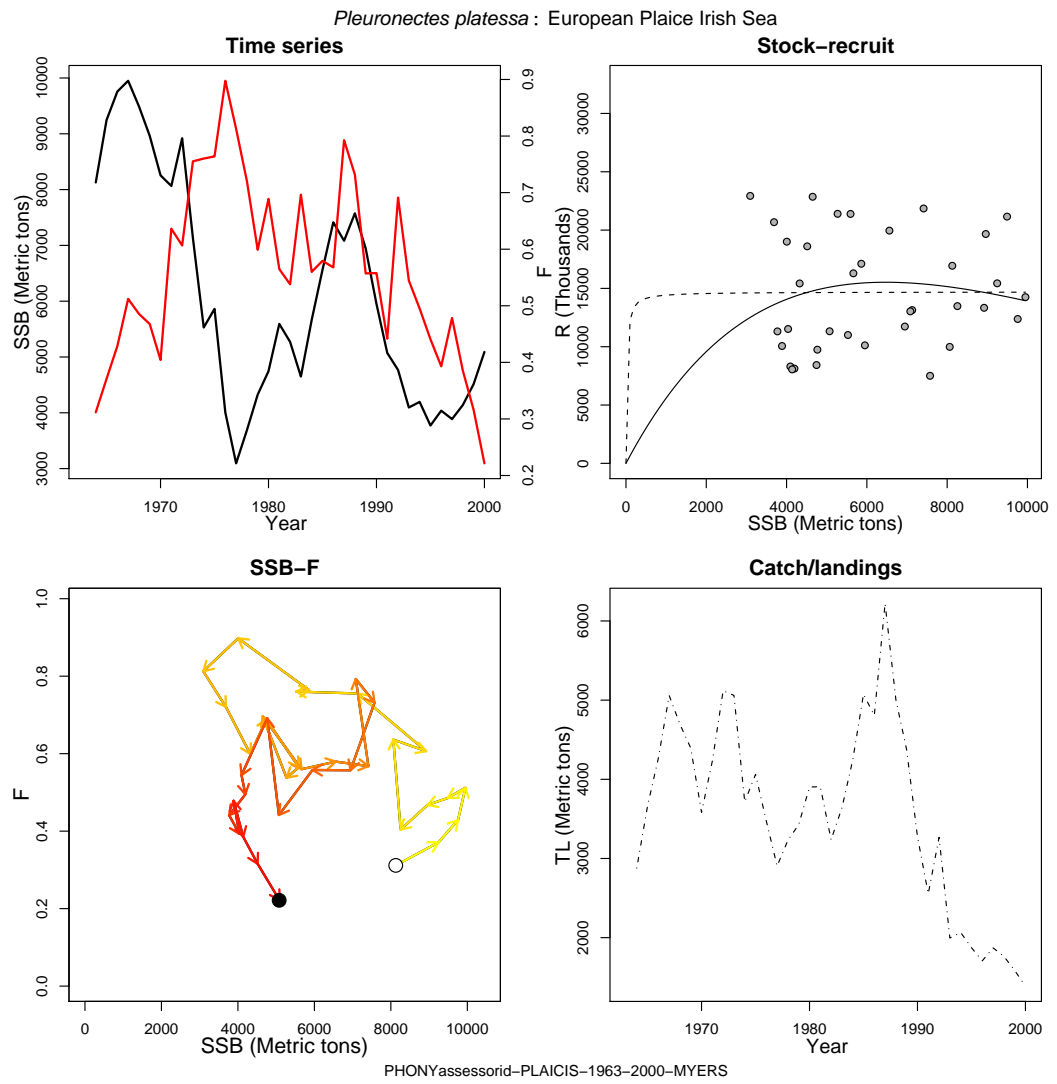
Pleuronectes platessa - European Plaice



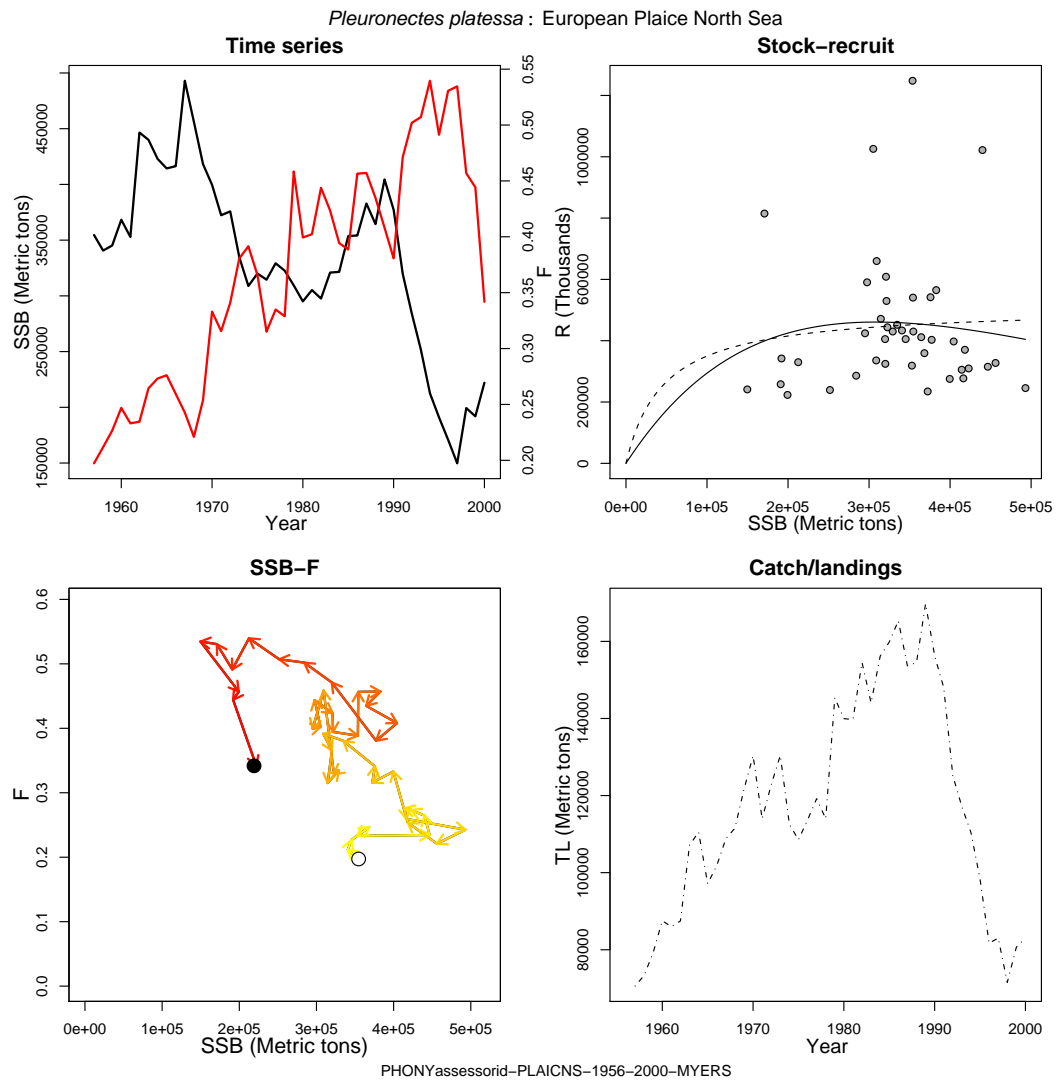
Pleuronectes platessa - European Plaice



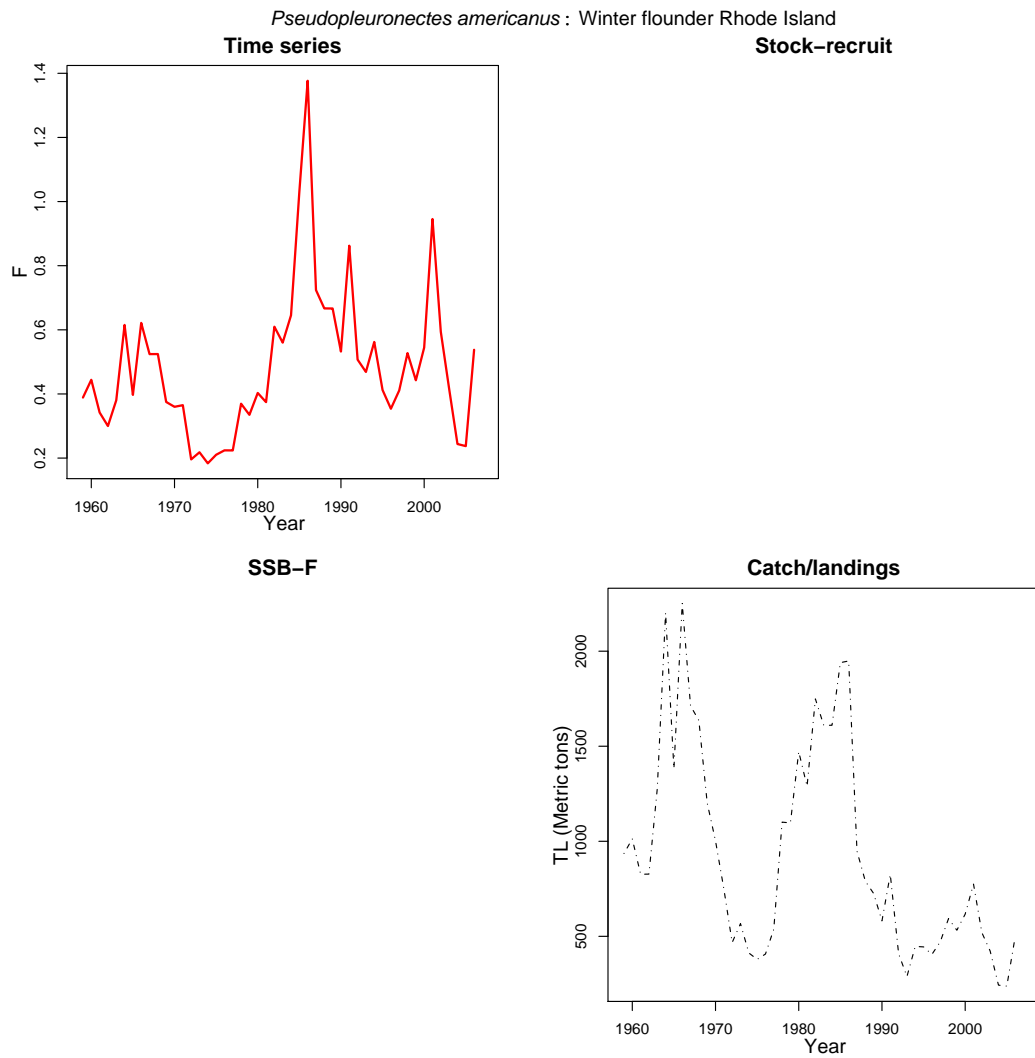
Pleuronectes platessa - European Plaice



Pleuronectes platessa - European Plaice

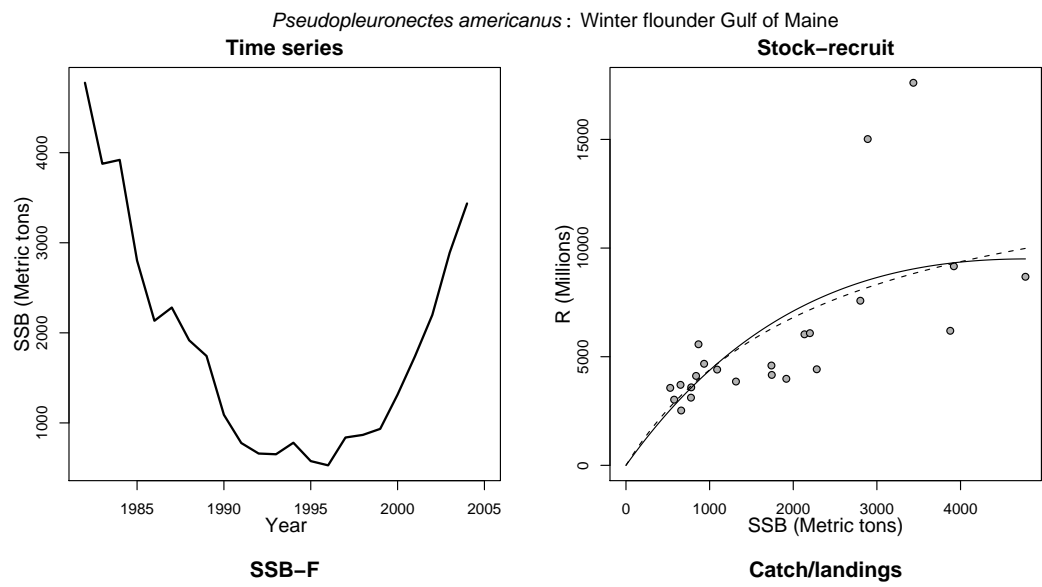


Pseudopleuronectes americanus - Winter flounder



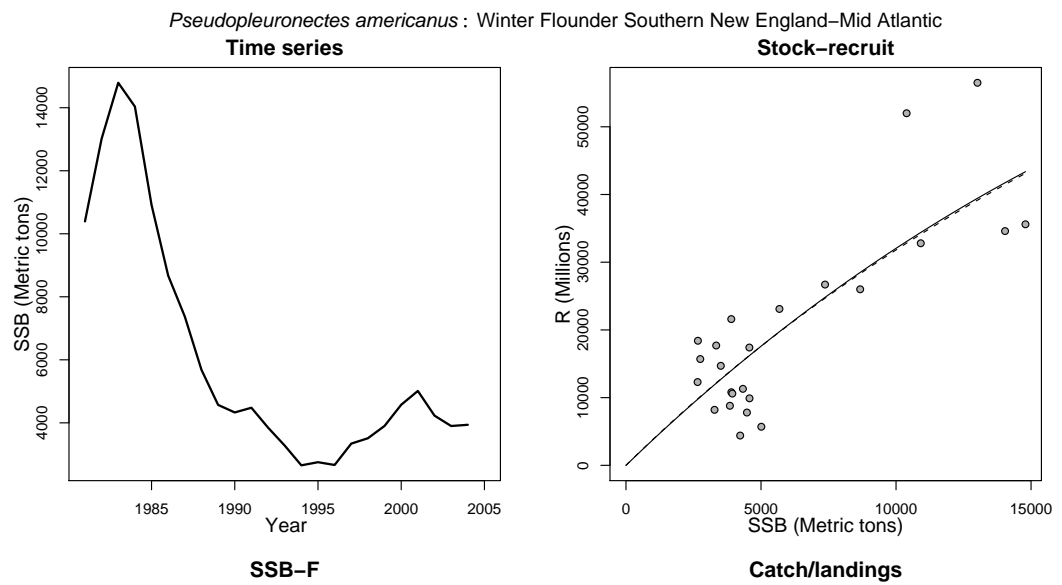
RIDEM-WINFLOUNDRI-YEAR-2007-COLLIE

Pseudopleuronectes americanus - Winter flounder



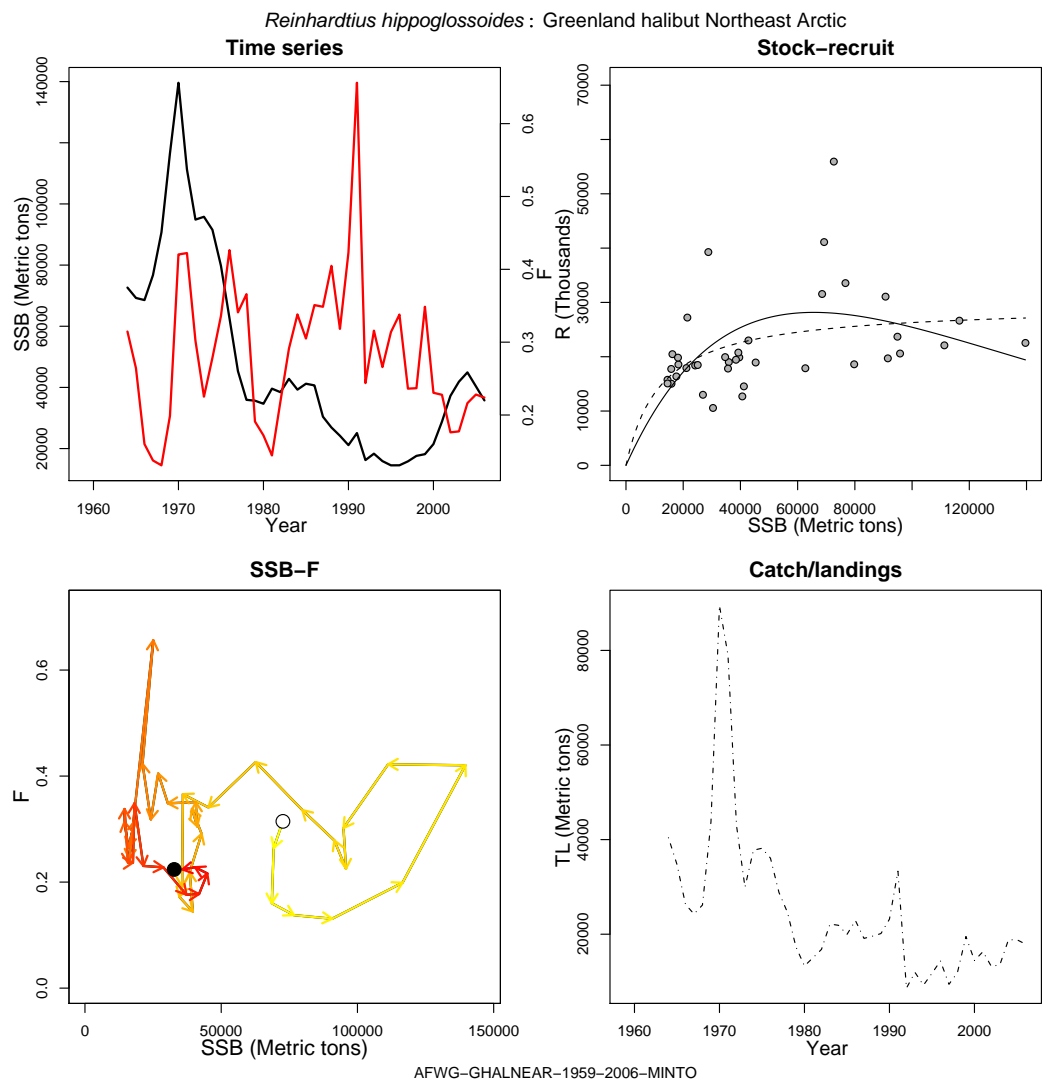
NMFS-WINFLOUNGOM-2005-FOGARTY

Pseudopleuronectes americanus - Winter flounder

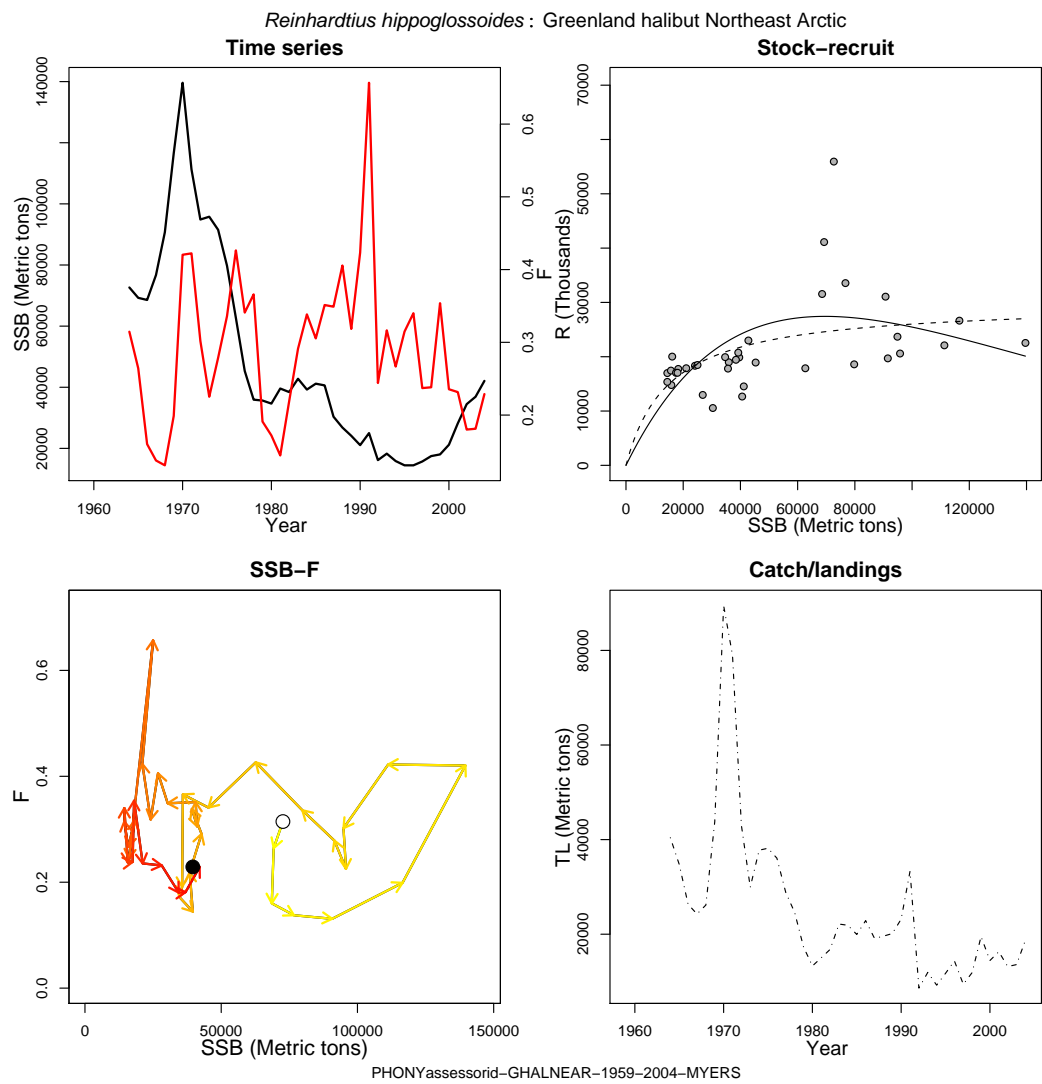


NMFS-WINFLOUNSNEMATL-2005-FOGARTY

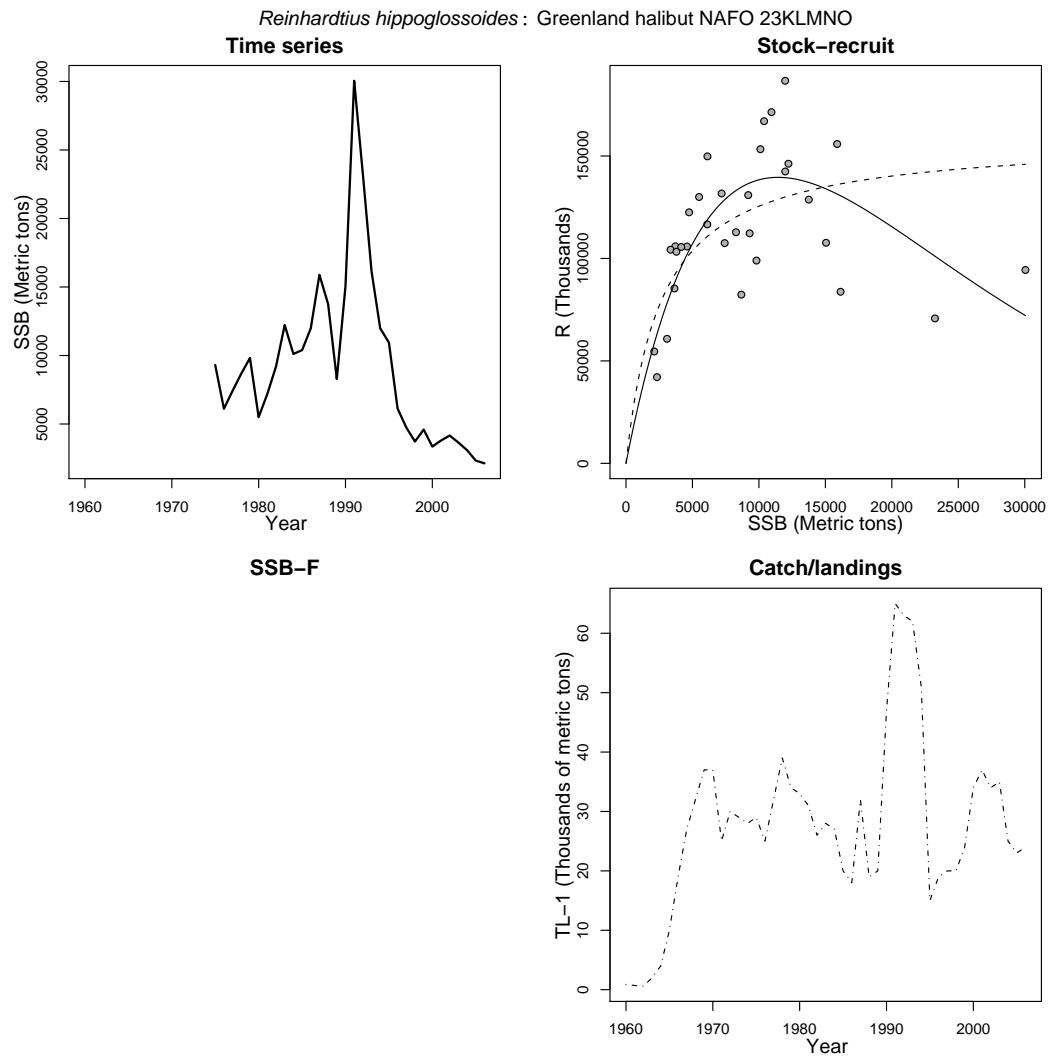
Reinhardtius hippoglossoides - Greenland halibut



Reinhardtius hippoglossoides - Greenland halibut



Reinhardtius hippoglossoides - Greenland halibut

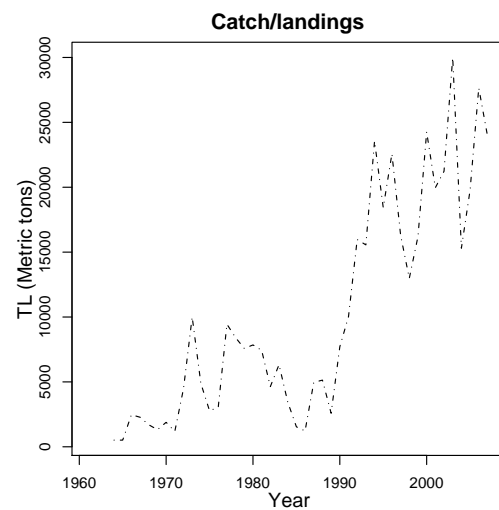


NAFO-SC-GHAL23KLMNO-1960-2006-PREFONTAINE

Reinhardtius stomias - Arrowtooth flounder

Atheresthes stomias : Arrowtooth flounder Gulf of Alaska
Time series **Stock-recruit**

SSB-F

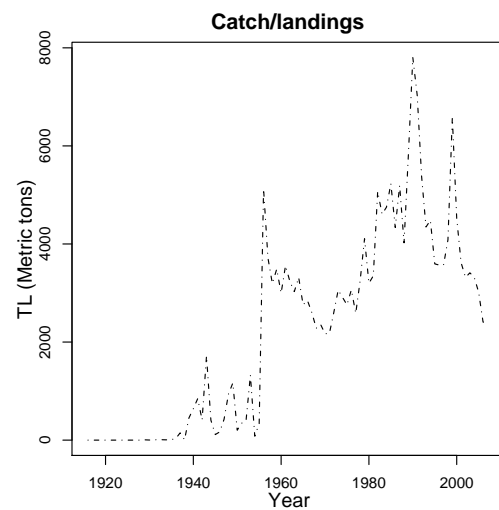


NMFS-ARFLOUNDGA-2007-FOGARTY

Reinhardtius stomias - Arrowtooth flounder

Reinhardtius stomias : Arrowtooth flounder Pacific Coast
Time series **Stock-recruit**

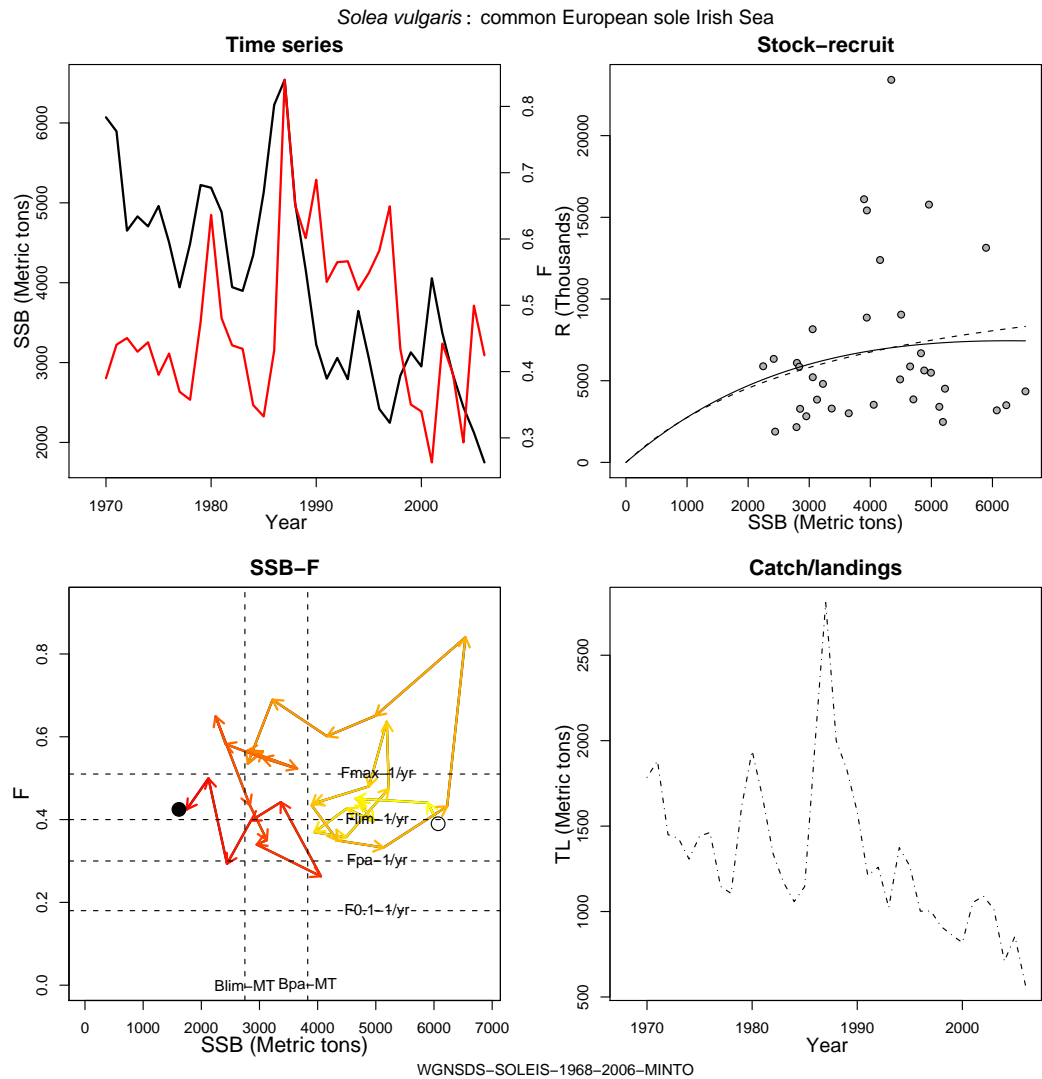
SSB-F



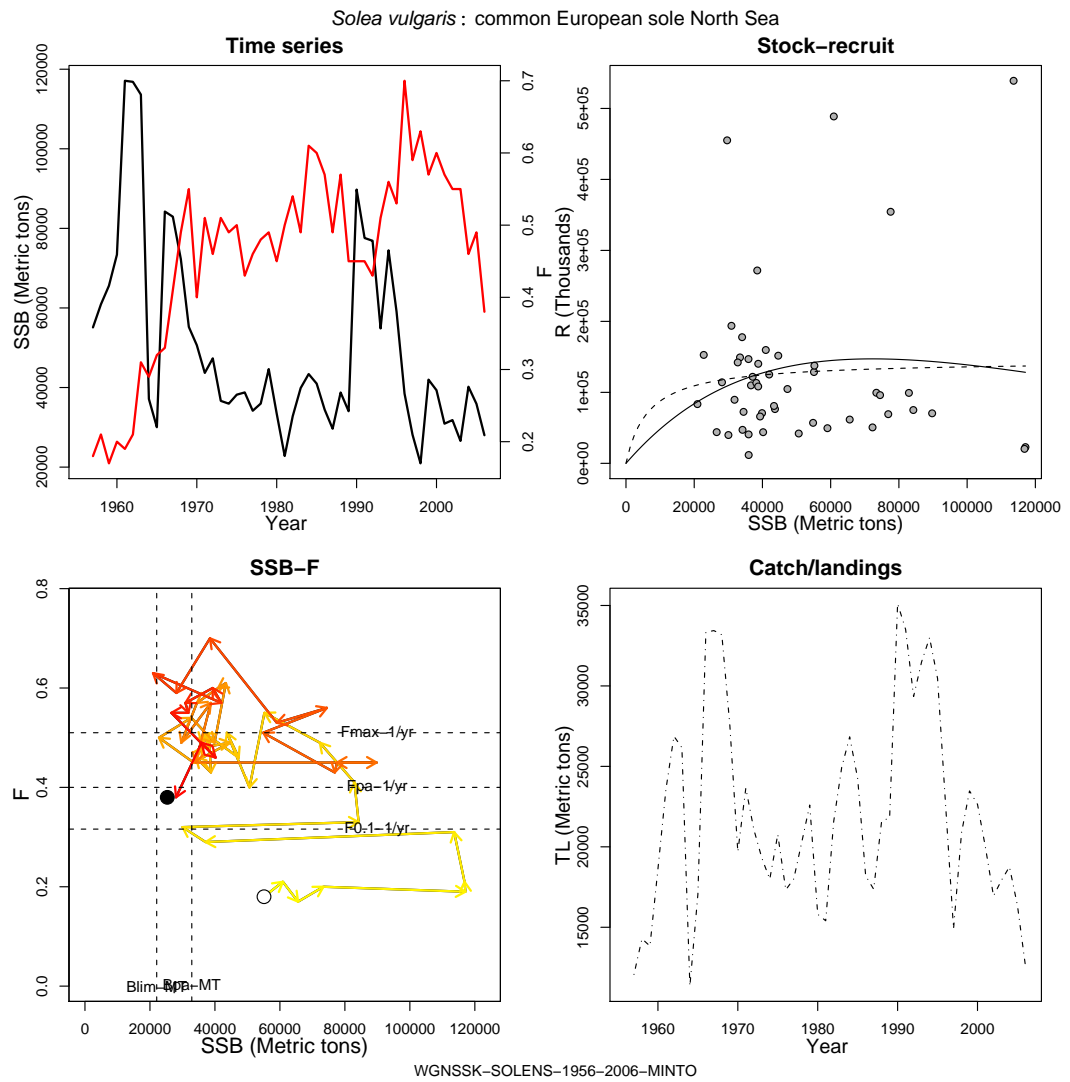
NMFS-ARFLOUNDPCOAST-2007-FOGARTY

3.11.3 Soleidae

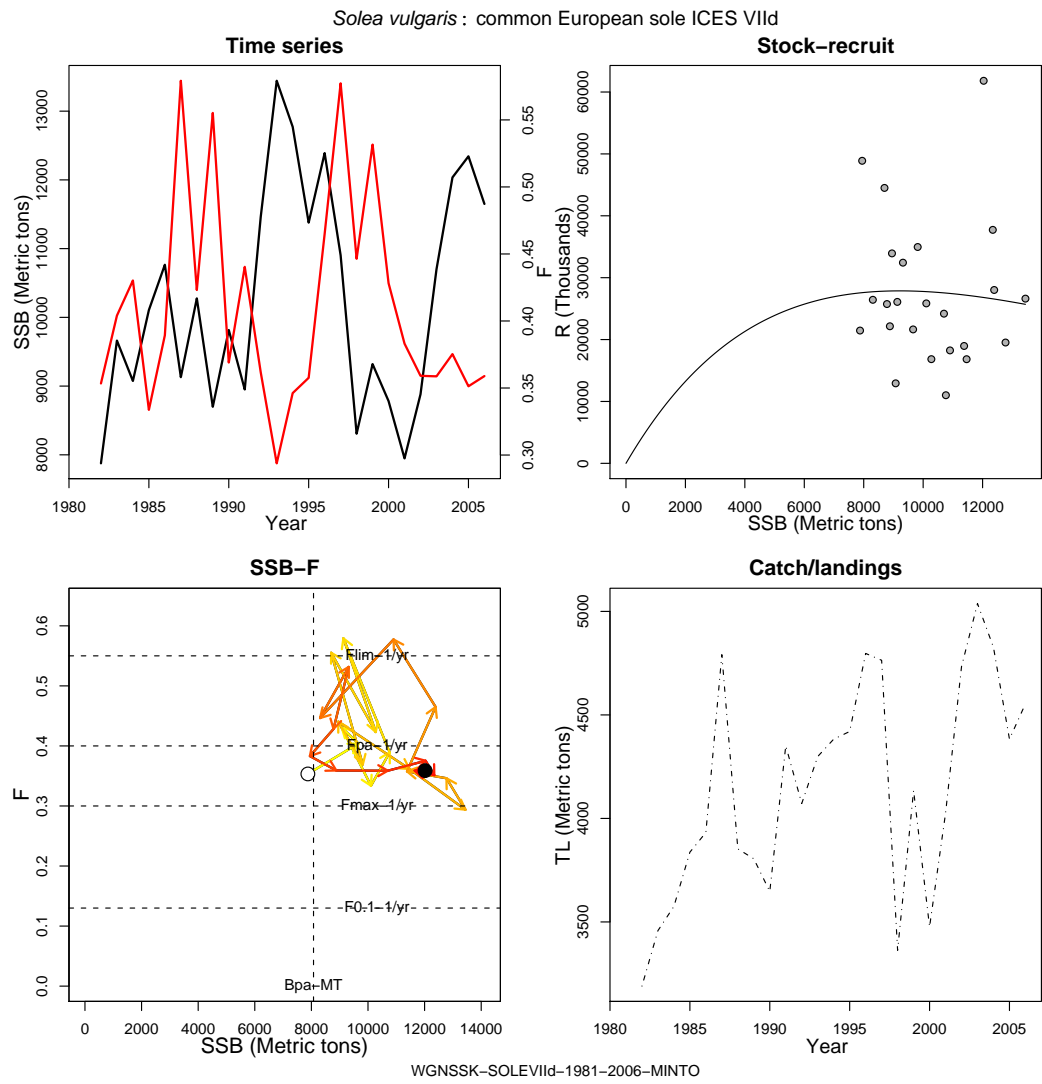
Solea vulgaris - common European sole



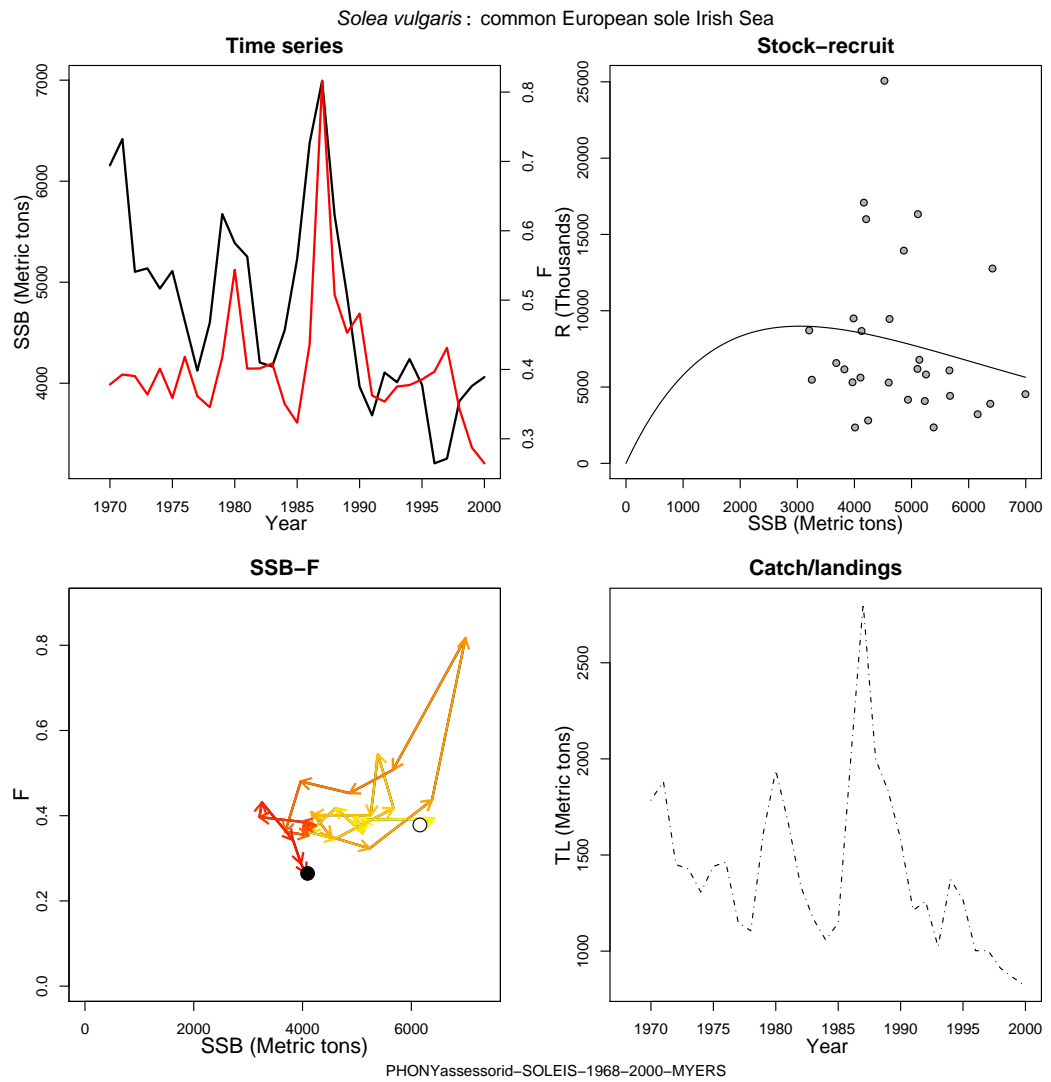
Solea vulgaris - common European sole



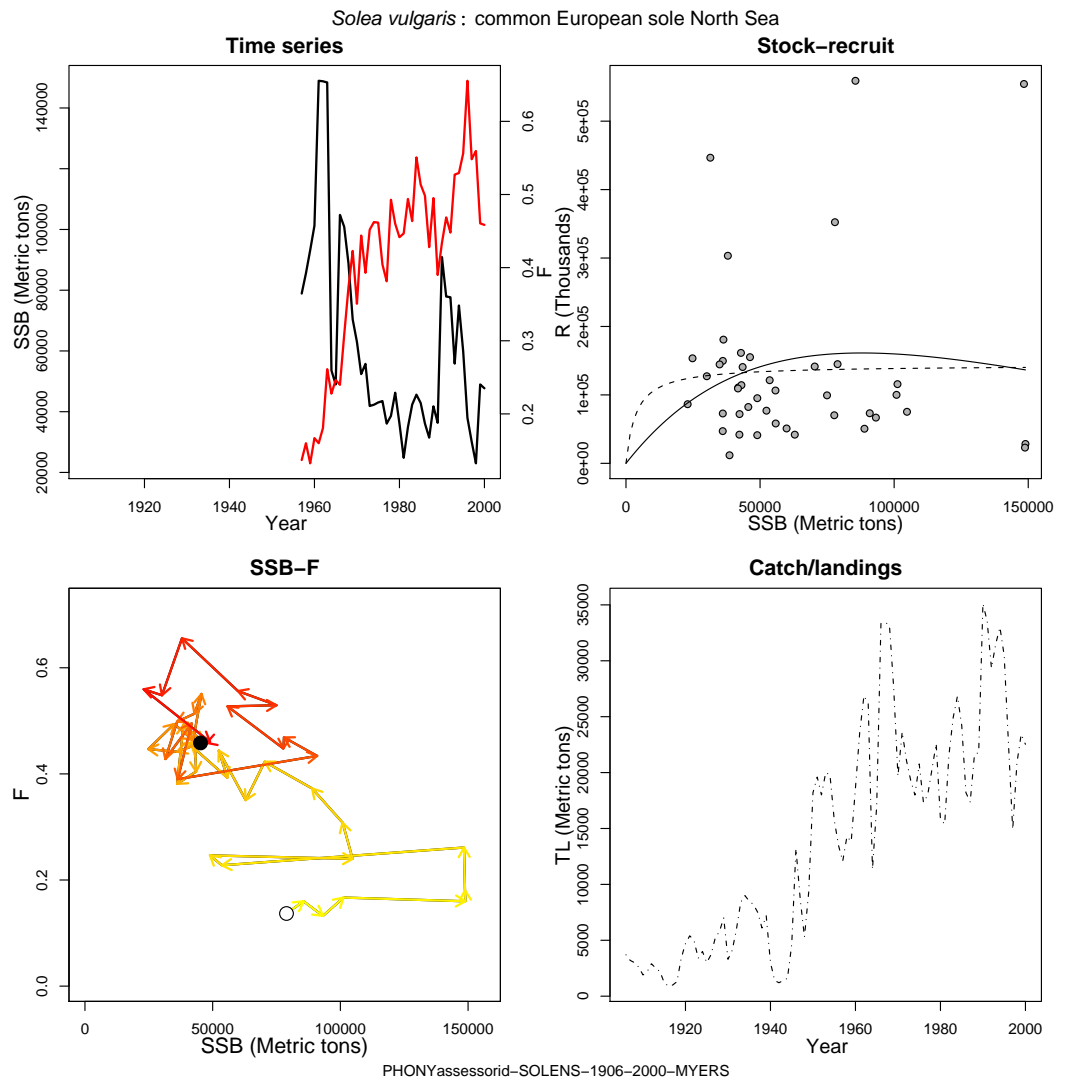
Solea vulgaris - common European sole



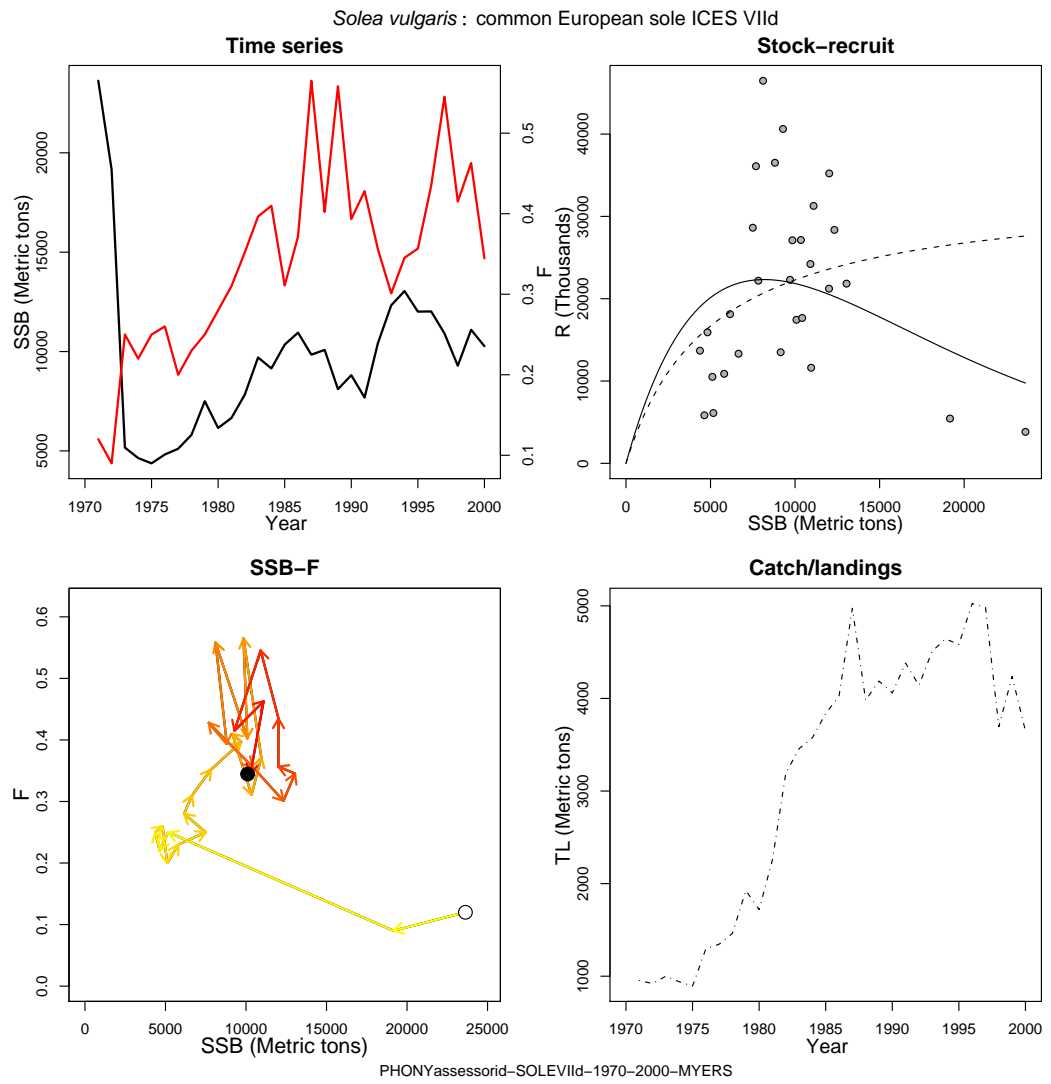
Solea vulgaris - common European sole



Solea vulgaris - common European sole



Solea vulgaris - common European sole



3.12 Rajiformes

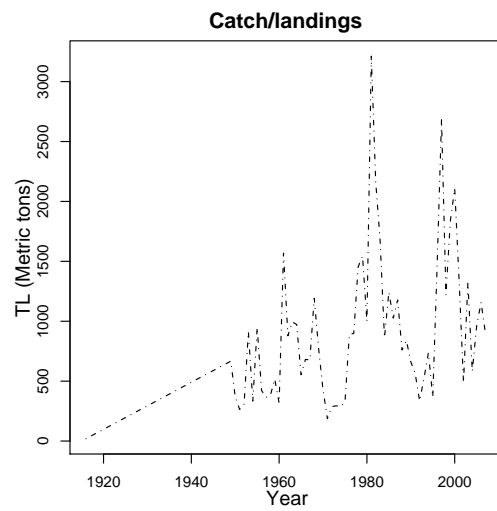
3.12.1 Rajidae

Raja rhina - Longnose skate

Raja rhina : Longnose skate Pacific Coast

Time series Stock-recruit

SSB-F



NMFS-LNOSESKAPCOAST-2007-FOGARTY

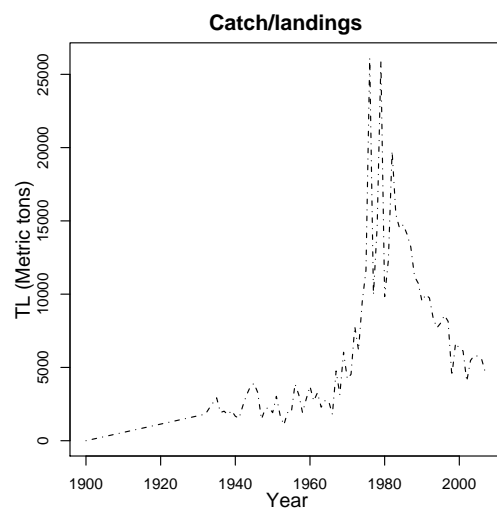
3.13 Scorpaeniformes

3.13.1 Anoplopomatidae

Anoplopoma fimbria - Sablefish

Anoplopoma fimbria : Sablefish Pacific Coast
Time series Stock-recruit

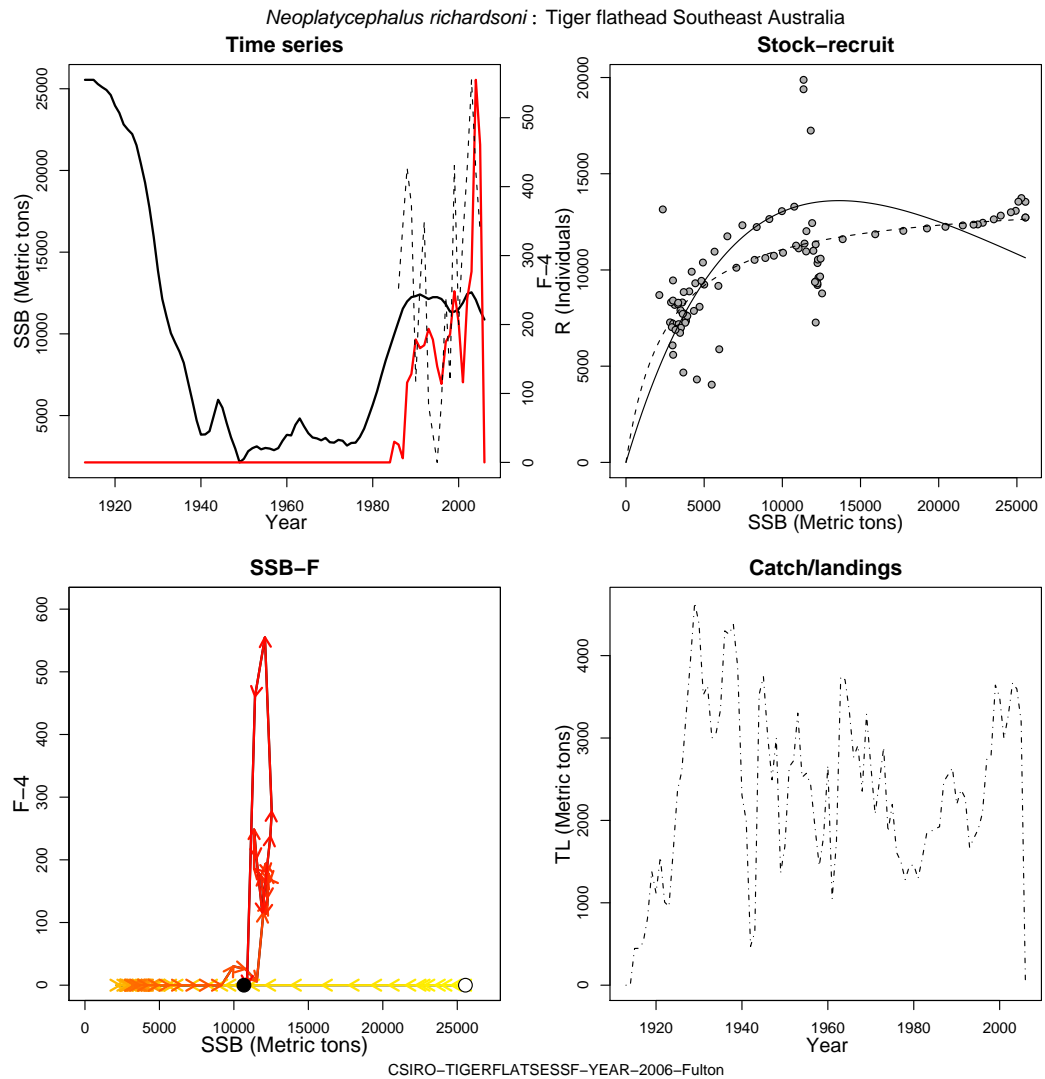
SSB-F



NMFS-SABLEFPCOAST-2007-FOGARTY

3.13.2 Platycephalidae

Neoplatycephalus richardsoni - Tiger flathead

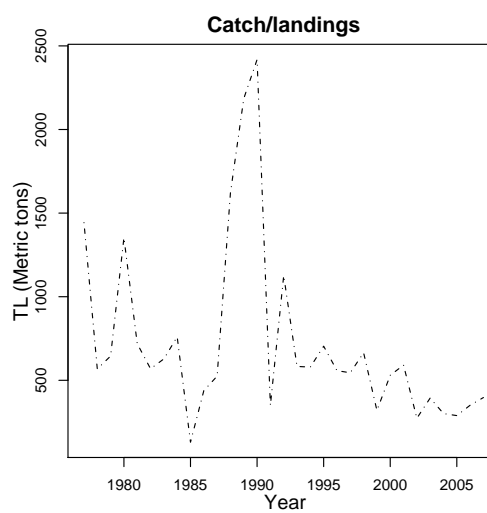


3.13.3 Scorpaenidae

Sebastes aleutianus - Rougheye rockfish

Sebastes aleutianus : Rougheye rockfish Gulf of Alaska
Time series **Stock-recruit**

SSB-F



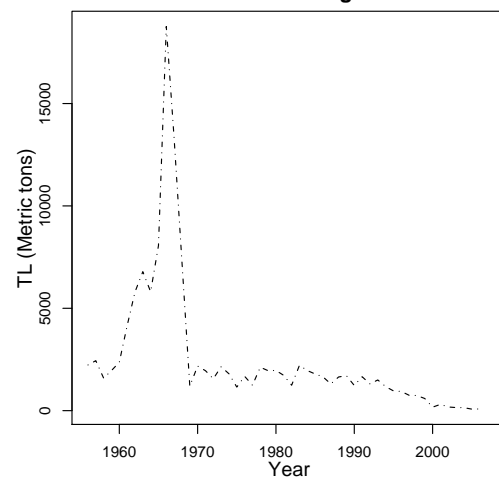
NMFS-REYEROCKGA-2007-FOGARTY

Sebastes alutus - Pacific ocean perch

Sebastes alutus : Pacific ocean perch Pacific Coast
Time series **Stock-recruit**

SSB-F

Catch/landings

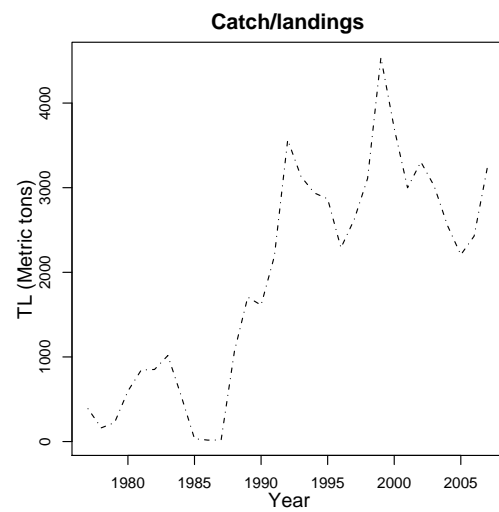


NMFS-POPERCHPCOAST-2007-FOGARTY

Sebastes ciliatus - Dusky rockfish

Sebastes ciliatus : Dusky rockfish Gulf of Alaska
Time series **Stock-recruit**

SSB-F

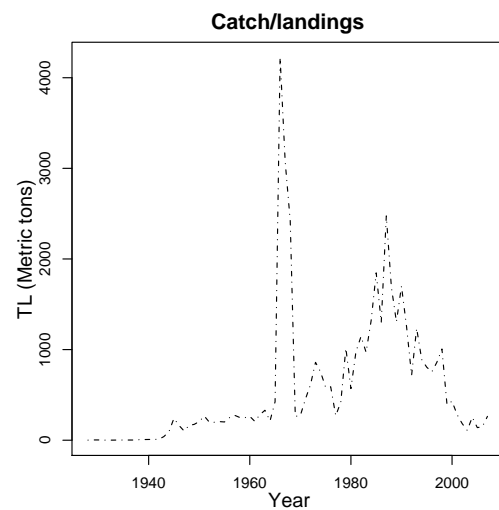


NMFS-DUSKYROCKGA-2007-FOGARTY

Sebastes crameri - Darkblotched rockfish

Sebastes crameri : Darkblotched rockfish Pacific Coast
Time series **Stock-recruit**

SSB-F

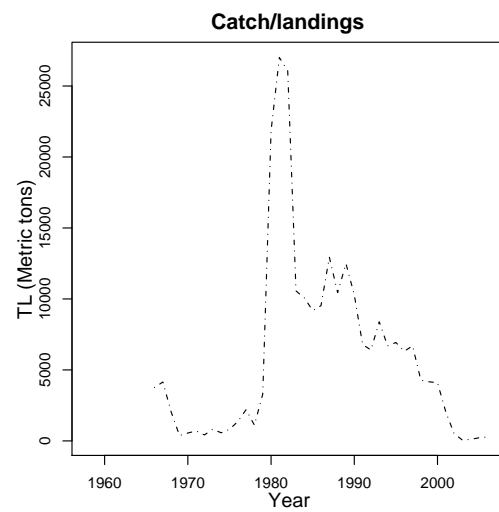


NMFS-DKROCKPCOAST-2007-FOGARTY

Sebastes entomelas - Widow rockfish

Sebastes entomelas : Widow rockfish Pacific Coast
Time series **Stock-recruit**

SSB-F



NMFS-WROCKPCOAST-2007-FOGARTY

Sebastes fasciatus - Acadian redfish

Sebastes fasciatus : Acadian redfish Gulf of Maine / Georges Bank
Time series **Stock-recruit**

SSB-F

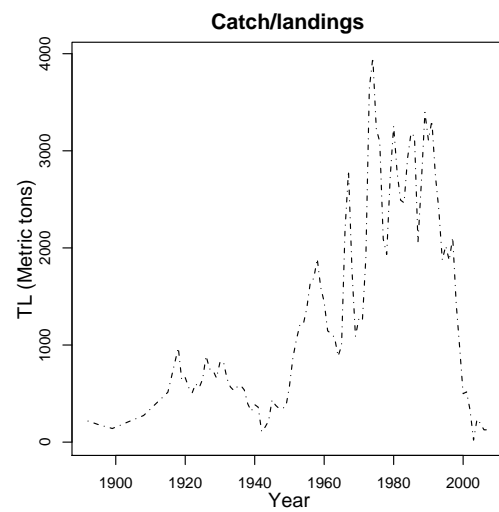
Catch/landings

NMFS-ACADREDGOMGB-2005-FOGARTY

Sebastes goodei - Chilipepper rockfish

Sebastes goodei : Chilipepper Southern Pacific Coast
Time series **Stock-recruit**

SSB-F

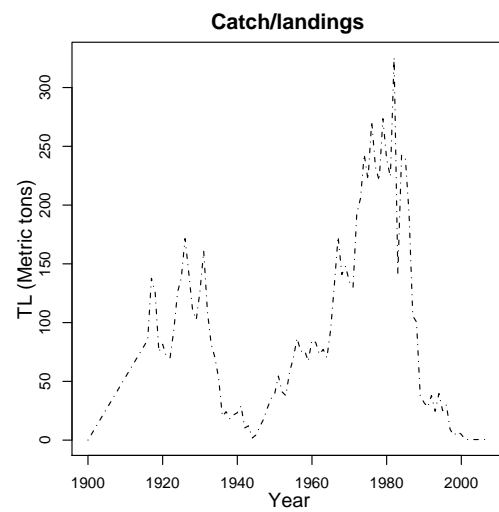


NMFS-CHILISPCOAST-2007-FOGARTY

Sebastes levis - Cowcod

Sebastes levis : Cowcod Southern California
Time series **Stock-recruit**

SSB-F

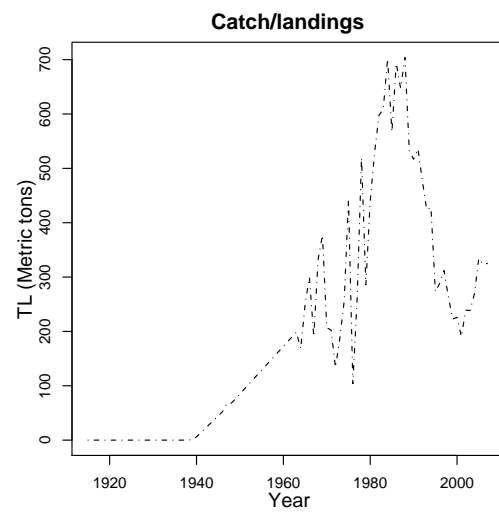


NMFS-COWCODSCAL-2007-FOGARTY

Sebastes melanops - Black rockfish

Sebastes melanops : Black rockfish Northern Pacific Coast
Time series **Stock-recruit**

SSB-F

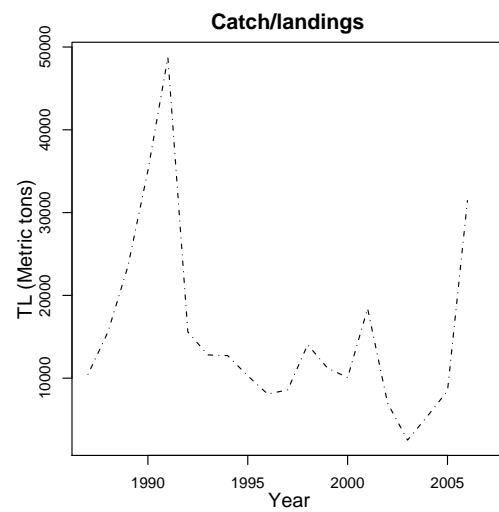


NMFS-BLACKROCKNPNCOAST-2007-FOGARTY

Sebastes mentella - Deepwater redfish

Sebastes mentella : Deepwater Redfish Northeast Arctic
Time series **Stock-recruit**

SSB-F



AFWG-REDDEPI_II-1987-2007-MINTO

Sebastes mystinus - Blue rockfish

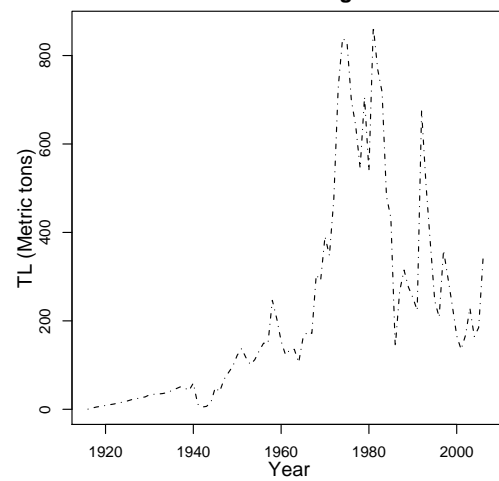
Sebastes mystinus : Blue rockfish California

Time series

Stock-recruit

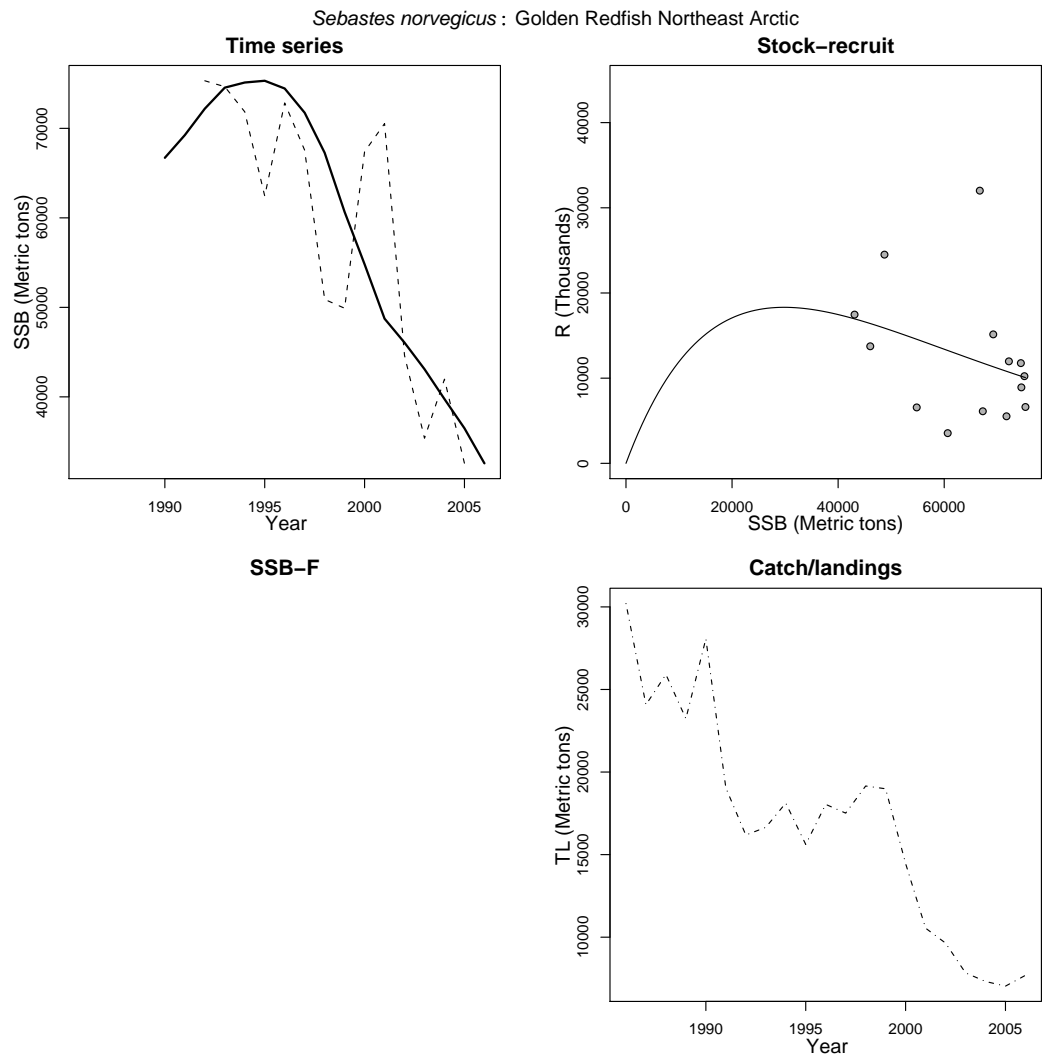
SSB-F

Catch/landings



NMFS-BLUEOCKCAL-2007-FOGARTY

Sebastes norvegicus - Golden Redfish

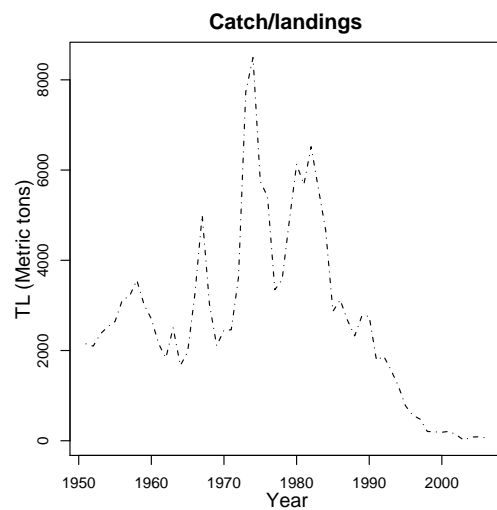


AFWG-GOLDREDNEAR-1986-2006-MINTO

Sebastes paucispinis - Bocaccio

Sebastes paucispinis : Bocaccio Southern Pacific Coast
Time series **Stock-recruit**

SSB-F

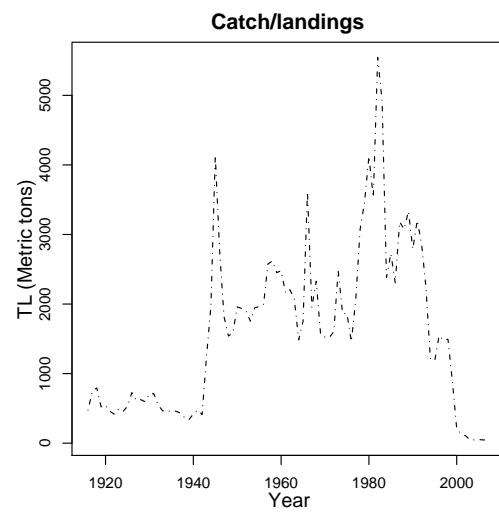


NMFS-BOCACCSPCOAST-2007-FOGARTY

Sebastes pinniger - Canary rockfish

Sebastes pinniger : Canary rockfish Pacific Coast
Time series **Stock-recruit**

SSB-F

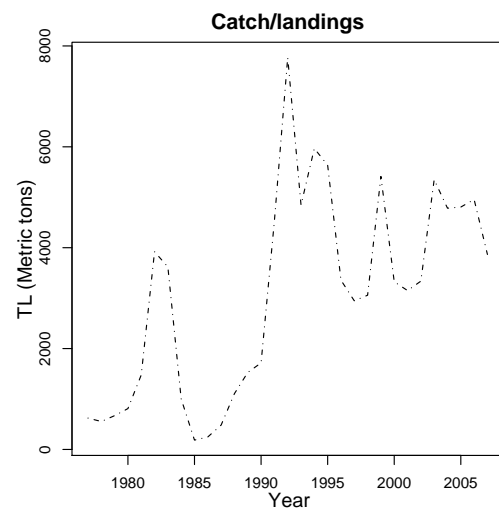


NMFS-CROCKPCOAST-2007-FOGARTY

Sebastes polyspinis - Northern rockfish

Sebastes polyspinis : Northern rockfish Gulf of Alaska
Time series **Stock-recruit**

SSB-F

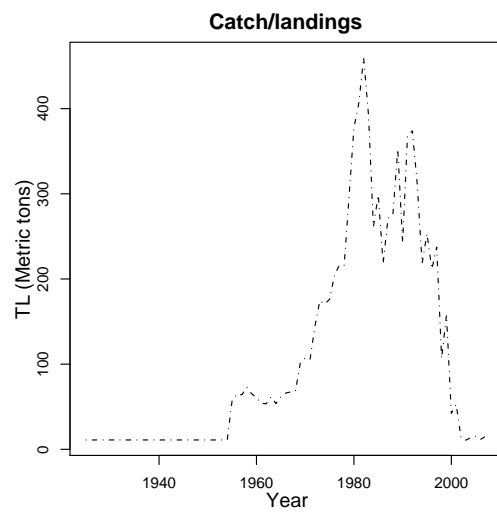


NMFS-NROCKGA-2007-FOGARTY

Sebastes ruberrimus - Yelloweye rockfish

Sebastes ruberrimus : Yelloweye rockfish Pacific Coast
Time series **Stock-recruit**

SSB-F



NMFS-YEYEROCKPCOAST-2007-FOGARTY

3.14 Tetraodontiformes

3.14.1 Balistidae

Balistes capriscus - Gray triggerfish

Balistes capriscus : Gray triggerfish Gulf of Mexico
Time series **Stock-recruit**

SSB-F

Catch/landings

NMFS-GTRIGGM-2006-FOGARTY

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