

Spatial disentangling of Greek commercial fisheries landings by gear between 1928-2007

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Supplementary material

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TABLE S1. Spatial aggregation of the 41 prefectures (legends showed in Fig. 1) surveyed by the Agricultural Statistic of Greece (ASG), 1975-2007, into 16 fishing subareas (S) surveyed by the Hellenic Statistical Authority of Greece (HELSTAT) and spatial disaggregation of the five fishing regions surveyed by Anonymous (2001) during 1996-2001, into 16 HELSTAT fishing subareas (S). When one HELSTAT subarea included more than one ASG prefectures the sum of the number of inshore vessels belonging to these prefectures was used. In contrast, when one prefecture belonging to more than one HELSTAT subareas, the number of inshore vessels from that prefecture was disaggregated according to the proportion of the number of inshore vessels belonging to each fishing port located within each of 16 HELSTAT subareas to the total number of ASG fishing ports belonging to that prefecture

Coastal prefectures*	HELSTAT subareas (NSSG)	Fishing regions (Anonymous, 2001)
1. Evros	S14	North Aegean
2. Rodopi	S14	
3. Xanthi	S14	
4. Kavala	S14	
5. Serres	S14	
6. Chalkidiki	S13-S14	
7. Thessaloniki	S13	
8. Imathia	S13	Central Aegean
9. Pieria	S13	
10. Larisa	S13	
11. Magnisia	S11	
12. Fthiotida	S10	
13. Evvoia	S10-S12	
14. Lesvos	S15	
15. Chios	S15	
16. Samos	S15	
17. Dodekanisos	S16	
18. Lasithi	S18	Cretan Sea
19. Irakleio	S18	South Aegean
20. Rethymnis	S18	
21. Chania	S18	
22. Kyklades	S17	
23. Lakonia	S7	Central Aegean
24. Arkadia	S7-S8	
25. Argolida	S8	
26. Peiraeus	S8	Central Aegean
27. Attiki	S8-S10	
28. Voiotia	S9	
29. Fokida	S9	
30. Korinthia	S9	
31. Achaia	S5-S9	Ionian
32. Ileia	S6	
33. Messinia	S6	
34. Zakynthos	S5	
35. Kefallinia	S5	
36. Etolia-Akarnania	S5	
37. Lefkada	S4-S5	
38. Arta	S4	
39. Preveza	S3-S4	
40. Thesprotia	S3	
41. Kerkyra	S3	

TABLE S2. Spatial aggregation of the 176 fishing ports registered to Common Fisheries Registry (CFR), 1991-2007, into the 16 fishing subareas (S) surveyed by the Hellenic Statistical Authority of Greece (HELSTAT)

Fishing ports (CFR)	HELSTAT subareas	Fishing ports (CFR)	HELSTAT subareas
Gaios	S3	Peireaus	S8
Igoumenitsa	S3	Porto Cheli	S8
Kerkyra	S3	Salamina	S8
Parga	S3	Spetses	S8
Sagiada	S3	Tolo	S8
Sivota	S3	Hydra	S8
Amfilochia	S4	Egio	S9
Lefkada	S4	Antikyra	S9
Nidri (Kefalonia Island)	S4	Galaxidi	S9
Preveza	S4	Isthmia	S9
Argostoli	S5	Itea	S9
Astakos	S5	Kiato	S9
Fiskardo	S5	Nafpaktos	S9
Ithaca	S5	Poros	S9
Lixouri	S5	Porto Germeno	S9
Mesologgi-Alikes	S5	Agios Konstantinos	S10
Patra	S5	Edipsos	S10
Poros (Kefalonia island)	S5	Aliveri	S10
Sami (Kefalonia island)	S5	Arkitsa	S10
Zakynthos	S5	Vasilika (Evvoia island)	S10
Kalamata	S6	Chalkida	S10
Katakolo	S6	Eretria	S10
Koroni	S6	Glyfa (Fthiotida)	S10
Killini	S6	Karystos	S10
Kiparissia	S6	Kimasio (Mantoudi-Lesvos island)	S10
Palouki	S6	Larymna	S10
Pilos	S6	Lavrio	S10
Agia Pelagia	S7	Markopoulo Mesogaiais	S10
Agios Nikolaos (Messinia)	S7	Limni (Evvoia island)	S10
Gythio	S7	Marmari (Evvoia island)	S10
Kagiali	S7	Menidi	S10
Monemvasia	S7	Nea Stira	S10
Neapoli	S7	Pefki	S10
Egina	S8	Rafina	S10
Aspropyrgos	S8	Skala Atalantis	S10
Elefsina	S8	Stilida	S10
Ermioni	S8	oreioi	S10
Kilada	S8	Oropos	S10
Korinthos	S8	Agia Kyriaki	S11
Leonidio	S8	Volos	S11
Megara	S8	Alonissos	S12
Methana	S8	Glossa (Skopelos island)	S12
Nafplio	S8	Kimi (Evvoia Island)	S12
Palaia Epidavros	S8	Petriai	S12
Paralion Astros	S8	Skiathos	S12
Skopelos	S12	Fry (Kasos island)	S16

TABLE S2. continued

Fishing ports (CFR)	HELSTAT subareas	Fishing ports (CFR)	HELSTAT subareas
Skyros	S12	Kalymnos	S16
Agiokampos	S13	Karpathos	S16
Dafni (Chalkidiki)	S13	Kos	S16
Gerakini	S13	Lakkio (Leros Island)	S16
Katerini	S13	Lipsi	S16
Neos Marmaras	S13	Mandraki (Nisyros island)	S16
Nea Moudania	S13	Megisti (Kastelorizo island)	S16
Nea Michaniona	S13	Patmos	S16
Palaioa Fokaia	S13	Rhodes	S16
Platamonas	S13	Simi	S16
Thessaloniki	S13	Adamantas (Milos island)	S17
Alexandroupoli	S14	Andros (City)	S17
Eleftheres	S14	Antiparos	S17
Ierissos	S14	Astipalaia	S17
Kavala	S14	Ermoupoli (Syros island)	S17
Keramoti	S14	Folegandros	S17
Limenaria (Thasos island)	S14	Gaurio	S17
Maroneia	S14	Ios	S17
Ouranoupoli	S14	Kamares (Sifnos island)	S17
Porto-Lagos	S14	Katapolla	S17
Prinos	S14	Kimolos	S17
Thassos	S14	Korrisia (Kea island)	S17
Samothraki	S14	Merikas (Kythnos island)	S17
Stavros (Thessaloniki)	S14	Mikonos	S17
Stratoni	S14	Naxos	S17
Chios	S15	Paros (Chora)	S17
Kardamaina	S15	Thira (Santorini island)	S17
Limani Meston (Chios island)	S15	Serifos	S17
Mithimna	S15	Tinos	S17
Moudros (Lesvos island)	S15	Agios Nikolaos (Cretan)	S18
Mirina (Limnos island)	S15	Agia Galini (Cretan)	S18
Mitilini (Lesvos island)	S15	Chania	S18
Karlovasi (Samos island)	S15	Chora Sfakion	S18
Oinouses (Chios island)	S15	Herakleion	S18
Perama (Lesvos island)	S15	Ierapetra	S18
Plomari (Lesvos island)	S15	Kali Limenes	S18
Polichnitos	S15	Kastri Viannou (Cretan)	S18
Pithagoreio	S15	Kissamos (Kasteli Chania)	S18
Samos	S15	Kokkinos Pyrgos	S18
Sigri (Iesvos island)	S15	Palaiochora (Cretan)	S18
Agios Kirikos	S16	Rethymno	S18
Evdilos	S16	Sitia	S18
Fournoi	S16		

TABLE S3. Taxonomic disaggregation by species (or groups of species) for 1928-2007. No scientific names is provided for Gurnards, Tuna fish, "other crustacean-cephalopod species" and "other crustacean species" groups

GSSG (1928-1949)	FAO (1950-1963)	Reconstructed 1950-1963	NSSG (1964-1981)	NSSG (1982-2007)
<i>Boops boops</i> <i>Conger conger</i> <i>Dentex dentex</i>	<i>Belone belone</i> * <i>Boops boops</i> <i>Dentex dentex</i> *	<i>Belone belone</i> <i>Boops boops</i> ¹ <i>Dentex dentex</i> <i>Dentex macrophthalmus</i> ⁴	<i>Auxis thazard</i> ¹ <i>Belone belone</i> ** <i>Boops boops</i> - <i>Sarpa salpa</i> <i>Dentex dentex</i> - <i>Pagrus pagrus</i> <i>Dentex macrophthalmus</i> - <i>Pagellus erythrinus</i>	<i>Auxis thazard</i> ¹ <i>Belone belone</i> <i>Boops boops</i> <i>Dentex dentex</i> <i>Dentex macrophthalmus</i>
<i>Dicentrarchus labrax</i> <i>Diplodus annularis</i>	<i>Dicentrarchus labrax</i> *	<i>Dicentrarchus labrax</i> <i>Engraulis encrasicolus</i> <i>Epinephelus alexandrinus</i> ²	<i>Dicentrarchus labrax</i> ** <i>Diplodus annularis</i> ** <i>Diplodus sargus sargus</i> ** <i>Engraulis encrasicolus</i> <i>Epinephelus marginatus</i> / <i>alexandrinus</i> - <i>Polyprion americanus</i> <i>Epinephelus marginatus</i> ⁺ / <i>alexandrinus</i> - <i>Polyprion americanus</i> ⁺ <i>Euthynus alletteratus</i> ¹	<i>Dicentrarchus labrax</i> <i>Diplodus annularis</i> <i>Diplodus sargus sargus</i> <i>Engraulis encrasicolus</i> <i>Epinephelus alexandrinus</i> <i>Epinephelus marginatus</i> <i>Epinephelus marginatus</i> <i>Euthynus alletteratus</i> ¹
<i>Galeorhinus galeus</i> <i>Gobius</i> spp.		<i>Gurnards</i> ⁷	<i>Scorpaenidae</i> - <i>Triglidae</i> - <i>Gurnards</i> <i>Helicolenus dactylopterus</i> **	<i>Gurnards</i> <i>Helicolenus dactylopterus</i>
<i>Lithognathus mommyrus</i>		<i>Katsuwonus pelamis</i> ⁵	<i>Sarda sarda</i> - <i>Katsuwonus pelamis</i> <i>Lophius</i> spp.** <i>Merlangius merlangus</i> ** <i>Merluccius merluccius</i> - <i>Micromesistius putassou</i> <i>Merluccius merluccius</i> - <i>Micromesistius putassou</i>	<i>Katsuwonus pelamis</i> <i>Lophius</i> spp. <i>Merlangius merlangus</i> <i>Merluccius merluccius</i> <i>Micromesistius putassou</i>
<i>Merluccius merluccius</i>	<i>Merluccius merluccius</i> <i>Micromesistius putassou</i>	<i>Merluccius merluccius</i> <i>Micromesistius putassou</i>	<i>Mugilidae</i> <i>Mullus</i> spp. <i>Mullus barbatus</i> ³	<i>Mugilidae</i> <i>Mullus surmuletus</i> <i>Mustelus</i> spp.
<i>Mugilidae</i> <i>Mullus barbatus</i> ⁺	<i>Mugilidae</i> <i>Mullus</i> spp. <i>Mullus barbatus</i> ³	<i>Mugilidae</i> <i>Mullus</i> spp./ <i>Mullus barbatus</i> ⁺ <i>Mullus surmuletus</i> ³	<i>Mugilidae</i> <i>Mullus</i> spp./ <i>Mullus surmuletus</i> ⁺ <i>Mustelus</i> spp.**	<i>Mugilidae</i> <i>Mullus surmuletus</i> <i>Mustelus</i> spp.
<i>Mullus surmuletus</i> ⁺ <i>Mustelus</i> spp.- <i>Scyliorhinus</i> spp.	<i>Mullus surmuletus</i> ⁺ <i>Mustelus</i> spp.- <i>Scyliorhinus</i> spp.	<i>Mullus</i> spp./ <i>Mullus barbatus</i> ⁺ <i>Mullus surmuletus</i> ³ <i>Mustelus</i> spp.**	<i>Mullus</i> spp./ <i>Mullus surmuletus</i> ⁺ <i>Mustelus</i> spp.**	<i>Mullus surmuletus</i> <i>Mustelus</i> spp.

TABLE S3. continued

GSSG (1928-1949)	FAO (1950-1963)	Reconstructed 1950-1963	NSSG (1964-1981)	NSSG (1982-2007)
<i>Oblada melanura</i> “other Osteichthyes” group	“other Osteichthyes” group*	“other Osteichthyes” group	<i>Oblada melanura</i> ** “other Osteichthyes” group	<i>Oblada melanura</i> “other Osteichthyes” group
<i>Pagellus erythrinus</i>	<i>Pagellus</i> spp.	<i>Pagellus</i> spp. ⁴	<i>Dentex macrophthalmus-Pagellus erythrinus</i>	<i>Pagellus erythrinus</i>
<i>Pagrus pagrus</i>	<i>Pagrus pagrus</i>	<i>Pagrus pagrus</i>	<i>Dentex dentex-Pagrus pagrus</i>	<i>Pagrus pagrus</i>
<i>Polyprion americanus</i> ⁺		<i>Polyprion americanus</i> ²	<i>E. marginatus/alexandrinus-Polyprion americanus</i>	<i>Polyprion americanus</i>
		<i>Psetta maxima</i> ⁸	<i>Pomatomus saltatrix</i> **	<i>Pomatomus saltatrix</i>
<i>Raja</i> spp.	<i>Raja</i> spp.*	<i>Raja</i> spp.	<i>Solea</i> spp.- <i>Psetta maxima</i>	<i>Psetta maxima</i>
<i>Sarda sarda</i>	<i>Sarda sarda</i>	<i>Sarda sarda</i> ⁵	<i>Raja clavata</i> **	<i>Raja clavata</i>
<i>Sardina pilchardus</i>	<i>Sardina pilchardus</i>	<i>Sardina pilchardus</i>	<i>Raja</i> spp.**	<i>Raja</i> spp.
<i>Sardinella aurita</i>			Rhinobatidae**	Rhinobatidae
<i>Scomber japonicus</i> ⁺	<i>Scomber japonicus</i>	<i>Sarpa salpa</i> ¹	<i>Sarda sarda-Katsuwonus pelamis</i>	<i>Sarda sarda</i>
<i>Scomber scombrus</i> ⁺		<i>Scomber japonicus</i> ⁶	<i>Sardina pilchardus</i>	<i>Sardina pilchardus</i>
Scorpaenidae	Scorpaenidae*	<i>Scomber scombrus</i> ⁶	<i>Sardinella aurita</i> **	<i>Sardinella aurita</i>
<i>Seriola dumerili</i>		Scorpaenidae ⁷	<i>Boops boops-Sarpa salpa</i>	<i>Sarpa salpa</i>
<i>Serranus</i> spp.	Serranidae*	Serranidae	<i>Scomber</i> spp./ <i>Scomber japonicus</i> ⁺	<i>Scomber japonicus</i>
<i>Solea</i> spp.	<i>Solea</i> spp.	<i>Solea</i> spp. ⁸	<i>Scomber</i> spp./ <i>Scomber scombrus</i> ⁺	<i>Scomber scombrus</i>
<i>Sparus aurata</i>	<i>Sparus aurata</i> *	<i>Sparus aurata</i>	Scorpaenidae-Triglididae-Gurnards	Scorpaenidae
<i>Spicara flexuosa</i> ⁺		<i>Spicara flexuosa</i> ⁹	<i>Seriola dumerili</i> **	<i>Seriola dumerili</i>
<i>Spicara maena</i> ⁺	<i>Spicara</i> spp.	<i>Spicara maena</i> ⁹	<i>Serranus</i> spp.**	<i>Serranus</i> spp.
<i>Spicara smaris</i> ⁺		<i>Spicara smaris</i> ⁹	<i>Solea</i> spp.- <i>Psetta maxima</i>	<i>Solea solea</i>
	<i>Spondyliosoma cantharus</i> *	<i>Spondyliosoma cantharus</i>	<i>Sparus aurata</i> **	<i>Sparus aurata</i>
			<i>Spicara</i> spp./ <i>Spicara flexuosa</i> ⁺	<i>Spicara flexuosa</i>
			<i>Spicara</i> spp./ <i>Spicara maena</i> ⁺	<i>Spicara maena</i>
			<i>Spicara</i> spp./ <i>Spicara smaris</i> ⁺	<i>Spicara smaris</i>
			<i>Spondyliosoma cantharus</i>	<i>Spondyliosoma cantharus</i>
<i>Trachurus mediterraneus</i> ⁺	Squalidae	Squalidae	<i>Sprattus sprattus</i> **	<i>Sprattus sprattus</i>
<i>Trachurus trachurus</i> ⁺	<i>Thunnus</i> spp.	<i>Thunnus</i> spp.	Squalidae**	Squalidae
	<i>Trachurus</i> spp.	<i>Trachurus mediterraneus</i> ¹⁰	<i>Thunnus</i> spp. ¹	<i>Thunnus</i> spp. ¹
		<i>Trachurus trachurus</i> ¹⁰	<i>Trachurus</i> spp./ <i>Trachurus mediterraneus</i> ⁺	<i>Trachurus mediterraneus</i>
		Triglidae ⁷	<i>Trachurus</i> spp./ <i>Trachurus trachurus</i> ⁺	<i>Trachurus trachurus</i>
			Scorpaenidae-Triglididae-Gurnards	Triglidae

TABLE S3. continued

GSSG (1928-1949)	FAO (1950-1963)	Reconstructed 1950-1963	NSSG (1964-1981)	NSSG (1982-2007)
Tuna-like fish	<i>Umbrina cirrosa</i> *	<i>Umbrina cirrosa</i>	<i>Umbrina cirrosa</i> <i>Xiphias gladius</i> [†] <i>Zeus faber</i> Tuna-like fish Loliginidae and Ommastrepiidae	<i>Umbrina cirrosa</i> <i>Xiphias gladius</i> [†] <i>Zeus faber</i> Tuna-like fish Loliginidae and Ommas-
trepidae				
Loligo sp.			<i>Loligo</i> spp.	<i>Loligo</i> spp.
Octopodidae			Octopodidae	Octopodidae
<i>Sepia officinalis</i>	<i>Sepia officinalis</i>	<i>Sepia officinalis</i>	<i>Octopus vulgaris</i> <i>Sepia officinalis</i> <i>Carcinus aestuarii</i>	<i>Octopus vulgaris</i> <i>Sepia officinalis</i> <i>Carcinus aestuarii</i>
<i>Hommarus gammarus</i>			<i>Hommarus gammarus</i>	<i>Hommarus gammarus</i>
Natantia	Natantia	Natantia	Natantia	Natantia
<i>Nephrops norvegicus</i>	<i>Nephrops norvegicus</i>	<i>Nephrops norvegicus</i>	<i>Nephrops norvegicus</i> <i>Penaeus kerathurus</i>	<i>Nephrops norvegicus</i> <i>Penaeus kerathurus</i> "other crustacean species"
"Other cephalopods- crustaceans species"				

* Species that were reported as aggregated groups together with the landings of "other Osteichthyes group" during 1950-1957 (matrix C: Table 1) and were reported as individual species landings during 1958-1963 (matrix D: Table 1), were disaggregated into individual species landings during 1950-1957 (matrix T10: Table 4)

** Species that were reported as aggregated groups together with the landings of "other Osteichthyes group" during 1964-1981 (matrices E and H: Table 1) and were reported as individual species landings during 1982-1989 (matrix J: Table 1), were disaggregated into individual species landings, during 1964-1981 (matrix T4: Table 4)

+ Species that were reported as aggregated groups during 1928-1949 (matrices A and B: Table 1) and were reported as individual species during 1950-2007, were disaggregated into individual species landings according Table 4 (matrix T9)

Superscript numbers indicated species that were reported as aggregated groups during 1964-1981 (matrices E and H: Table 1) and were reported as individual species during 1982-1989 (matrix J: Table 1), were disaggregated into individual species landings during 1964-1981 (matrix T3: Table 4)

† indicates the species which landings derived from ICCAT (matrix G: Table 1)

TABLE S4. Mean (\pm s.e.) annual composition of the species that were reported as aggregated groups together with the landings of “other Osteichthyes” group, during 1964-1981 (see online supplementary material, Table S1) and were reported as individual species landings, during 1982-1989, to the landings of the “other Osteichthyes” group (matrix T4: Table 4). Species listed in alphabetic order

Species	% mean (1982-1986)	% s.e.
<i>Belone belone</i>	6.9	0.7
<i>Dicentrarchus labrax</i>	1.9	0.4
<i>Diplodus annularis</i>	5.0	0.6
<i>Diplodus sargus sargus</i>	13.4	0.9
<i>Helicolenus dactylopterus</i>	2.3	0.4
<i>Lophius</i> spp.	5.0	0.6
<i>Merlangius merlangus</i>	2.5	0.4
<i>Mustelus</i> spp.	9.6	0.8
<i>Oblada melanura</i>	13.3	0.9
<i>Pomatomus saltatrix</i>	2.1	0.4
<i>Raja clavata</i>	4.9	0.6
<i>Raja</i> spp.	4.6	0.6
Rhinobatidae	0.3	0.1
<i>Sardinella aurita</i>	2.9	0.4
<i>Seriola dumerili</i>	1.7	0.3
<i>Serranus</i> spp.	4.2	0.5
<i>Sparus aurata</i>	8.2	0.7
<i>Sprattus sprattus</i>	2.3	0.4
Squalidae	6.6	0.7
<i>Umbrina cirrosa</i>	0.7	0.2
<i>Zeus faber</i>	1.7	0.3