Coastal monitoring the state of pink shrimp *Pandalus borealis* population on West Kamchatka

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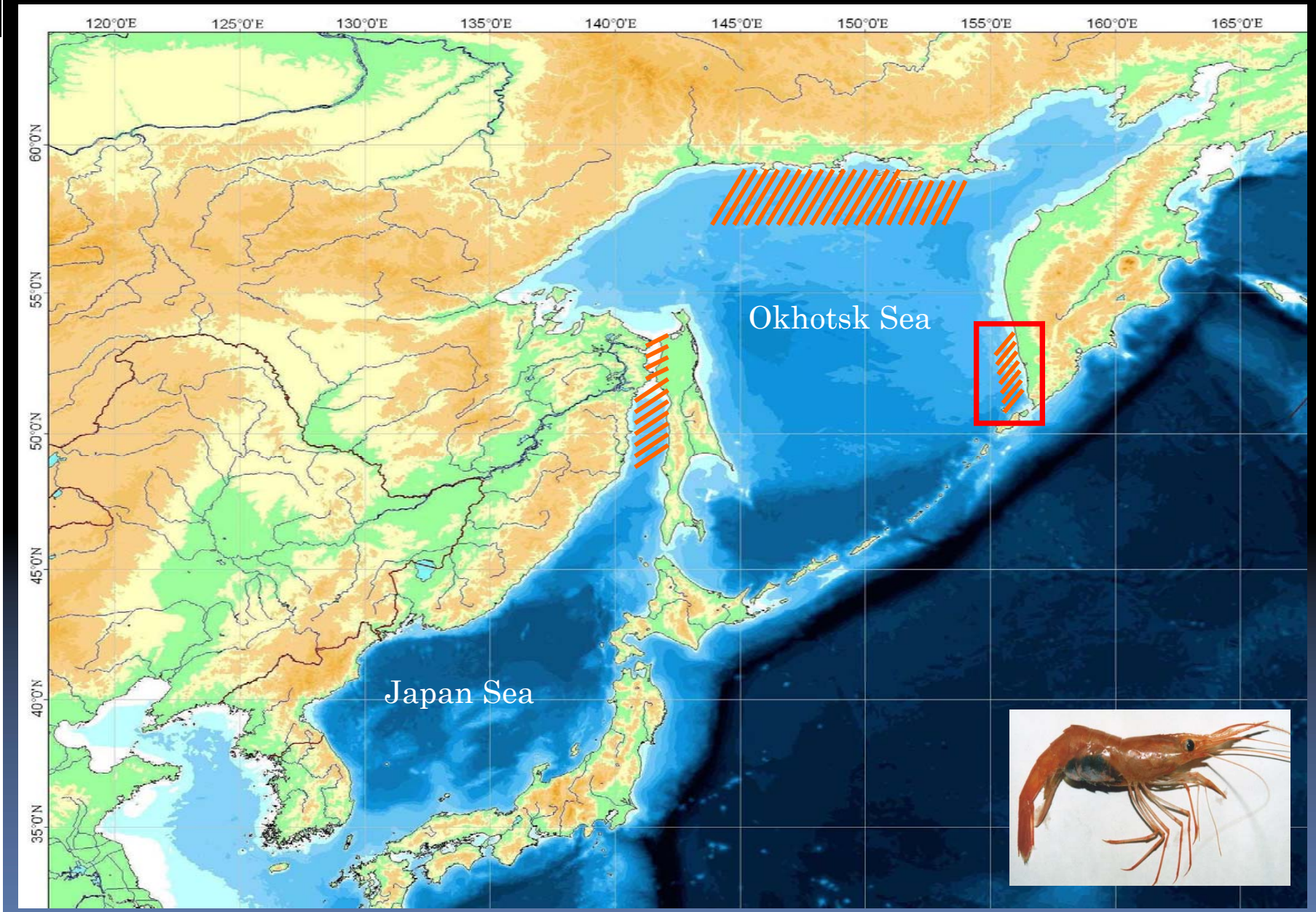
Major sites of commercial harvesting of pink shrimp in Russian waters area



Short of preface

Before the 1970s, when the 200-mile economic zone was set, the resource was exploited solely by commercial fleet of Japan, but the exploiting stopped.

The interest to the resource renewed in 1993, when laboratory of Marine Commercial Invertebrates was formed in KamchatNIRO and commercial aggregations of pink shrimp, mentioned in Russian and foreign literature, have been interesting again to investigate.

Since 1997 the number of vessels engaged into the fishery of pink shrimp in the Kamchatka-Kuril subzone has been growing, and by 2004 it reached 29 units.

Sustainability of fishing, which has began, required having regular data about stock abundance of the resource and figuring out the TAC.

Specialized shrimp fishing vessels

Built in 1985, length – 48.250 m, width – 11.0 m, draught – 5.5 m, power of general engine - 2250 l/sec, speed – 9 knots. The fishing gear used was shrimp bottom pair trawl «Cosmos-2005» made in Denmark. The mesh of the trawl wings is 20 mm, the opening - 35x2 m. The trawl has temperature and depth sensors and selective greed, set in not far from entrance.

Built in 1985 , length – 51.0 m, width – 9.5 m, draught – 6.0 м , power of general engine – 1800 л.с., speed – 11 knots, The fishing gear used was shrimp bottom trawl «Cosmos-3000» made in Denmark. The mesh of the trawl wings is 24 mm, the opening - 64 м, The trawl has temperature and depth sensors and selective greed, set in not far from entrance.

The data obtained on the fishing vessels in 2001-2011 as a result of monitoring of pink shrimp population.

Year	Vessel	The number of trawlings	The number of analyzed individuals
2001	M/V «Sapfir-1»	101	14580
2002	M/V «Asanda»	21	1585
2004	M/V «Alitus»	33	3783
2005	M/V «Aleksandrit»	21	676
		169	5086
2006	M/V «Sapfir-1»	118	3495
2007	M/V «Sapfir-1»	28	2547
2008	M/V «Aleksandrit»	22	2519
	M/V «Sapfir-1»	24	2458
2009	M/V «Aleksandrit»	55	-
2010	M/V «Sapfir-1»	251	3619
2011	M/V «Aleksandrit»	60	3754

The total sample size analyzed is 44102 shrimps, including 12439 in spring and 31663 in autumn.

General results obtained in the course of monitoring of pink shrimp populations from fishing vessels.

- Distribution

- The correlation between the catches of shrimp and water temperature near the bottom

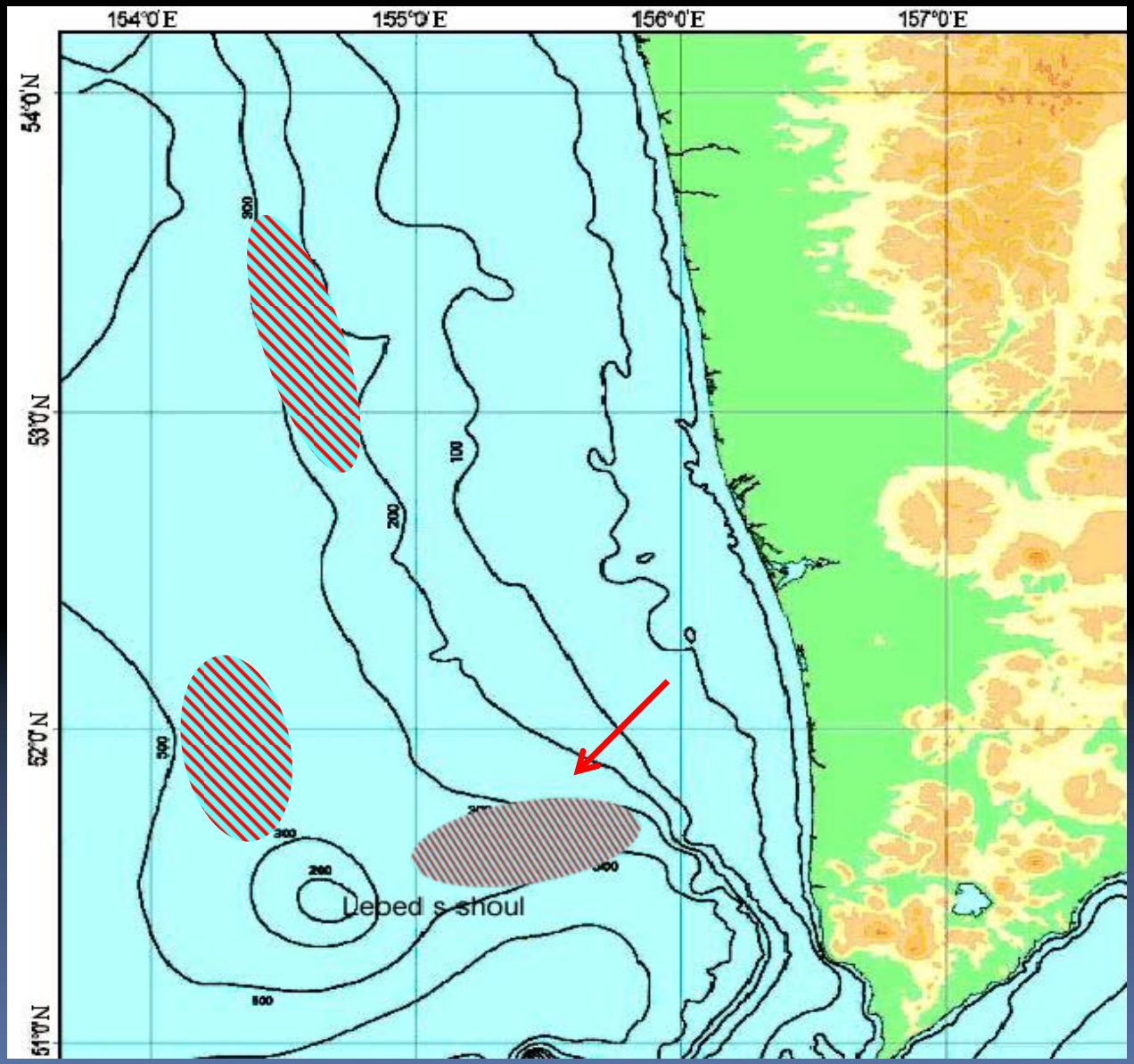
- Correlation between vertical distribution and functional condition of females

- The size ratio in the population

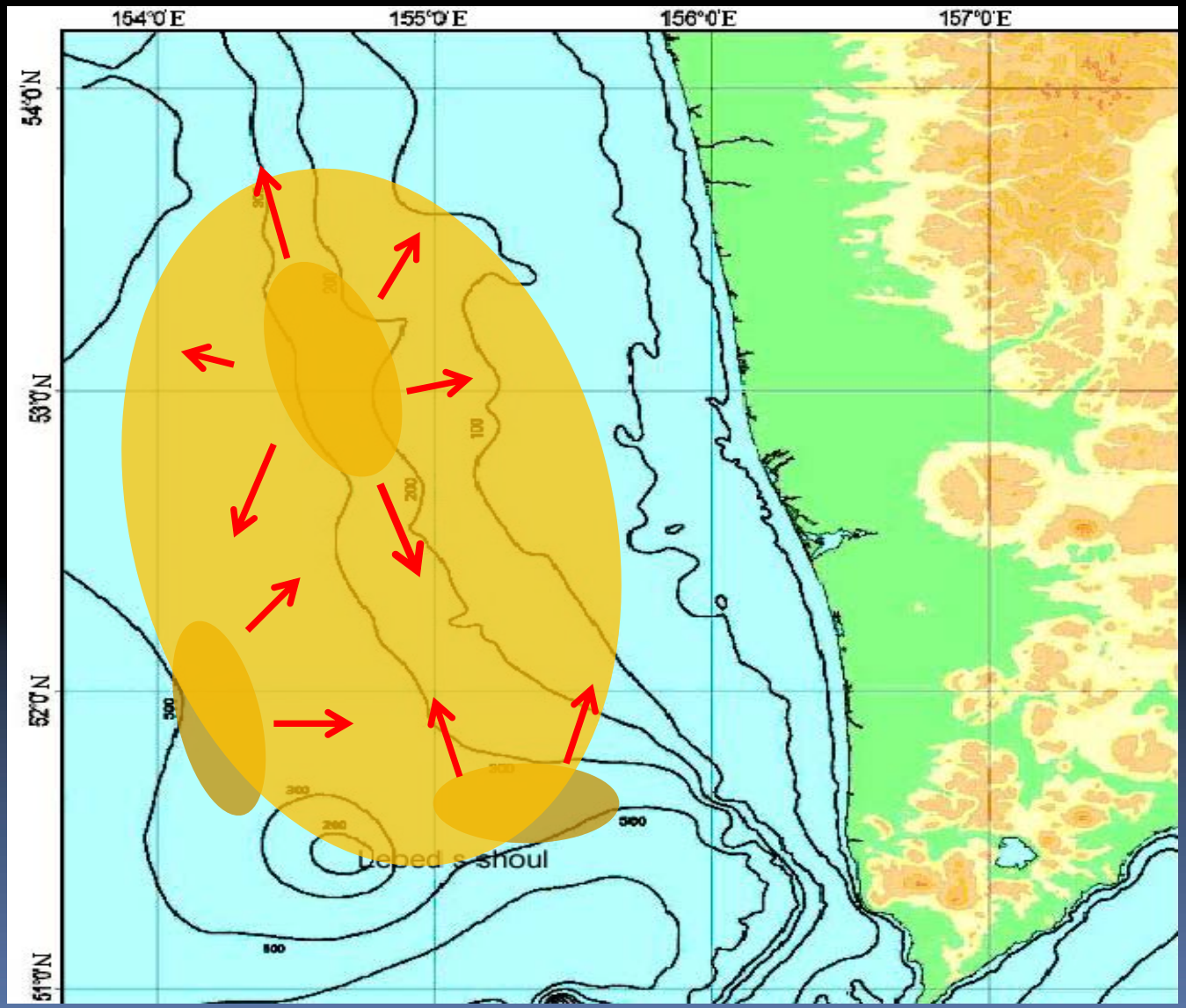
- Age structure of the population

etc.

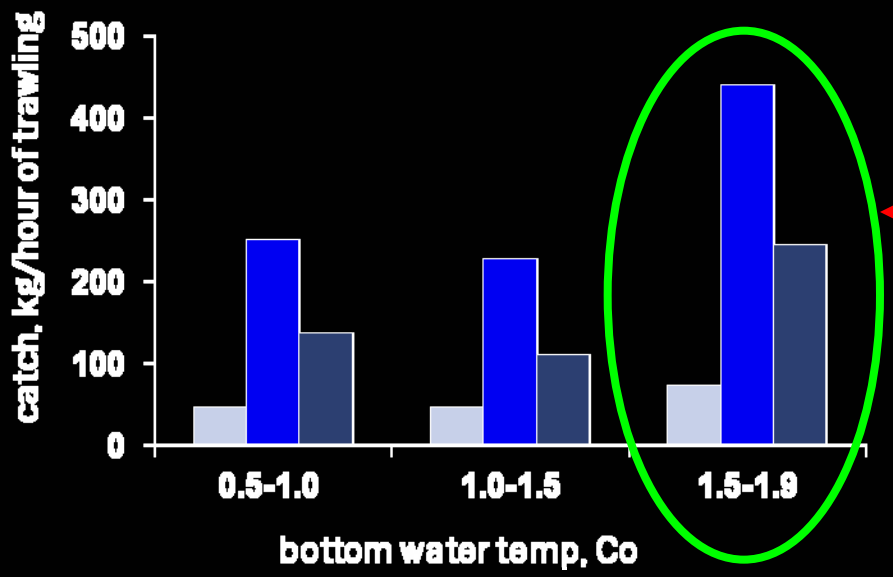
The aggregations of pink shrimp near the south-west coast of Kamchatka



The distribution of pink shrimp in spring-winter and autumn periods near the south-west coast of Kamchatka

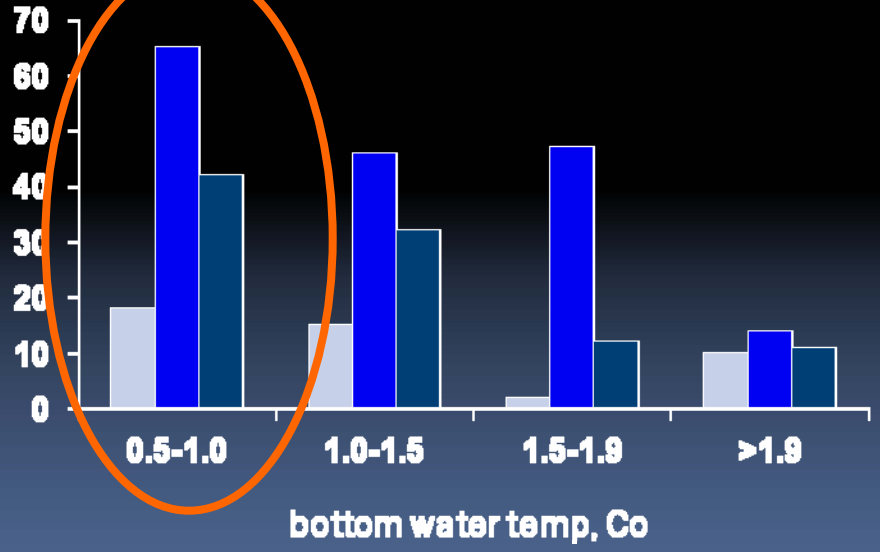


The catches of pink shrimp in different temperature ranges



on spring data

on summer-fall data

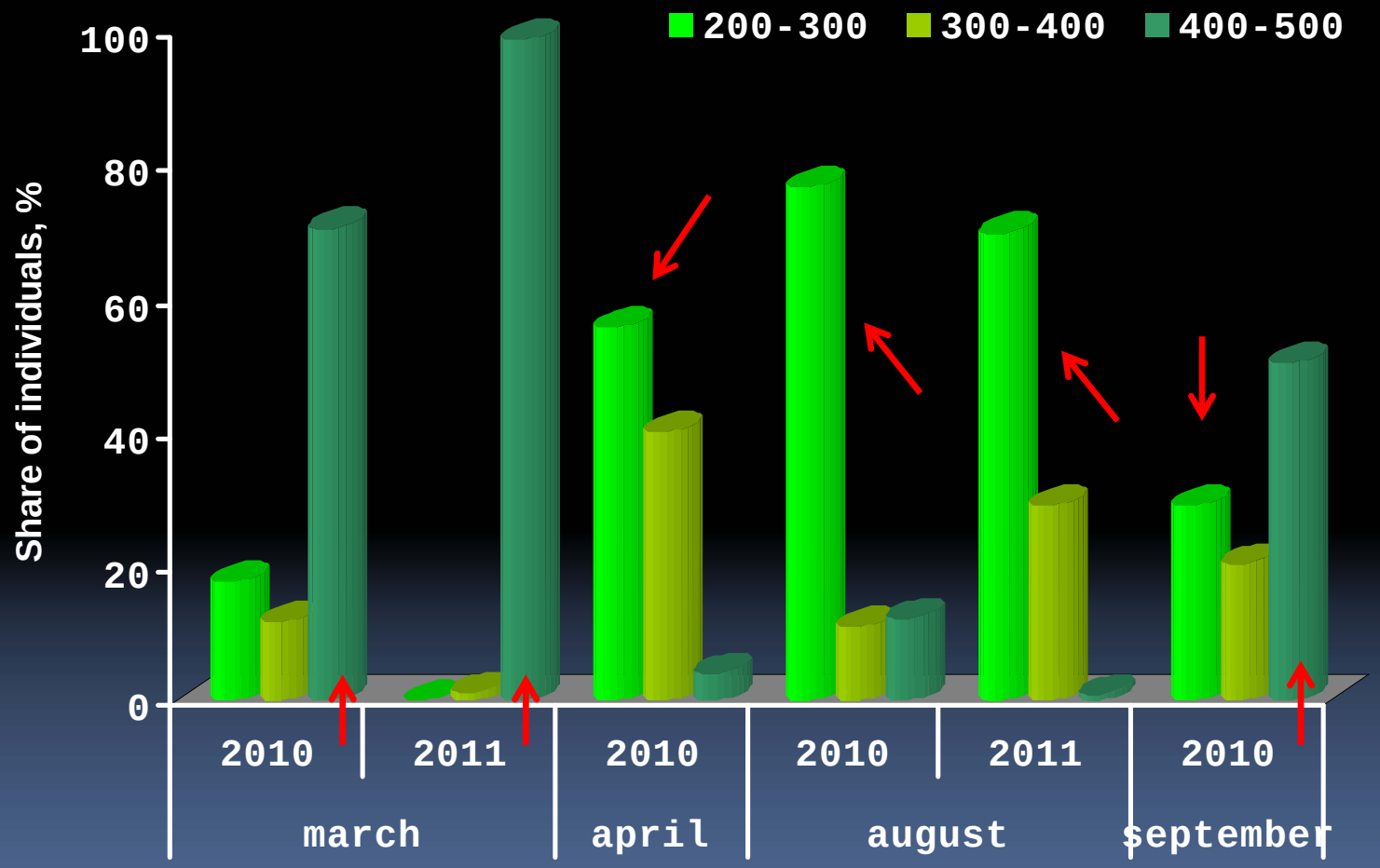


Minimal catches

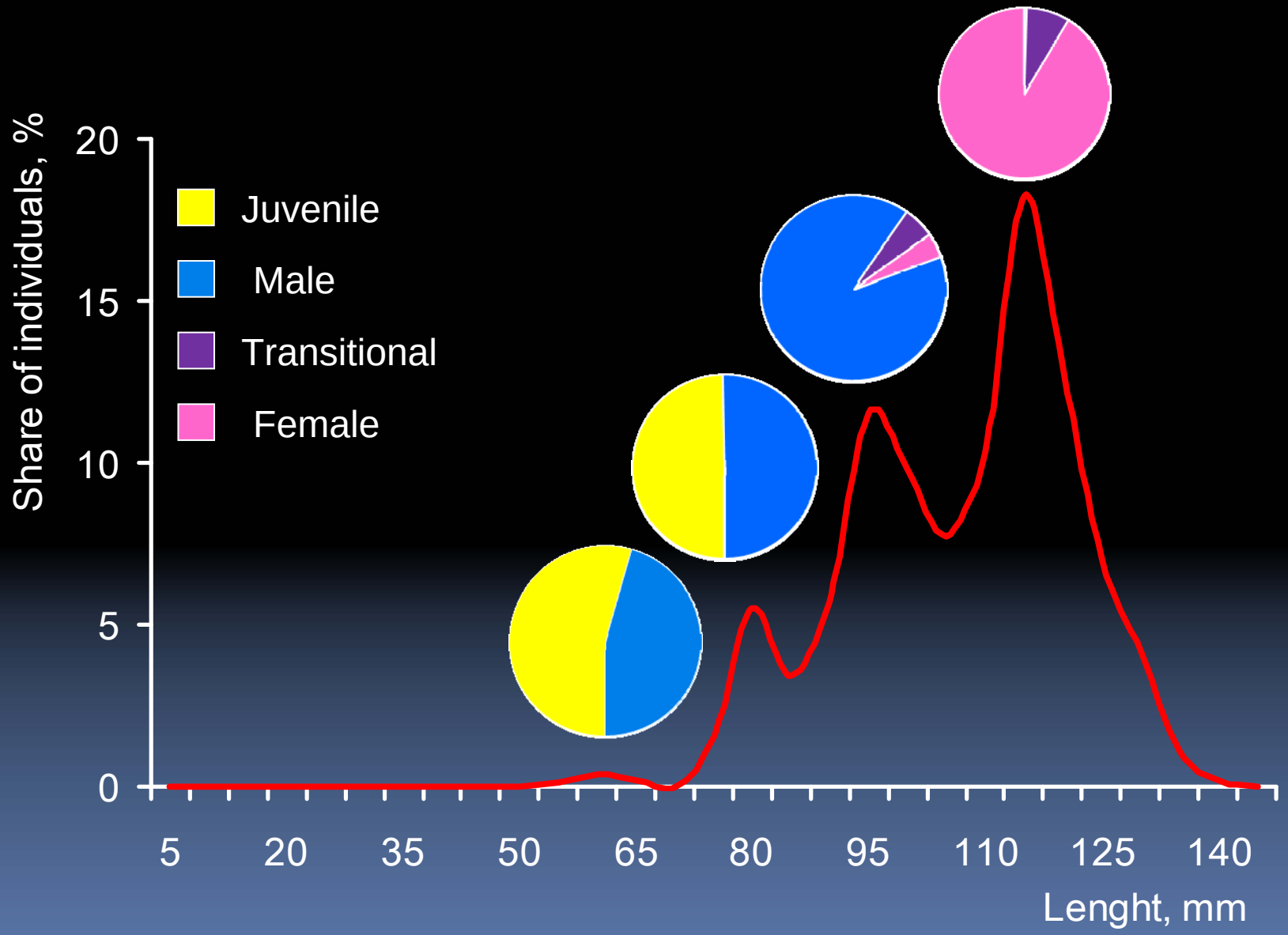
Maximal catches

Average catches

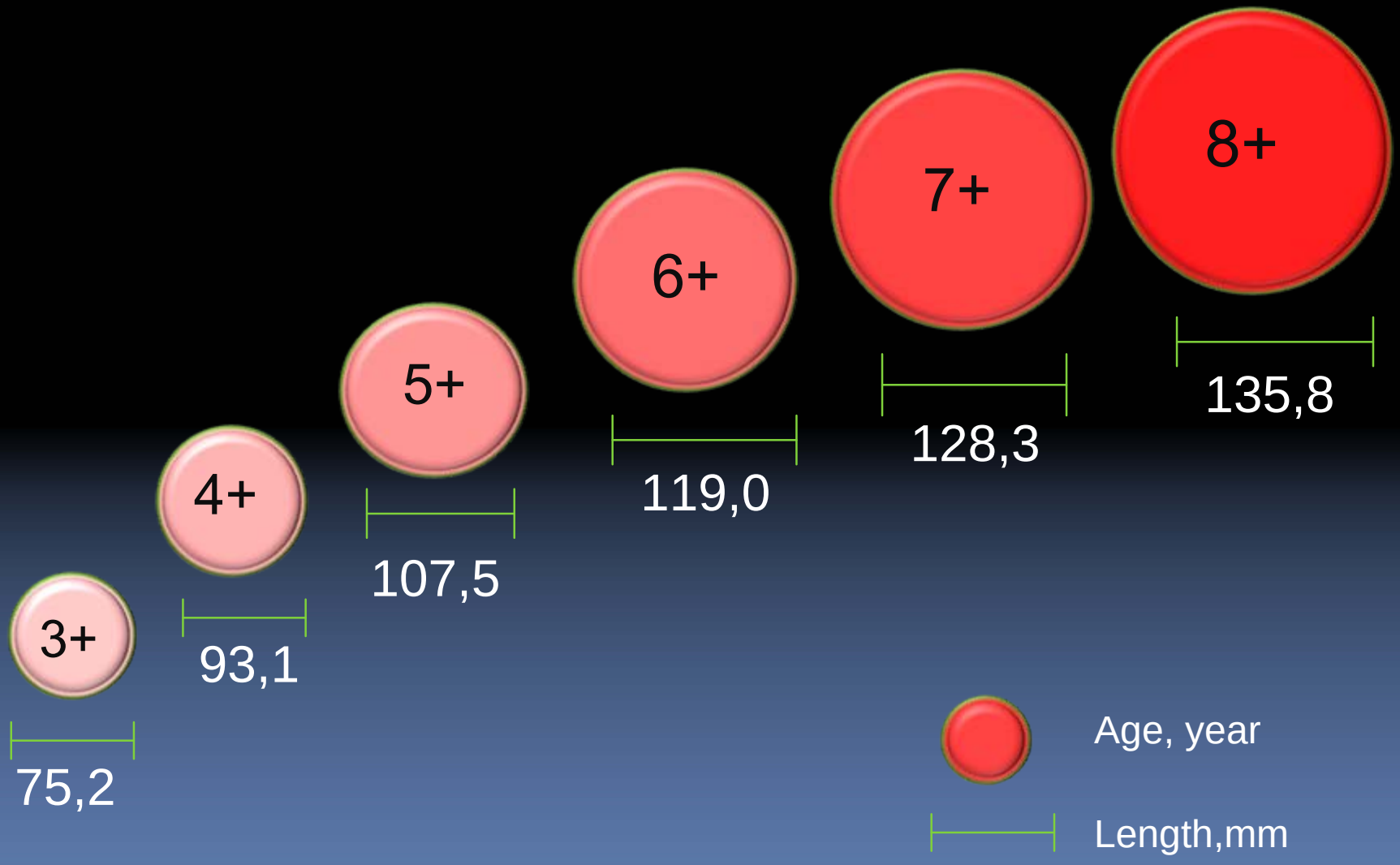
The distribution of female pink shrimps depending the depth and season



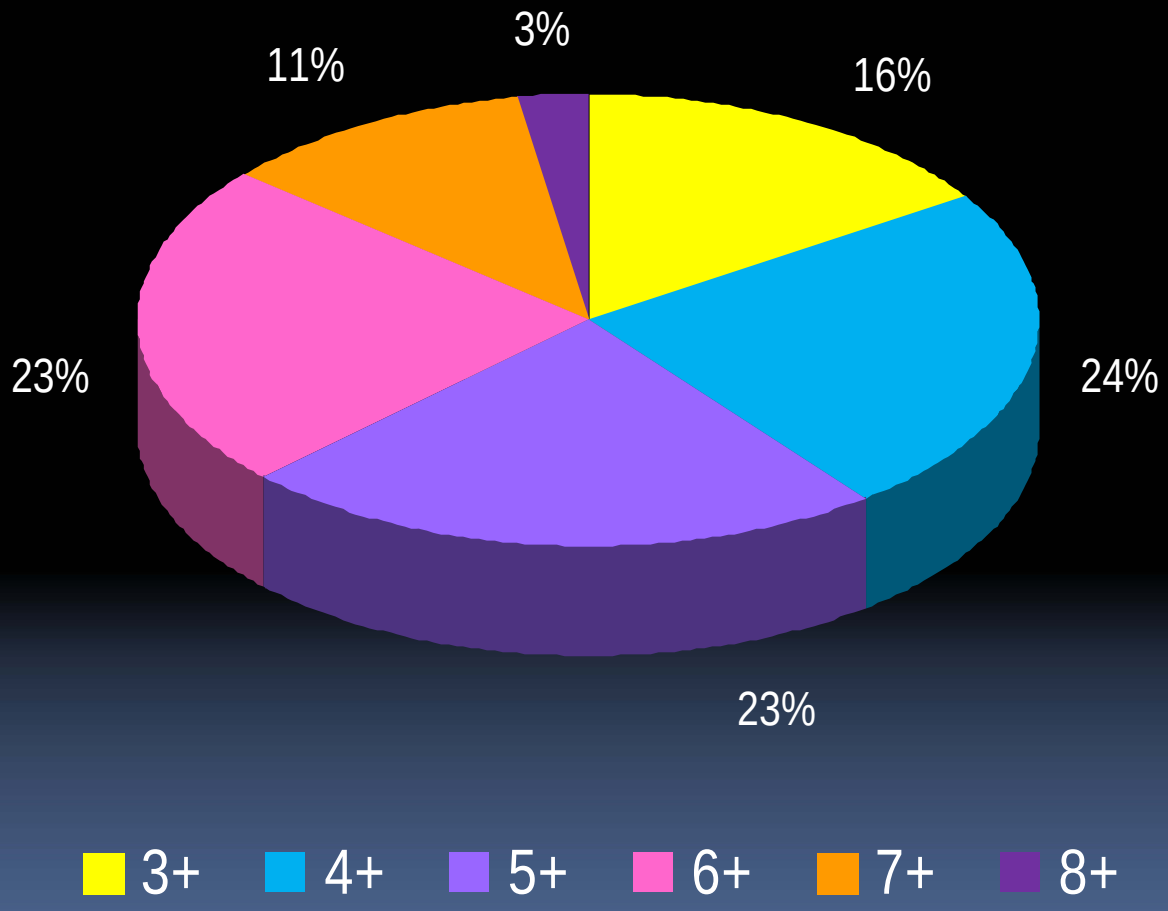
The ratio between different functional groups in the population in the course of maturation of pink shrimp



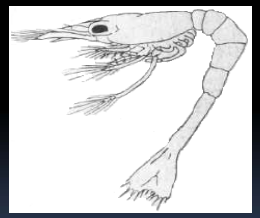
The size-age composition of pink shrimp in the catches near the south-west coast of Kamchatka



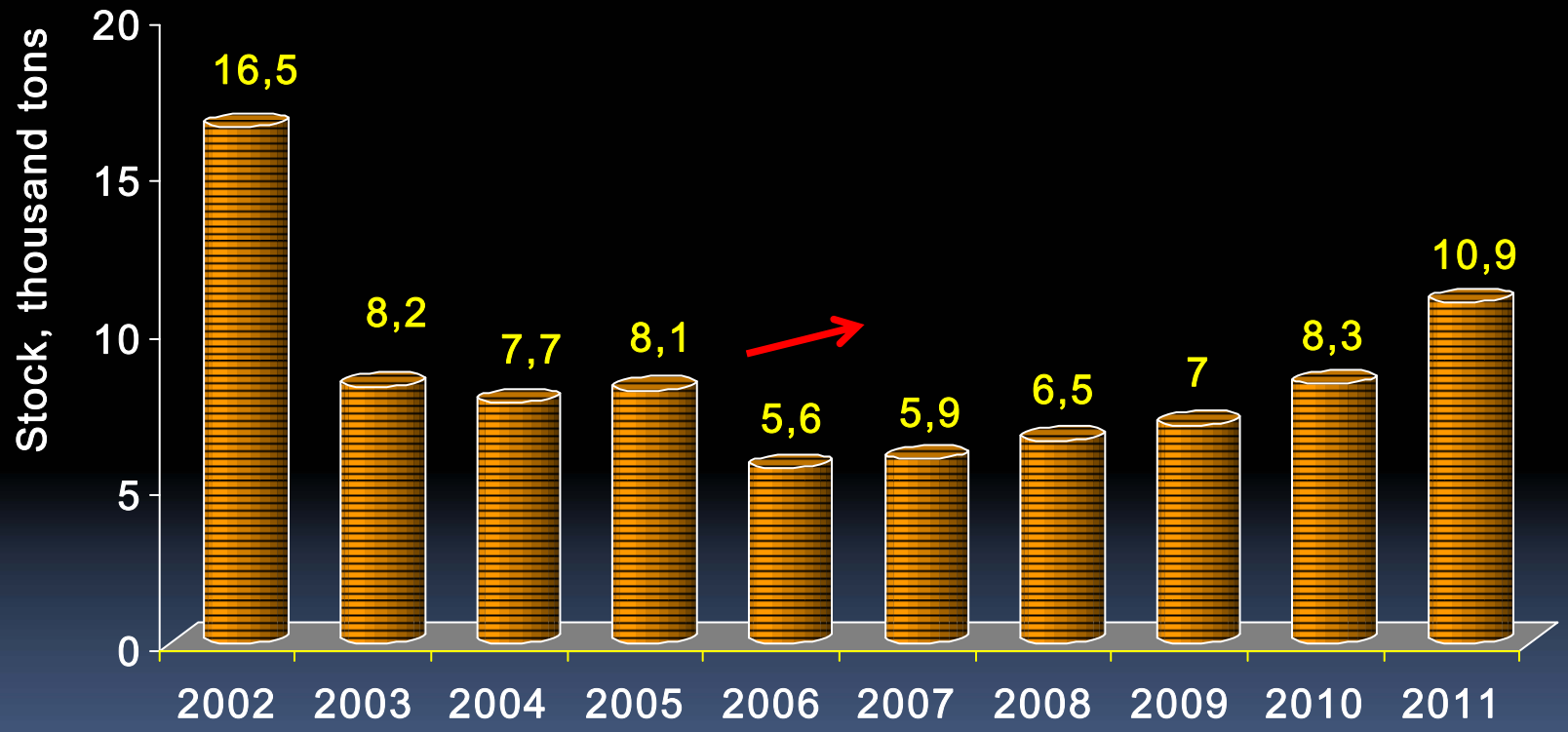
The ratio between different age groups of pink shrimp in the catches near the south-west coast of Kamchatka



Schematic life history of pink shrimp near the south-west coast of Kamchatka

3 – 4 month	0+ 1+ 2+	3+ 4+	5+	6+ 7+ 8+
Larval	→	→	→	Female
	Juvenile	Male	Transitional	

Stock abundance dynamics of pink shrimp in Kamchatka-Kuril subzone in 2002-2011 on the data obtained on commercial fishing vessels



Pros and *cons* of pink shrimp monitoring from commercial fishing vessels

Cons	*Pros*
The time of data sampling is limited	To get information about ecology and biology of the shrimp
There is no a stable scheme of sampling	To get information about hydrology
The area of observation is limited due to narrow interests of commercial fishing	To analyze several commercial characteristics
	To have a huge biostatistical data pool
	To get basis data for the forecast

Thank you for your attention