

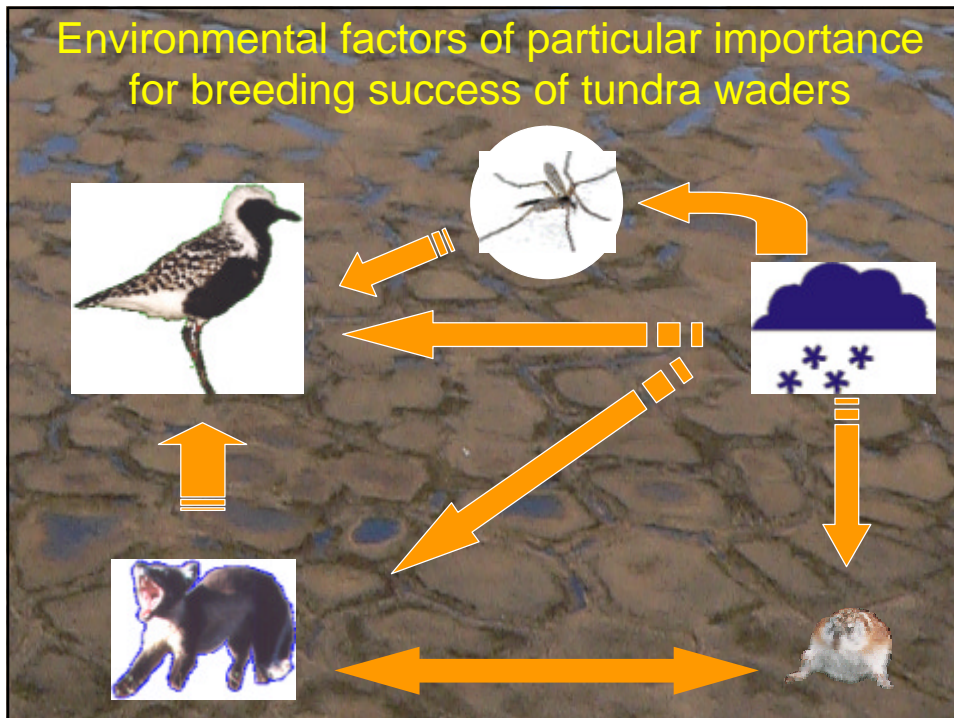
# FACTORS AFFECTING BREEDING SUCCESS OF WADERS IN SIBERIAN TUNDRA



M.Y. Soloviev

*Lomonosov Moscow State University*

## Environmental factors of particular importance for breeding success of tundra waders



## Principal components of breeding success in birds

- ✂ Portion of females in population laying eggs
- ✂ Clutch size
- ✂ Clutch survival
- ✂ Chick survival

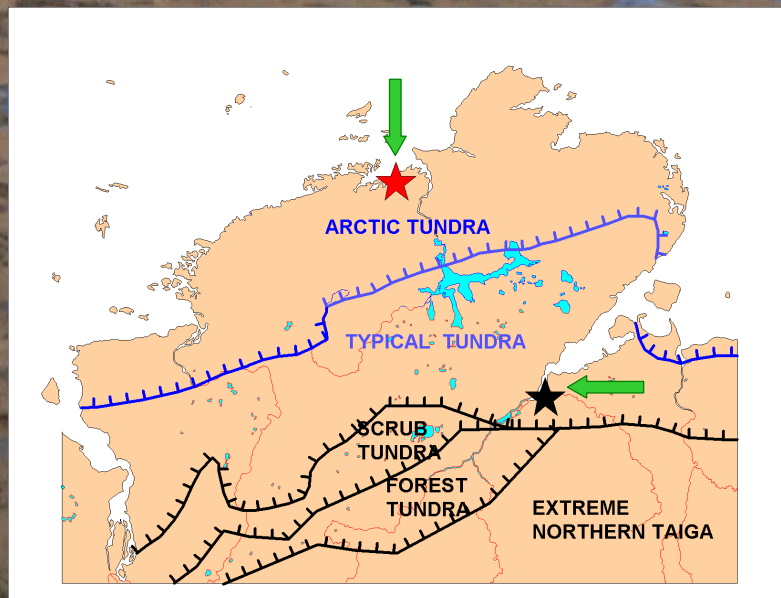
## Evaluation of wader breeding success at different stages of reproduction and at different spatial scales





Our research has been aimed at comparative analysis of factors affecting nest success of waders in different tundra subzones, and factors affecting productivity of populations at a scale of their breeding ranges in the north of Siberia

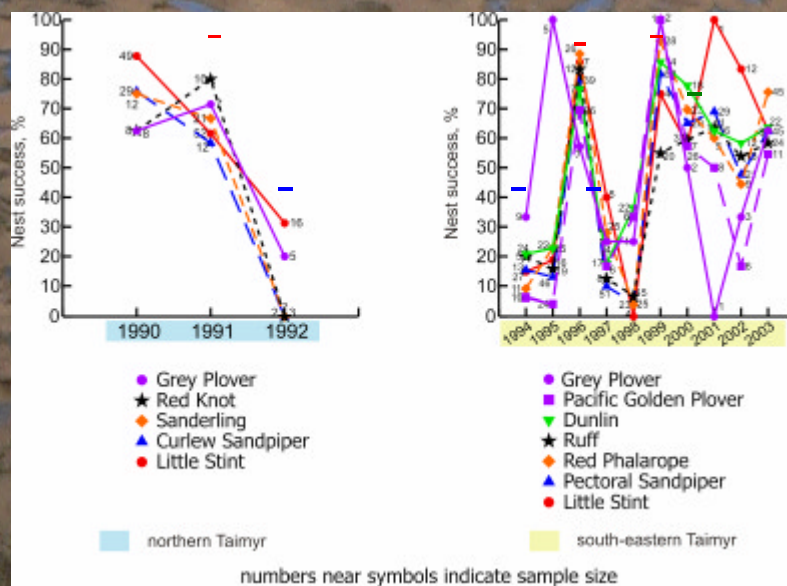
### Study sites on Taimyr



## Data sources for analysis of population breeding success in the north of Siberia:

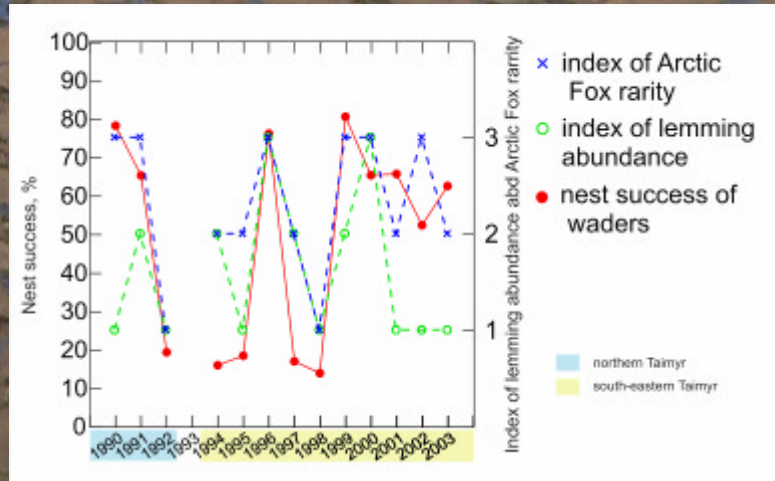
- ✂ **Abundance of rodents, predators and breeding success of waders in the Arctic**  
– Arctic Birds Breeding Conditions Survey  
(<http://www.arcticbirds.ru>)
- ✂ **Climatic data**  
– WMO via National Climatic Data Center (USA)
- ✂ **Juvenile proportions on wintering grounds**  
– Victorian Wader Study Group  
(south-eastern Australia, Minton et al. 2002)

## Nest success of waders: between species differences

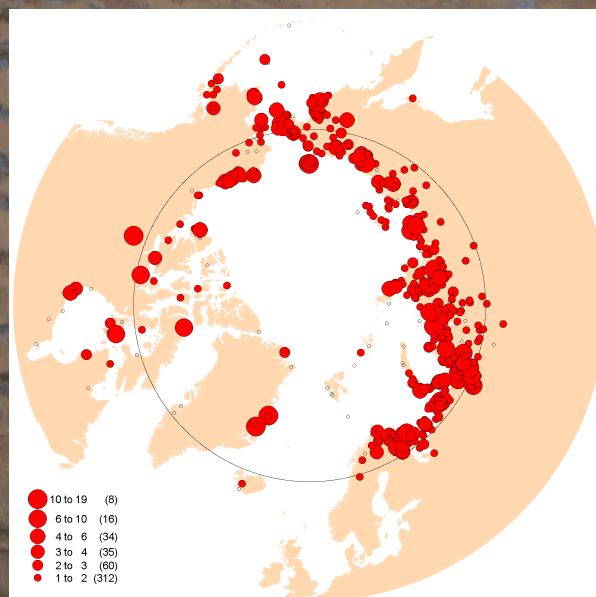




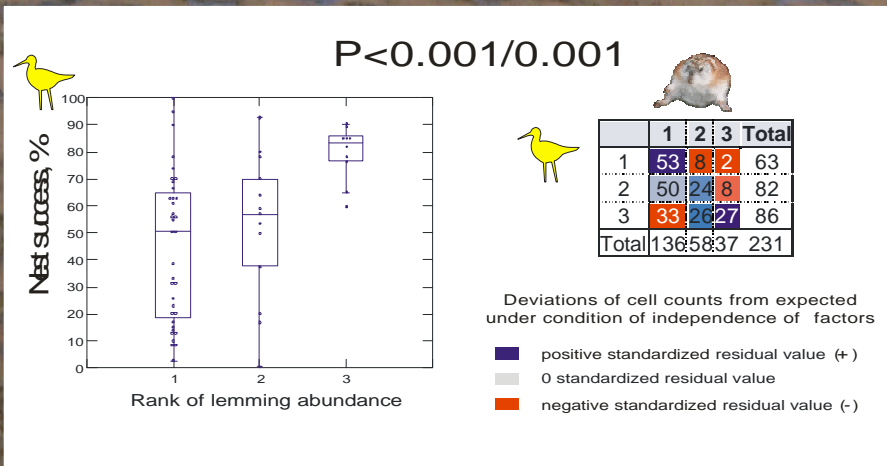
## Nest success of waders: local dependence on abundance of rodents and predators



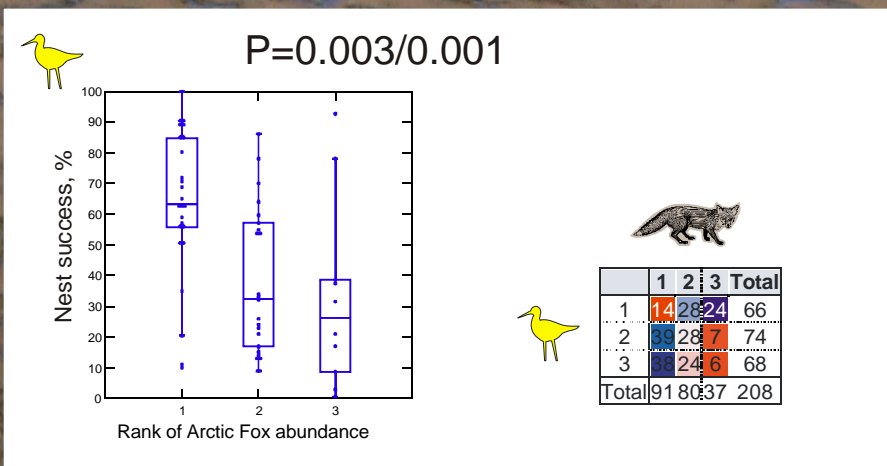
## ABBCS data



## Nest success of waders: “global” dependence on rodent abundance

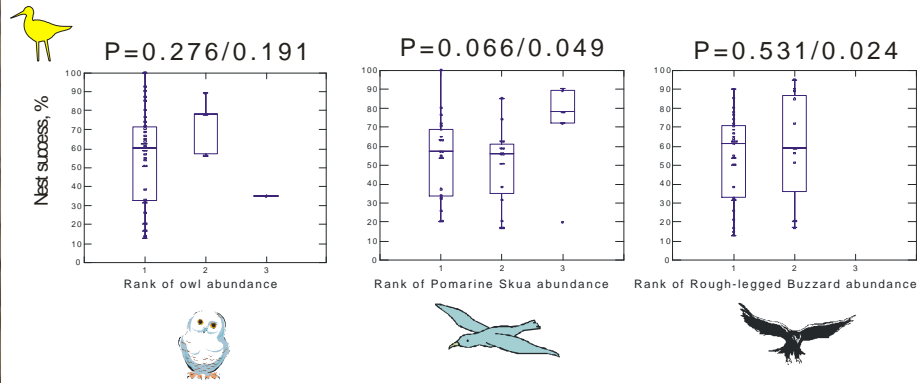


## Nest success of waders: “global” dependence on Arctic Fox abundance

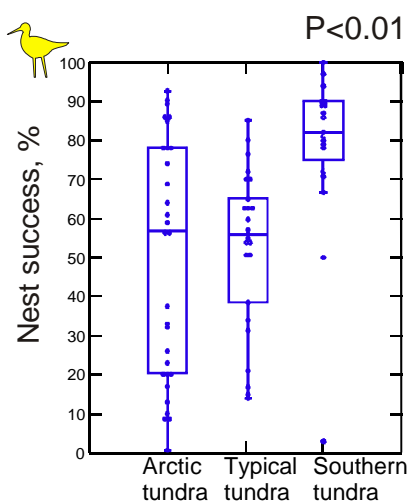




## Nest success of waders: “global” dependence on abundance of avian predators



## Nest success of waders: difference between tundra subzones



### Tundra subzone

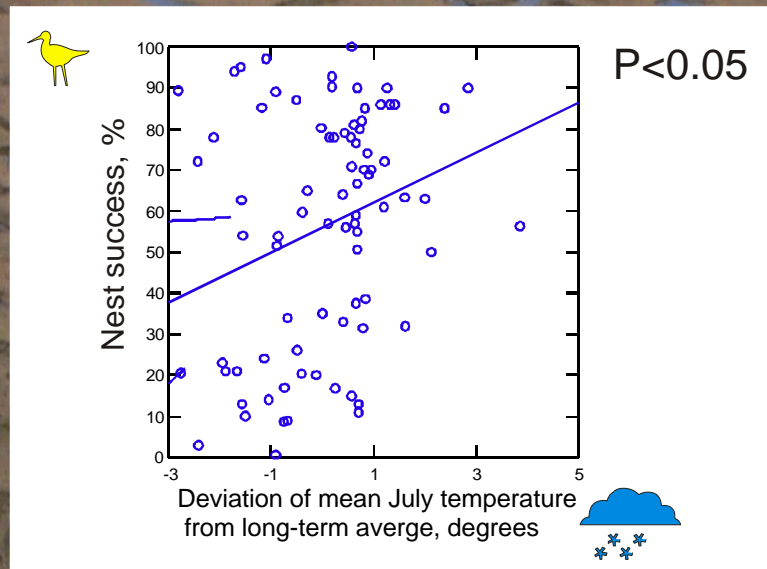
	AT	ST	TT	Total
1	54	57	41	152
2	19	19	58	153
3	22	8	28	56
Total	152	84	125	361

$P < 0.001$

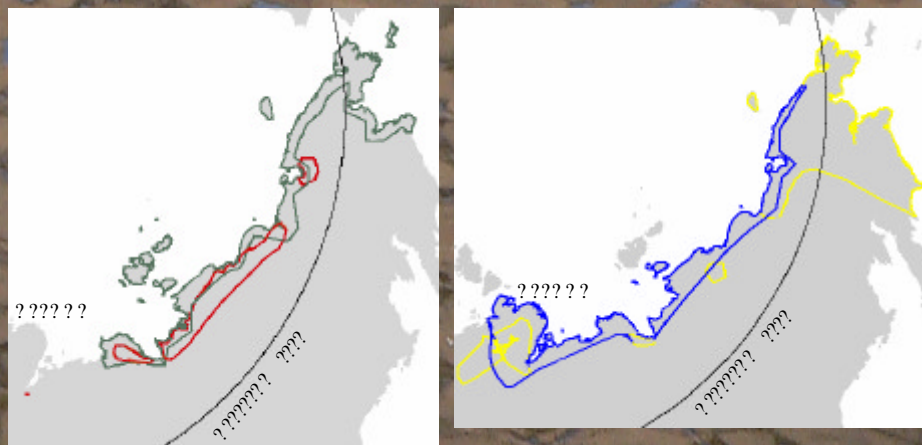
	AT	ST	TT	Total
1	92	83	83	248
2	61	19	39	119
3	33	14	26	73
Total	186	106	148	440

$P = 0.026$

# Nest success of waders: “global” dependence on weather



## Breeding ranges of populations using East Asian- Australasian Flyway



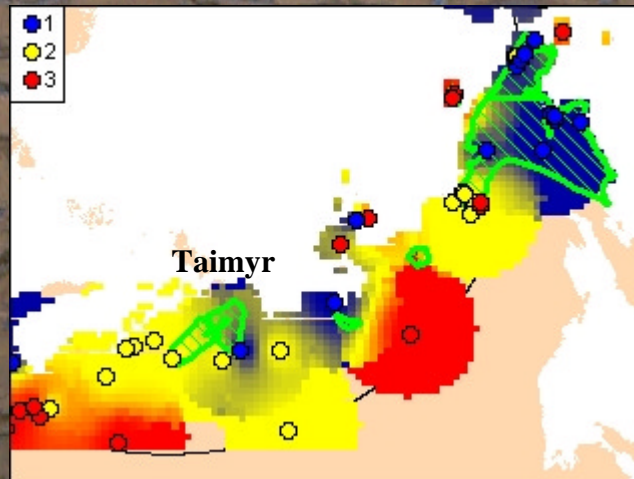
- |  |   |
|--|---|
| <span style="border: 1px solid green; padding: 2px;"> </span> Turnstone            | <span style="border: 1px solid blue; padding: 2px;"> </span> Curlew Sandpiper   |
| <span style="border: 1px solid red; padding: 2px;"> </span> Sharp-tailed Sandpiper | <span style="border: 1px solid yellow; padding: 2px;"> </span> Red-necked Stint |



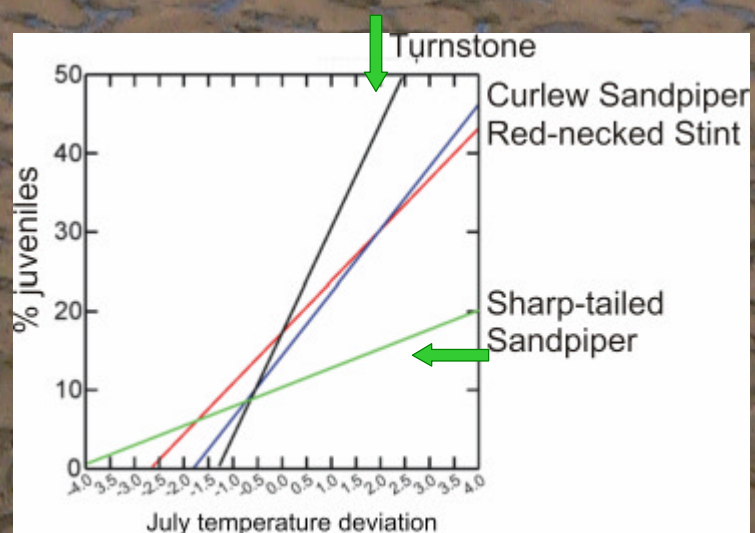
Data processing example:  
rodent abundance in 2002 across breeding  
range of the Red-necked Stint

Rodent abundance:

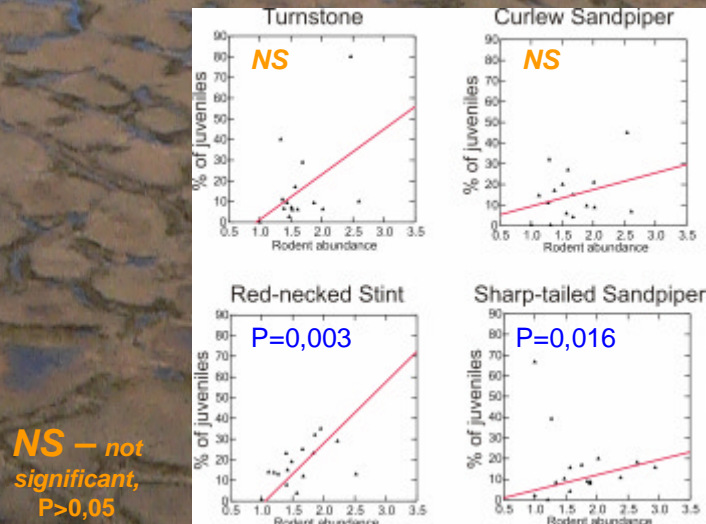
low → 1  
average → 2  
high → 3



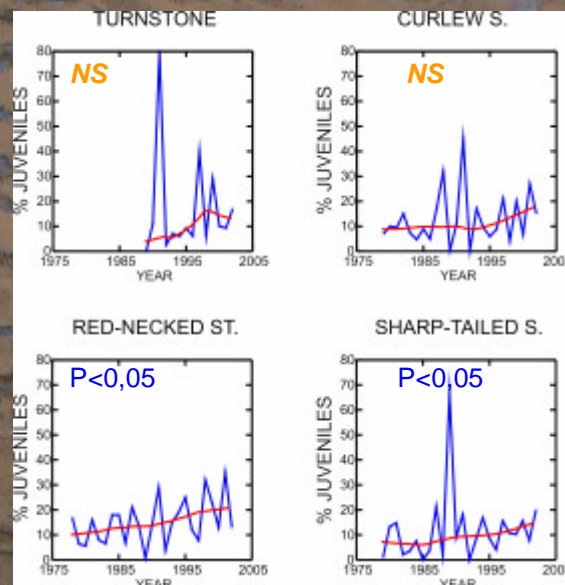
Breeding production:  
dependence on summer temperatures across  
breeding range. Regression lines shown.



















## Breeding production: dependence on rodent abundance across breeding range



## Trends of breeding production in waders





Summary					
Scale and focus					Zone
Local; nest success	NS		NS	NS	NS
“Global”; nest success			 NS		
Population; breeding success	 NS	-	-	 	-
 $P < 0.001$  $P < 0.01$  $P < 0.05$					



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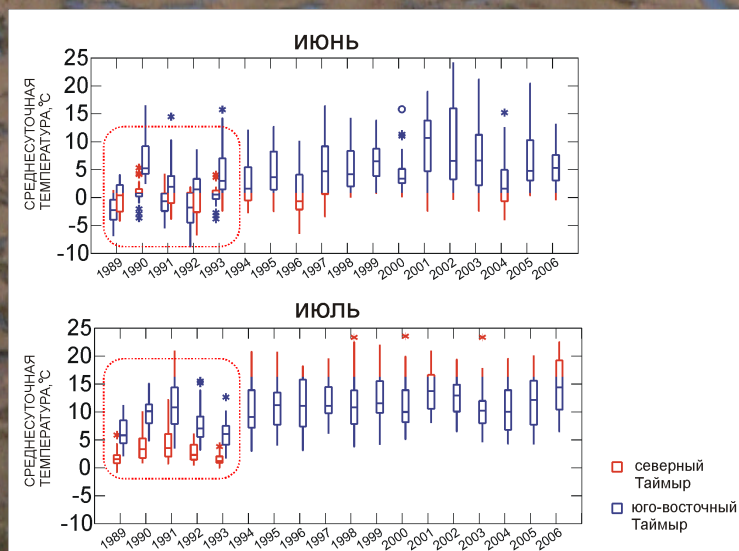
	AT	ST	TT	Total
1	2	43	21	66
2	8	40	23	71
3	0	23	7	30
Total	10	106	51	167

P=0.088

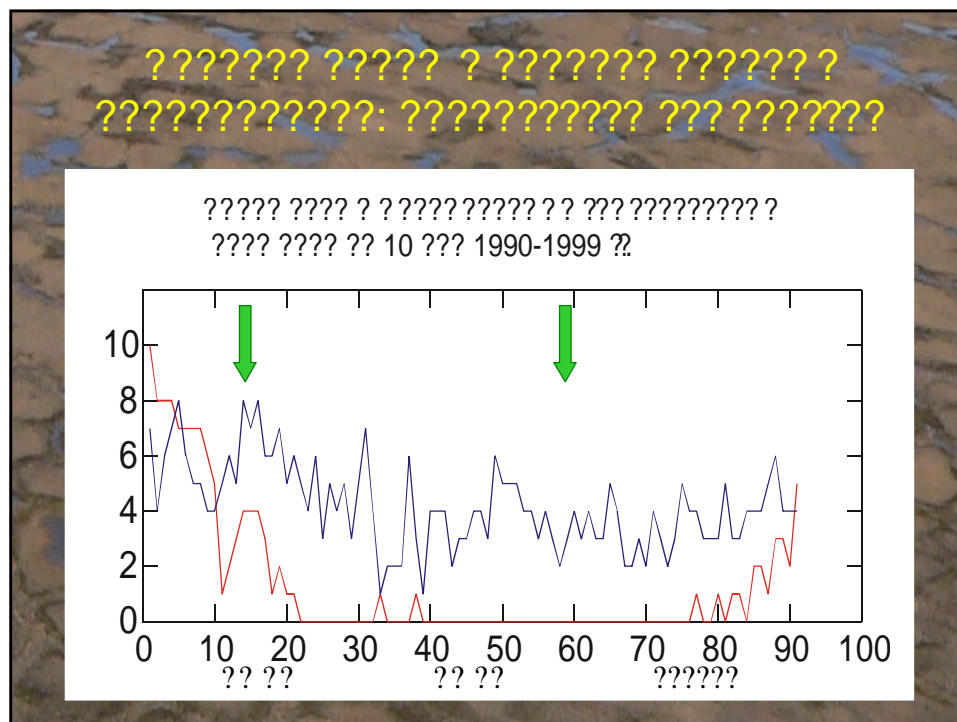
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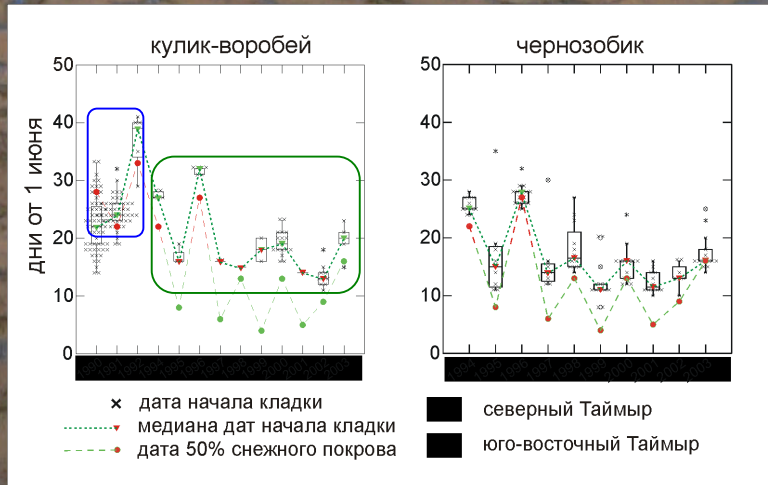


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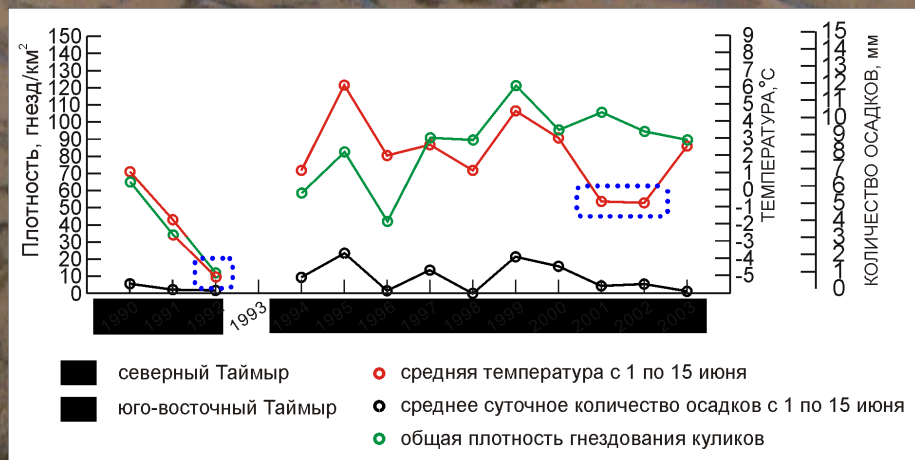
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??????? - <i>Calidris alba</i>	36	19	88	0	0	0
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????????? - <i>Calidris ferruginea</i>	56	24	82	20	11	17
?????-????? - <i>Calidris minuta</i>	133	66	141	119	101	130
????????? - <i>Calidris alpina</i>	0	0	1	207	173	270
???? ? - <i>Calidris melanotos</i>	0	0	0	377	314	325
??????? - <i>Philomachus pugnax</i>	0	0	0	186	147	83
?????:	281	128	425	1397	1042	1122



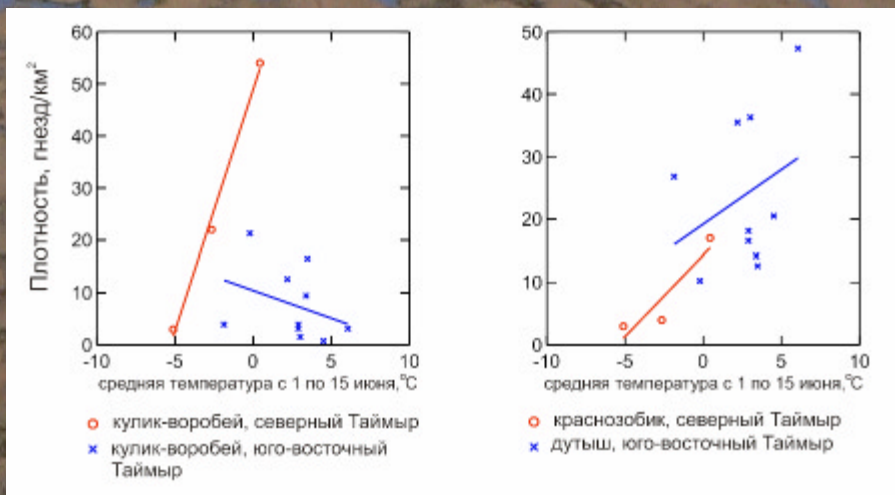
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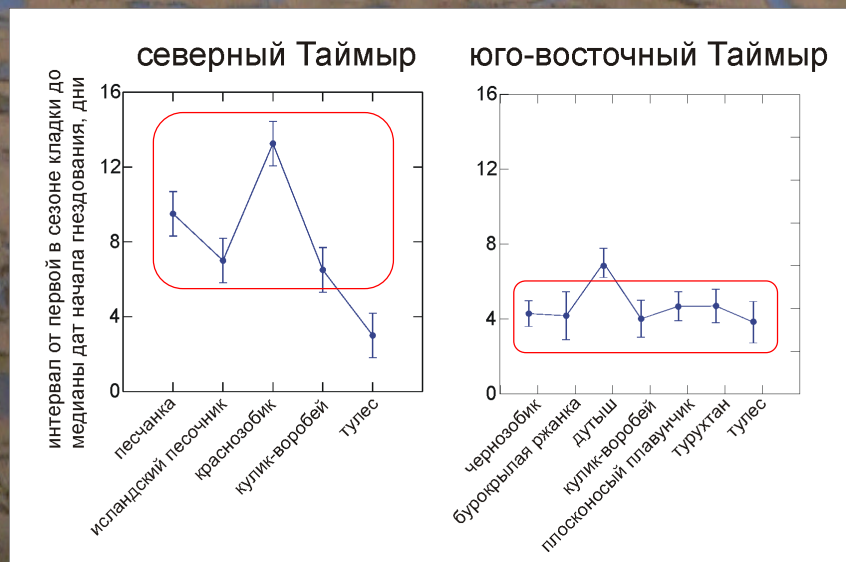
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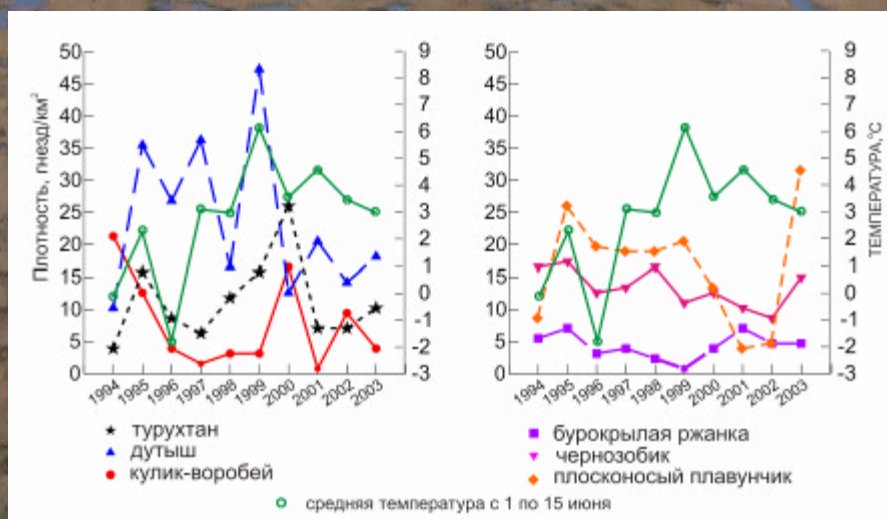
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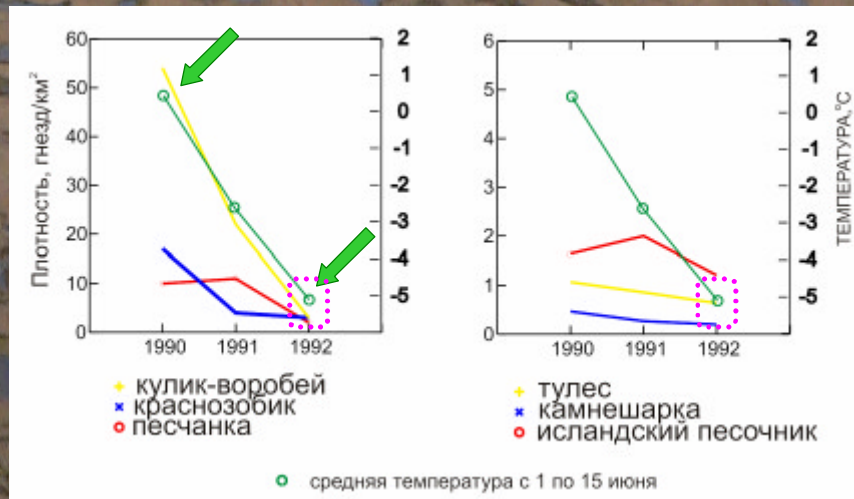


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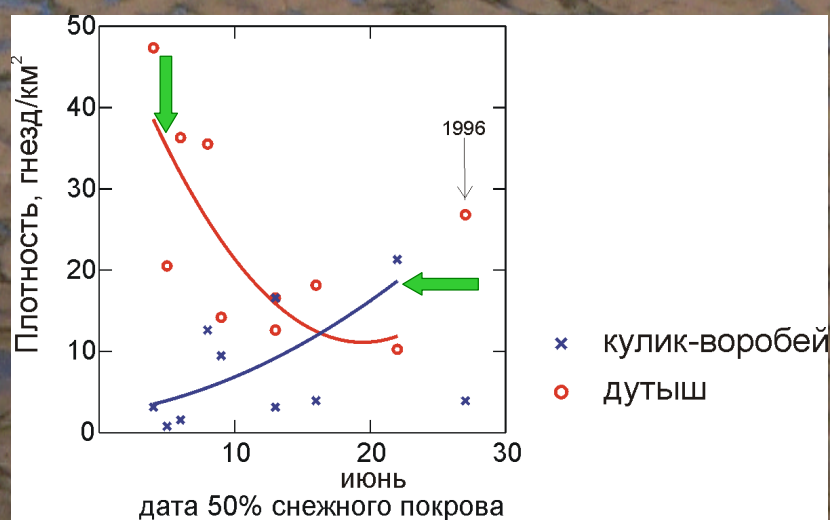




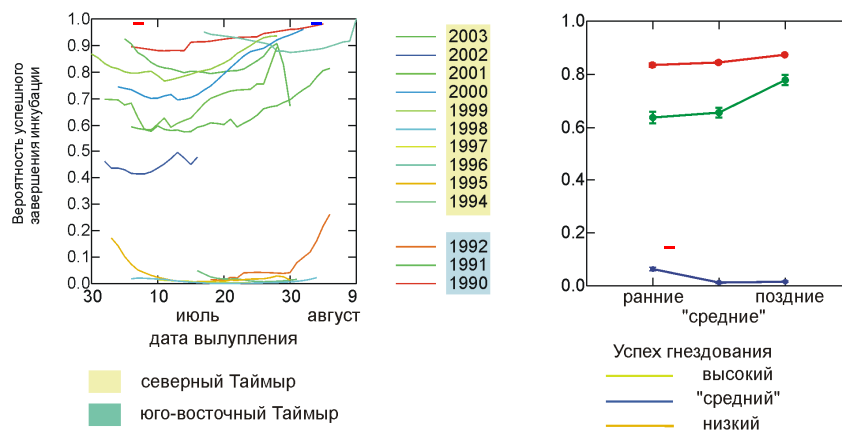
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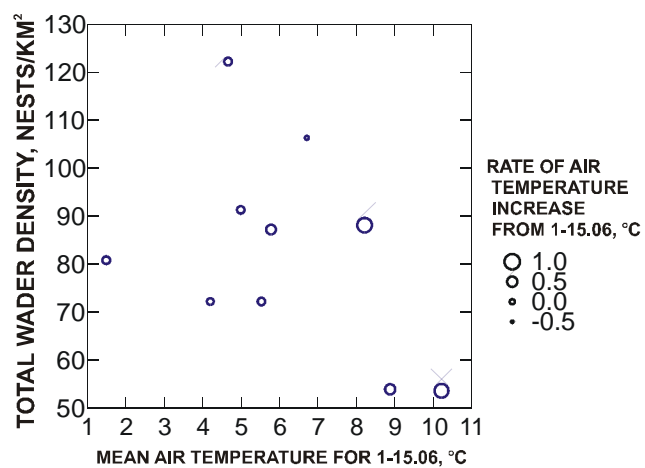
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