∫ j lstsнr qlLzvij dz∫w fnjcts∫ tsэ э j fnj dz.dj?
dзqf Gtt.Oqqf tflsqfq

н j dзOф.∫ ., н ts∫ tsdzsэ ∫ .I .

(ı qtsdzsGqfvij fs∫ Ow fnjsOdzqfw
ñt r вOqf? ò ı R ı t фı)

- ৷ ⊙ʒ৲ʤʒ ʔ ʃʃ ʦʰ⊓ʦʰ ʕ ʃʃʟʒ৲ʲ ʤʃʁ ʷʲ ʤʃʃʤʃʃʤʃʃʃ ʃʒ ʃʃʃʃ ʤʃʃʃ৲ʃʃ ʤʃ⊙৲⊙ʤʃʃʷ ə ʌVIII ə., ʃʃ ʦʃʃʃʤʃʤ ʃʃʃʦʃʃʦ ʕ⊙ʕ ʕ ⊙ʒʤʤʃ ʃʃʤʃʤʤ ʔ ʦʃʃʃʤʃʃə⊙ʤʤʤʃ⊙ʒʕʒ ʃʒ ʃʦʰ ʤʃ⊙ʃə⊙ʤʃʃʤʃʃʒ⊙ə ʃʃʷʲ ʤʃʃʤʃʃʤʃʃʷ, ʕʦʃʃʦʃʦʤ⊙ʷ ʃʃʃʃ⊙ʤʃ⊙ʤʃʃʤʃ৲ʃʤʃʃʦʔ ʦʃʃʃʤʃʃʦʔ ʃʃʃʃʃʃʤʃʤ ʰʦʃə⊙ʤʃʃʷ ʃʃʃʤʃʦʕʦʃə ʃʃ ʤʃʃʦʃʃʃʤʃʤʕʦʕʦʃʃʤʃʤʃʃʷ ʃʃʃʦʃʃʦʃʃʦ

- ⅃ ɘlststɑts? ʧtsɑʌsɘɑʃɑʌ XX ɘ. ɑʌ⊙ʊ⊙ɑʌsfʰj tsʊj tɑj нɑʌsj ɢɑʌsʙ⊙ɑʌ ɑʌsj ʧtslsj ʧɑʌj ɑʌʃj ɟɑʌʃɑʒ⊙ls⊙ɑʌ⊙ɑʌ⊙ʰ j ? ʧɑʌ⊙ɑʌj lsj , ʇtslststɑtsj ʟ⊙ɑʒj lsɑʌs ʧtsɘʳ fɳʃɑʌs ɑʃɑʌsj tɑj fɳʇ ʧtɑtsʙɑʌj ɑʒj ɘɑʌʃʷɑʌʃʷ ʇɑʌʃɑʒ⊙ls⊙ɑʌ⊙ʙɑʃtsfɳʷj tɑʌ ɑʃ, fɳʃstslsɘj lsfɳʃsɘj ɑʌsʌs, ʇʷj ɑʌsɑʌsɢɑʃʊj fɳʇɑʃɑʒɑʌ⊙ʙɑʌʳ нj ɑʌʃʷɑʒ,

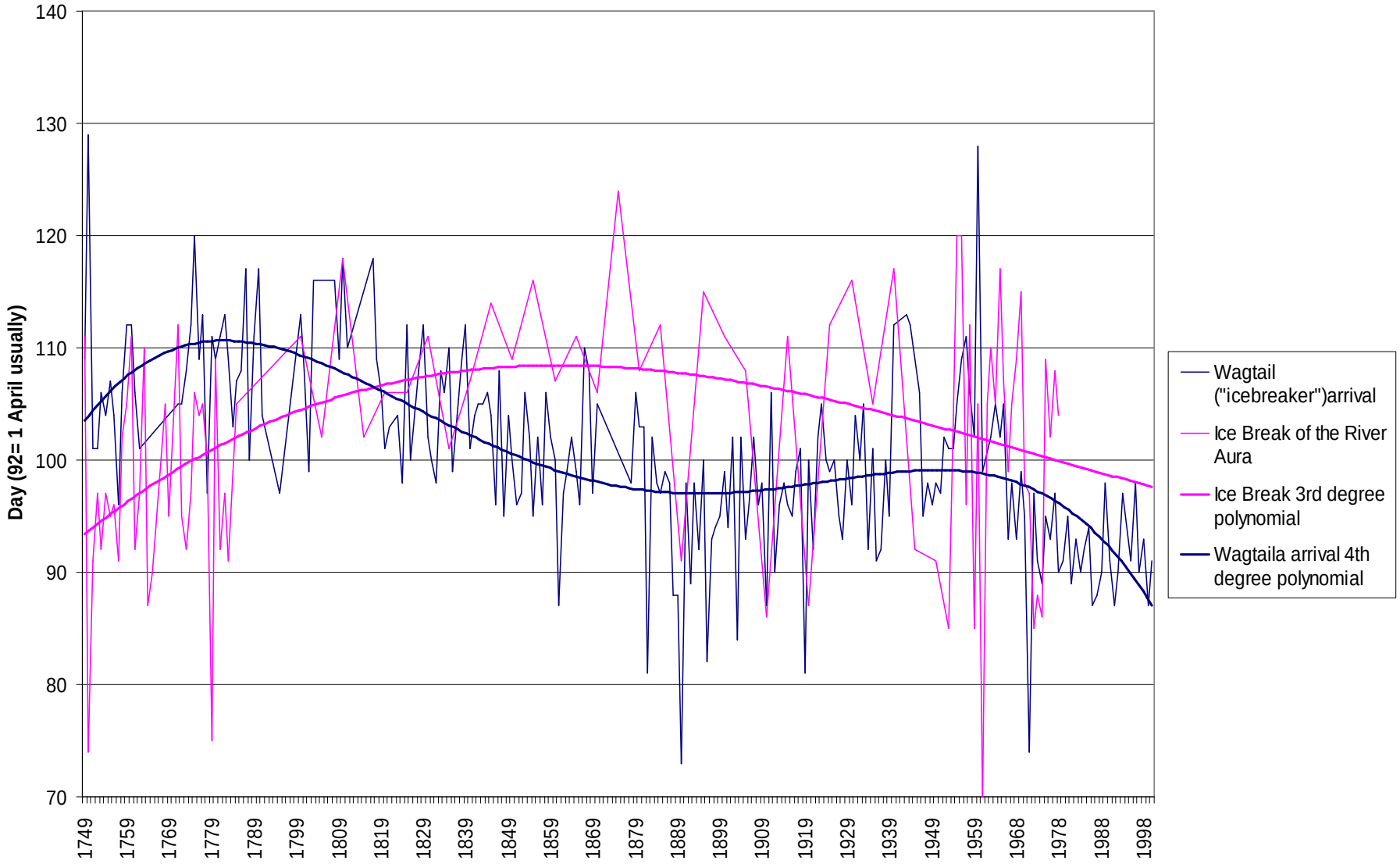
- ⅃ ts ɑʒɑʌsɢɑʃ⊓ fɳʃstɑ⊙ɑʌ⊙⊓ ɿ ⊙ʃ⊙нɑʌs? ʃ ɘtɑtsʧʳ ɑʃ ɘ ⊎ j ɘj tɑɑʌs? ɸ ɑʒj tɑʃʇj fɳʃɑtsʇɑʃ ɘj fɳj ɑʌsʌj ? ɑʒʃɑʃɢtɑ⊙ʊɑʃɑʃ ɑʒɑʌsɢɑʃ⊓ ɘɑʃнtsɘ ʧlsɑʃʊ, лɑʃɑʒʌʳ ʰ ɑʃ⊓ ɑʌj lstsɑʌʳ ʇts ɘ ʃ ɘtɑtsʧj , ɑʌs ɑʃ ɘ ɸ ʷʷ tɑʃʇj , fɳʌʰ j fɳʃɘj ɑʌsʌs fɳʃʒj fɳʃsɑʃɑʌʃfʰj ɑʌ⊙ʙtsɑʌj j tɑ⊙ɑʌsʌʃj ʇ⊙ɑʌj ɑʌʜ⊙tɑɑʌʳ j н⊙lsʳ . ʇ lsts ʧtɑtslsɑʃɘtstɑj ʊɑʃls tsʙʰ j ʧtɑʃɑʌʷlsts? ʇtsɑʌʊj ʧʊɑʃɑʃ, ʊlsts ʧj tɑj ɑʌj lsɑʌʳ j ʧlsɑʃʊʳ ɑʃʟ ɢtsн⊙ɘ ɢtsн ɑʌ⊙ʊɑʃɑʌ⊙ʰ ls ɘj fɳj ɑʌsʌʳ ʳ ɑʒɑʃɢtɑ⊙ʊɑʃʳ ɘ fɳ⊓tsнɑʌʳ j fɳʃɑtsʇɑʃ, ʇtslststɑʳ j fɳʃj ʊɑʃʷʷɑʃʊɑʌʳ нɑʌʷ ʇ⊙ʃ нtsɢtsɘɑʃн⊙ɑʃ ʧtstʃʌzɑʌʷʊɑʃɑʃ ɑʃ ɑʌ⊙⊓tsнʷlsfɳʷ ɑʃfɳʇɑʌʳ ʊɑʃlsj ɑʌʳ ɑʌs ʧtsн ʷʷtslststʃj tɑʃtsнɑʃʊj fɳʇɑʃɑʒ ɑʃɑʌʃ ɿ ɑʌsнtsɢj ɑʌsʌʳ ɑʒ ʇtsɑʌstɑtsɑʌj ɑʒ,

Методы регистрации сроков весенней миграции

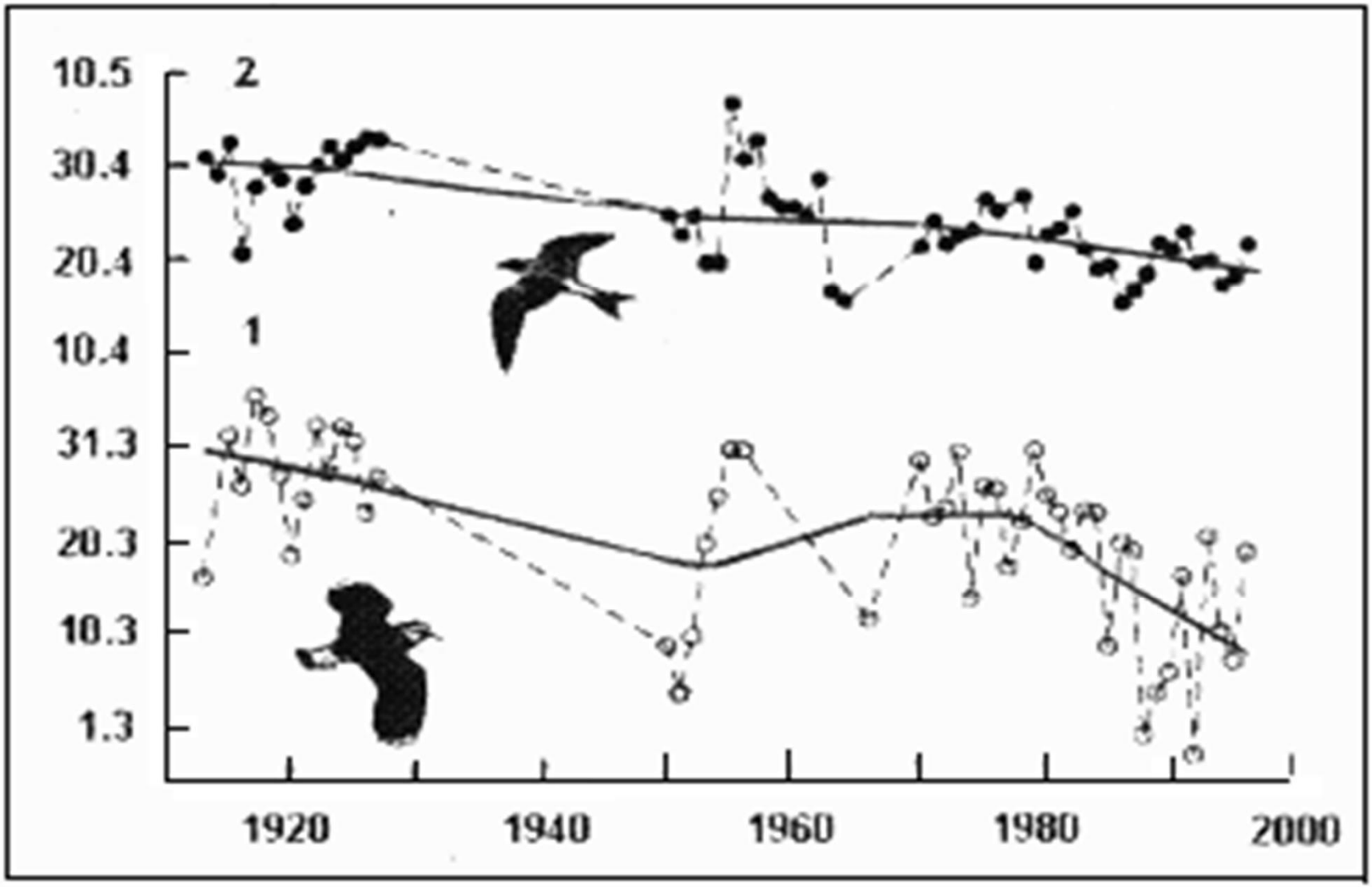
- Л ф[LLZ⊙dZ dx⊙W tej Gф[fhjstе⊙Uqф[W tf tsWеdj dx[W tf j tееr П tf lsф[U е tе⊙P tsdj GdjLHtsе⊙dx[W
- t j Gф[fhjstе⊙Uqф[W tf j tееr П tf tsR h ф П fh⊙dЗUtsе
- ∫ lsdxsе tf lsф[U dx⊙tstеdx[lstsdxsGф[Uj fh[ф П fhs⊙Uqф[tsdx⊙tе⊙П
- Л ф[LLZ⊙dZ dx⊙W tej Gф[fhjstе⊙Uqф[W tslsdj lsOtf lsф[U fhLф[dЗtsеts[
- t j Gф[fhjstе⊙Uqф[W fhjеts[tsе dЗф[Gtе⊙Uqф[ф tf lsф[U fhtf tsdЗsh Л R fhf lZlsdx[[tsеr П tf j tej H⊙lsUqф[[tsе ф Gj tsdxs[⊙lststеtsе

J cfLlzOdz dx/Ow tej gcfflbstaOuqfw tfj tea r =tflsqfu
e taOP tsdj gdj LHtseOdx/qfw

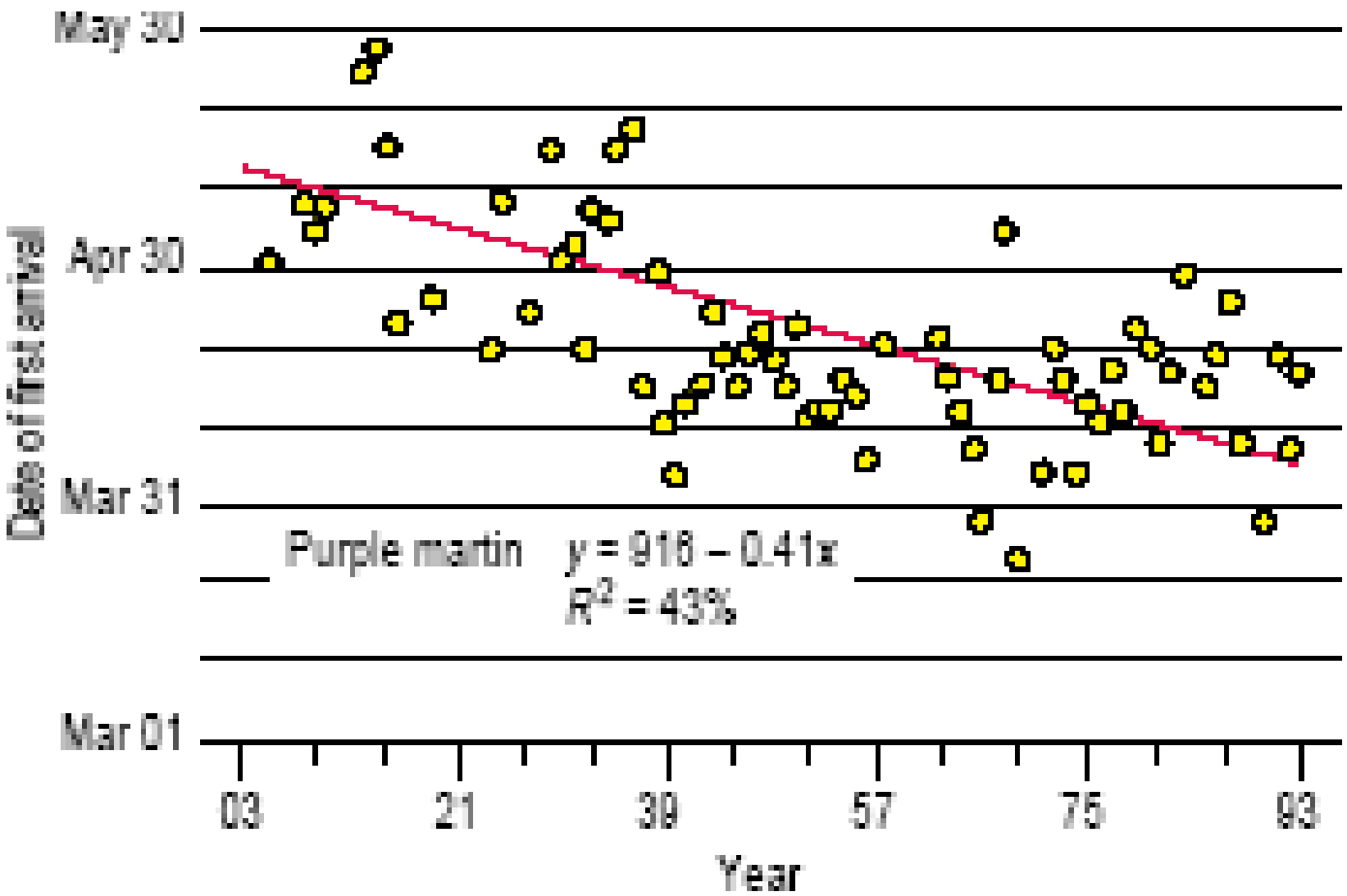
Регистрация первых особей белой трясогузки в Финляндии (Rainio et al. 2015)



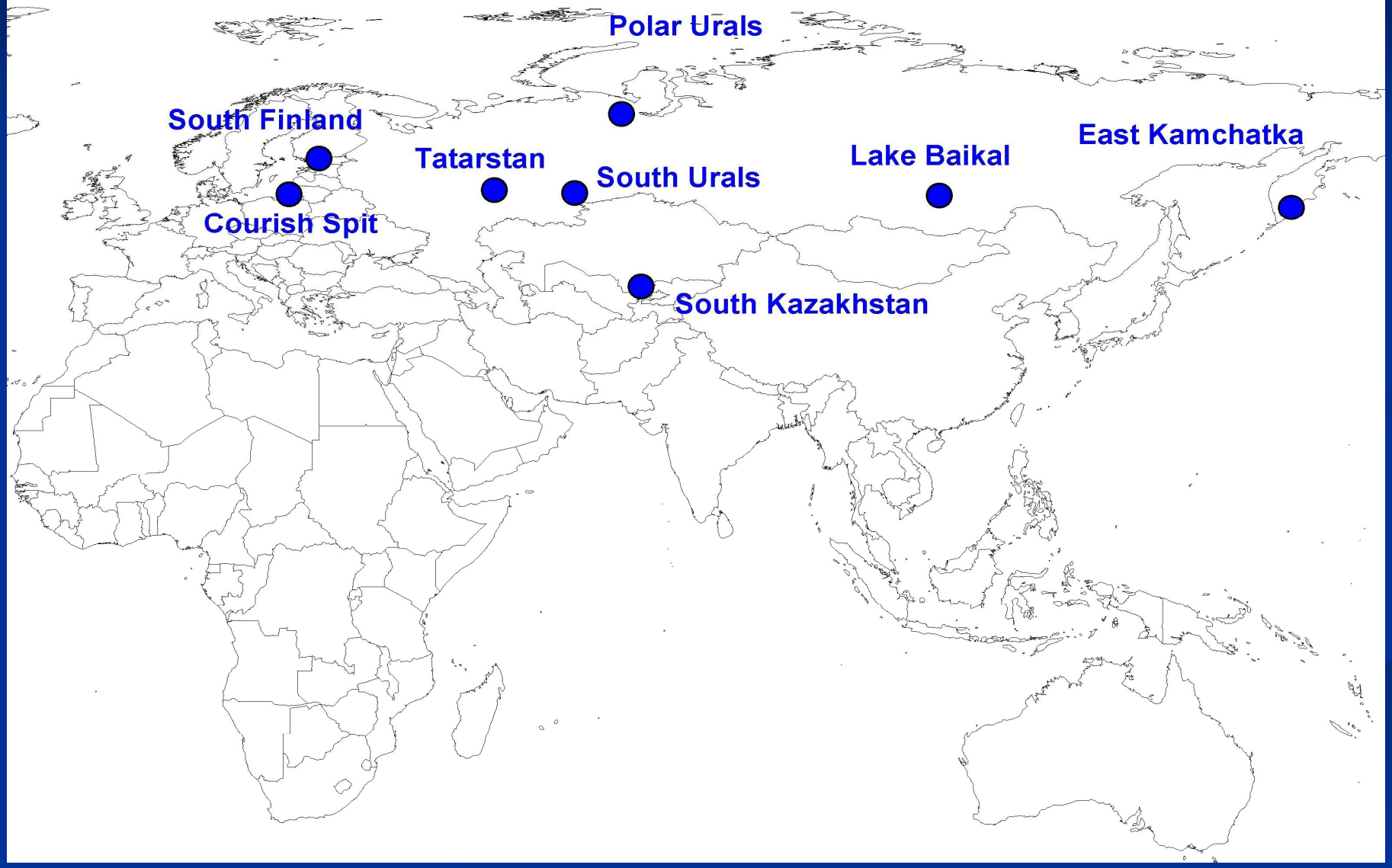
Регистрация первых особей у ближних (1) и дальних мигрантов (2) в Польше (Tryjnowski et al. 2002)



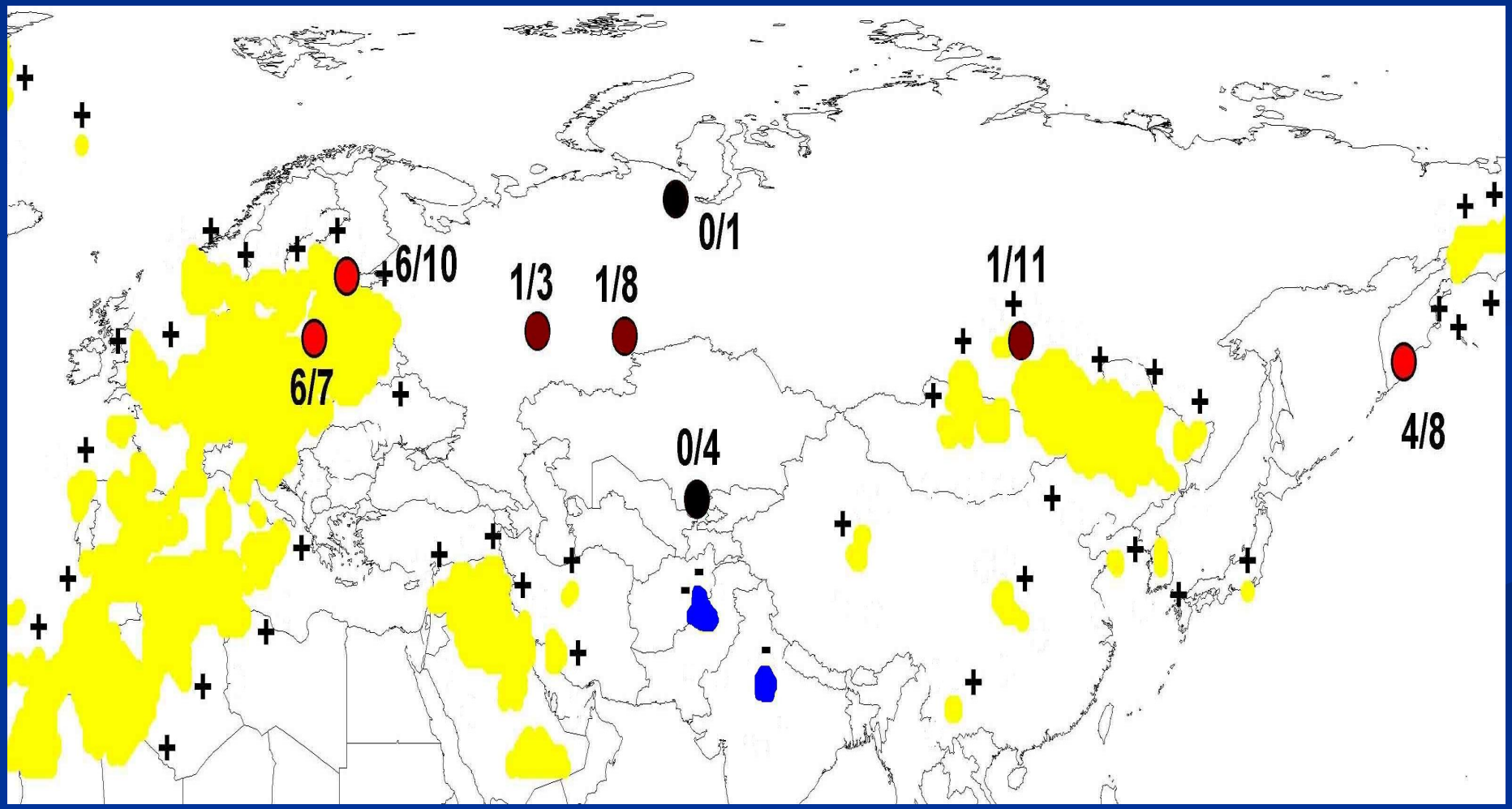
Регистрация первых особей пурпурной ласточки в шт. Нью-Йорк (Oglesby, Smith 1995)



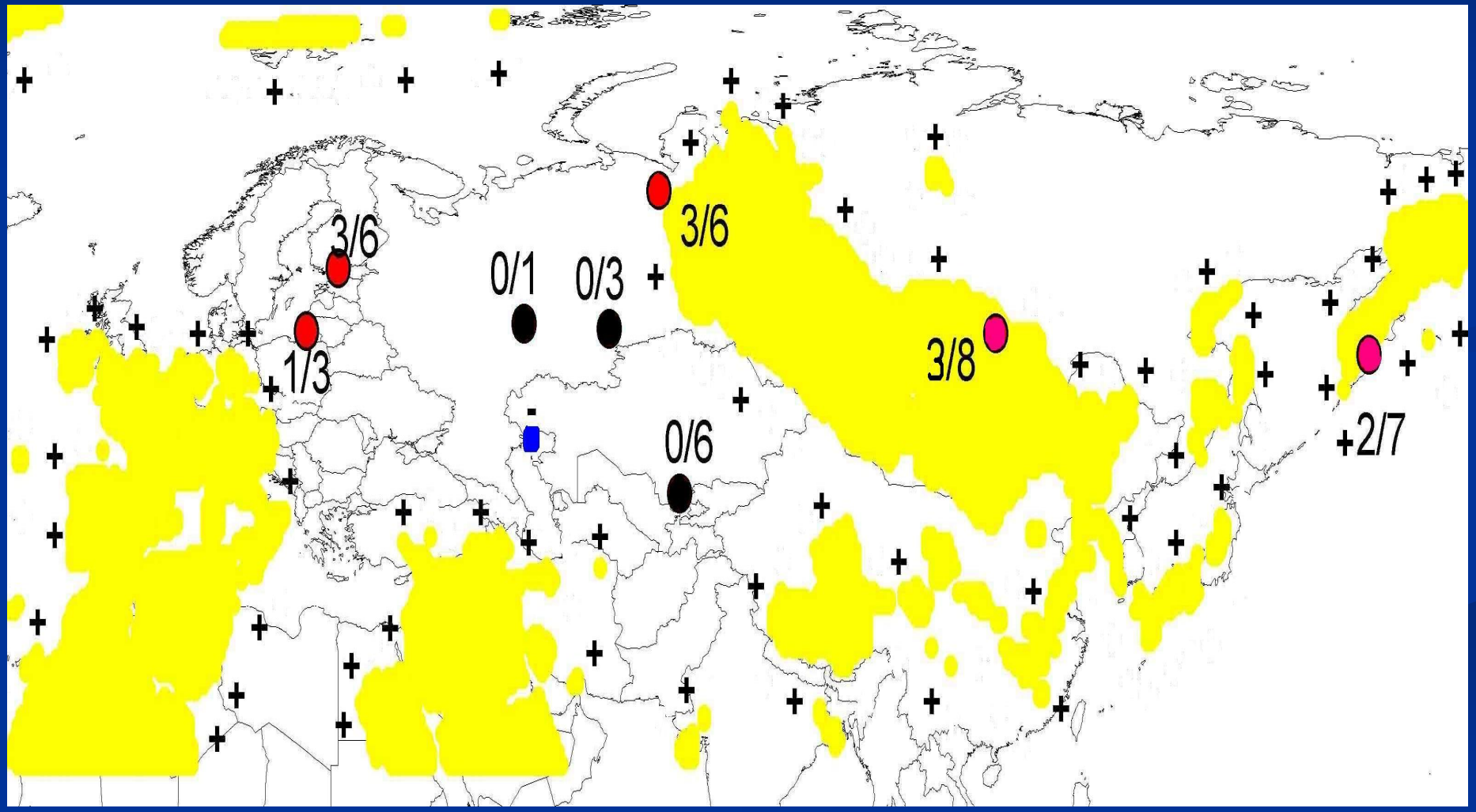
Study regions



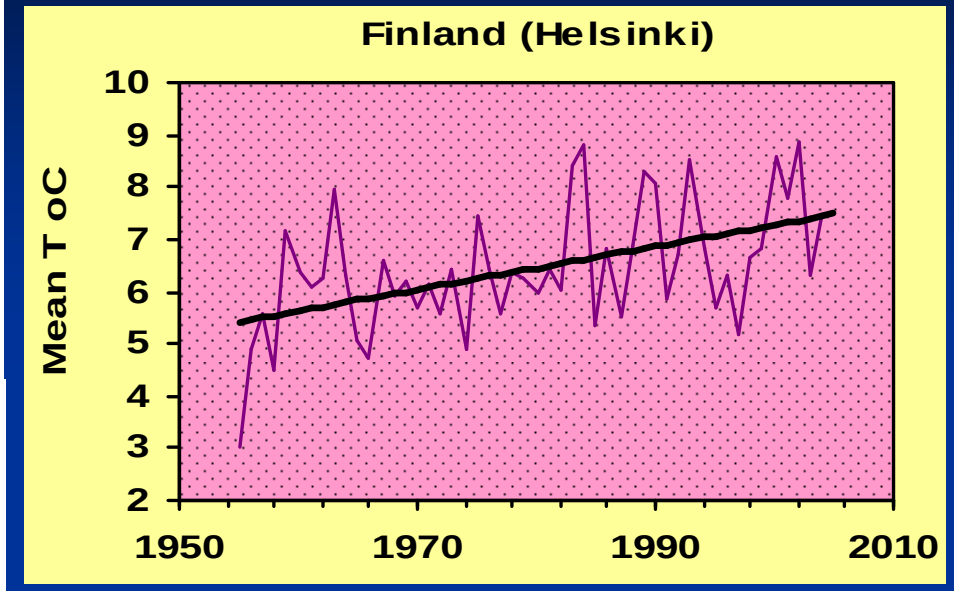
Position of regions (yellow color) which show a significant ($p < 0.05$) increase of April temperature in 1971-2000 (figures – No of earlier arrival species in March/No of species)

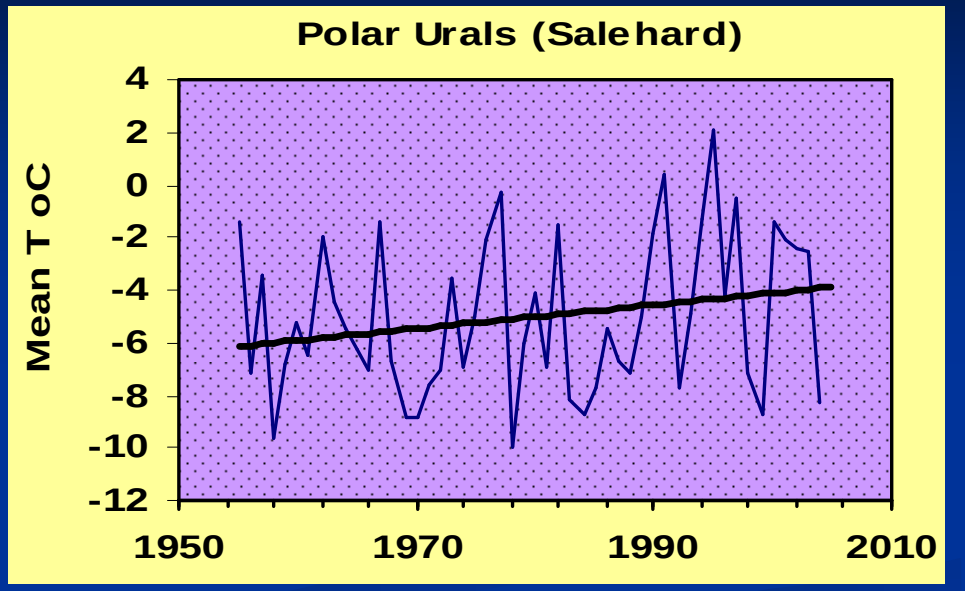


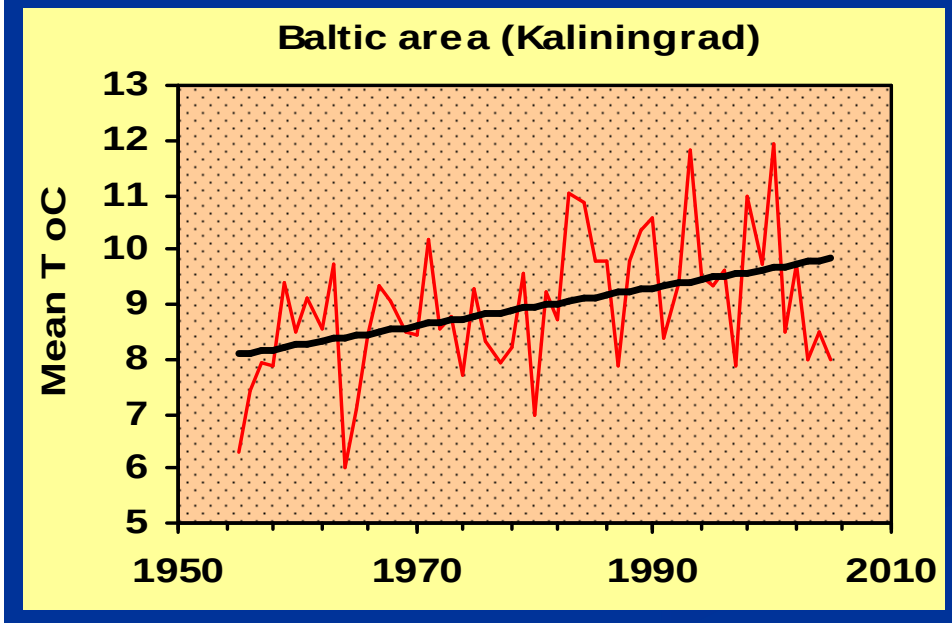
Position of regions (yellow color) which show a significant ($p < 0.05$) increase of <u>May temperature</u> in 1971-2000

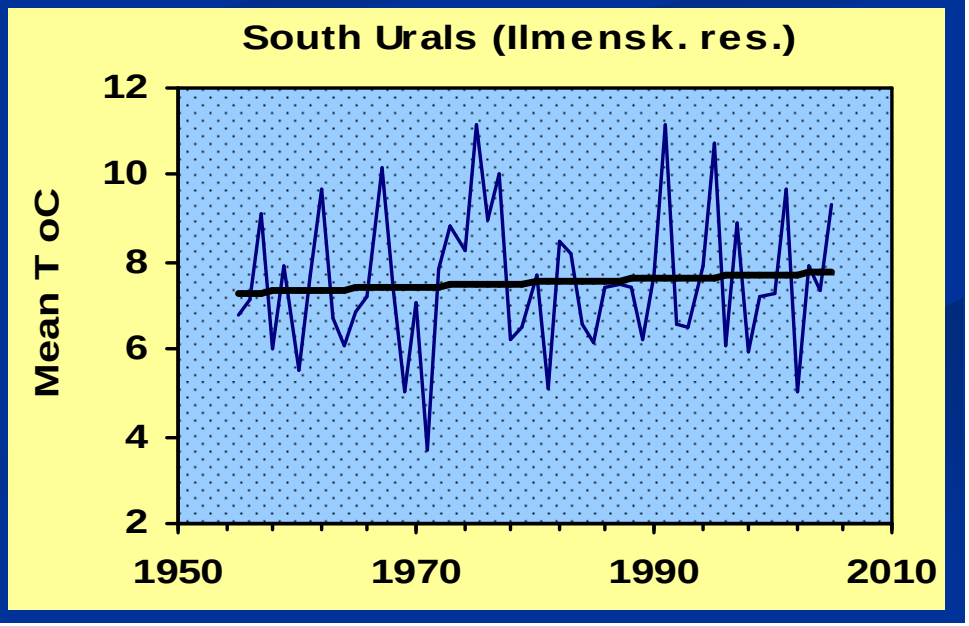


Long-term dynamics and trends of spring (Apr-May) temperatures in different parts of Eurasia

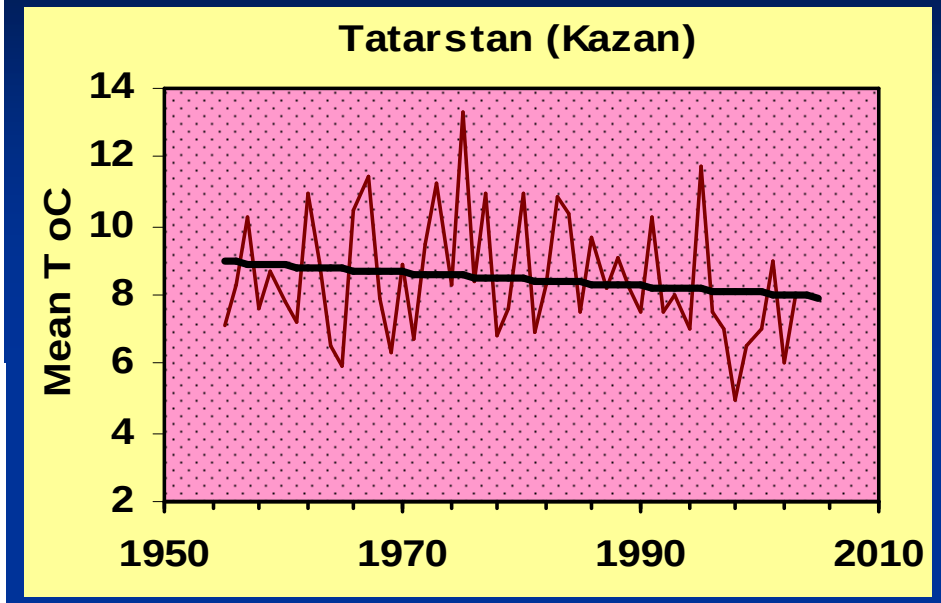


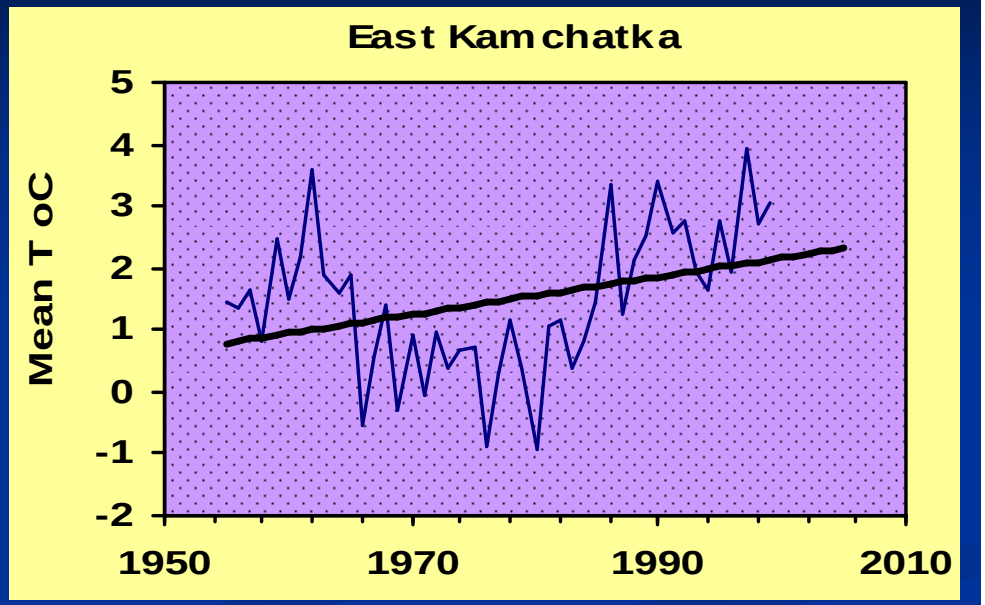


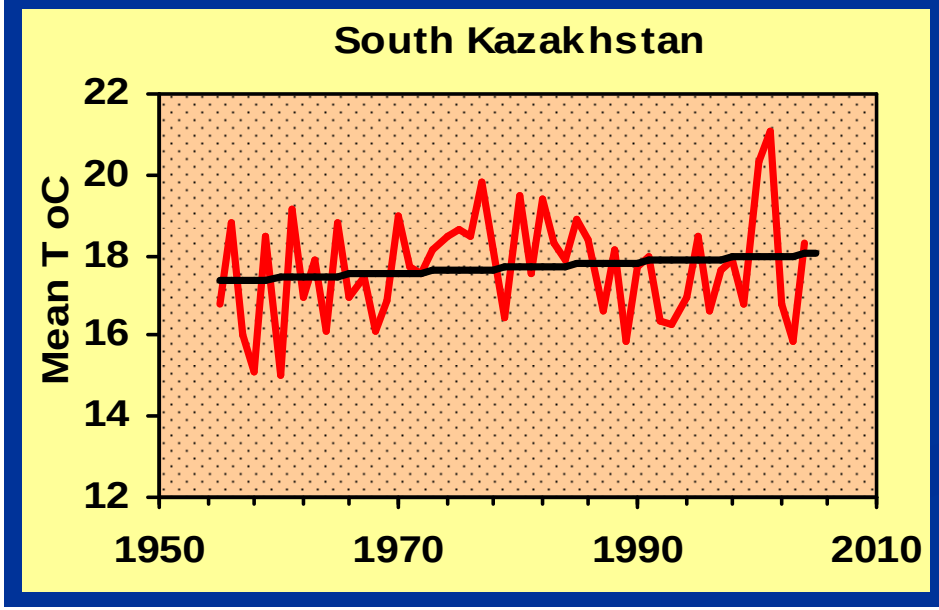


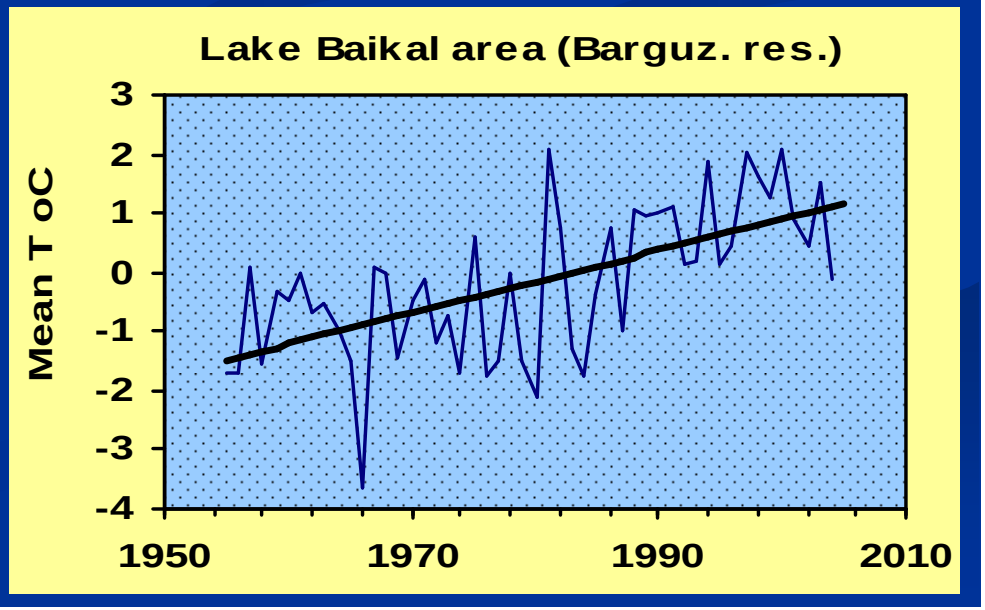


Long-term dynamics and trends of spring (Apr-May) temperatures in different parts of Eurasia

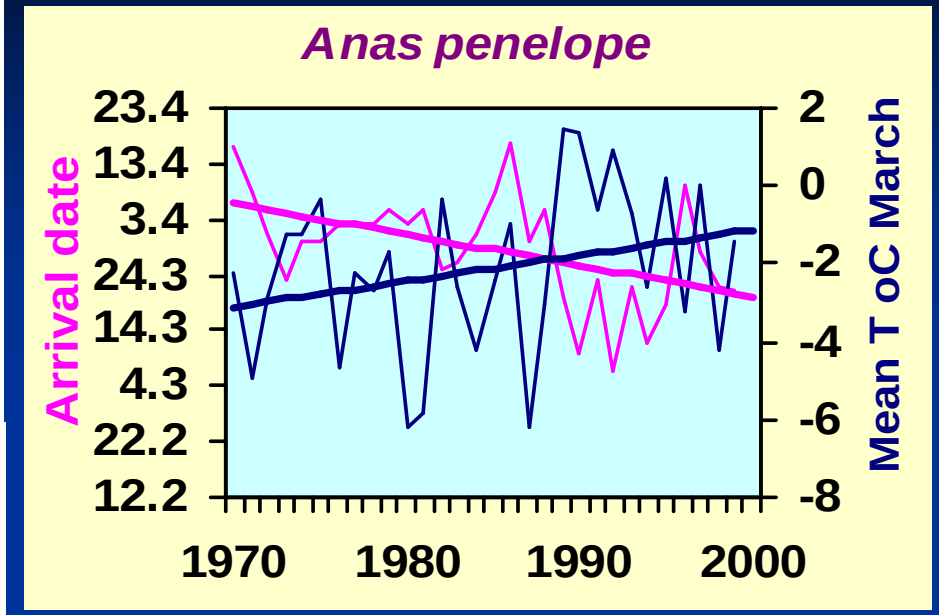


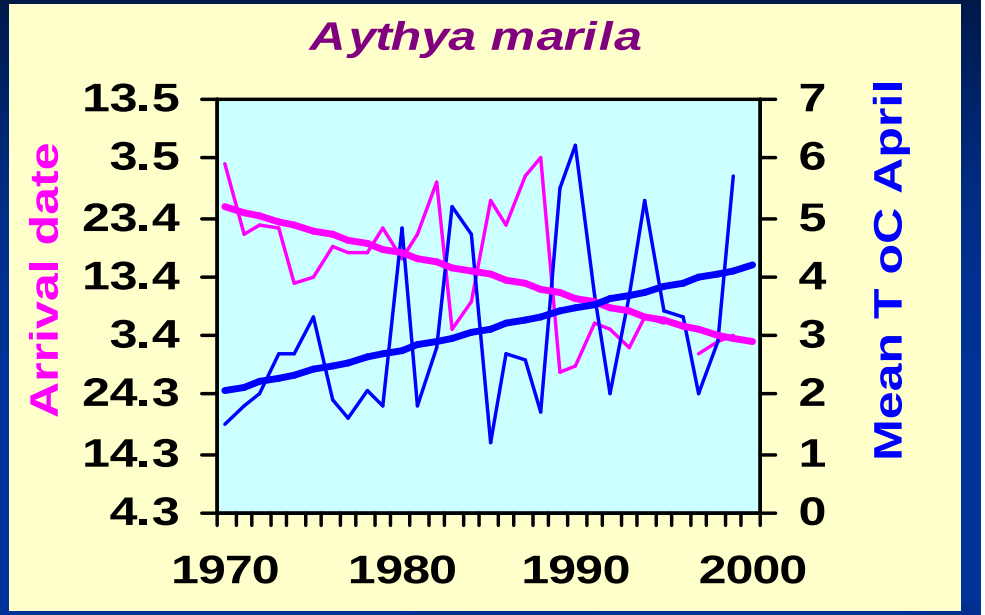


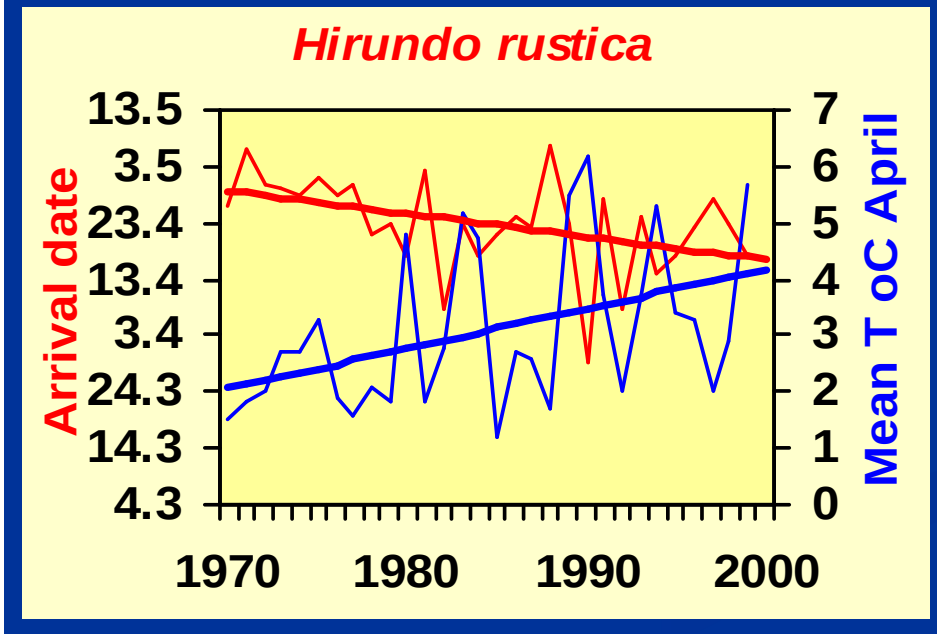


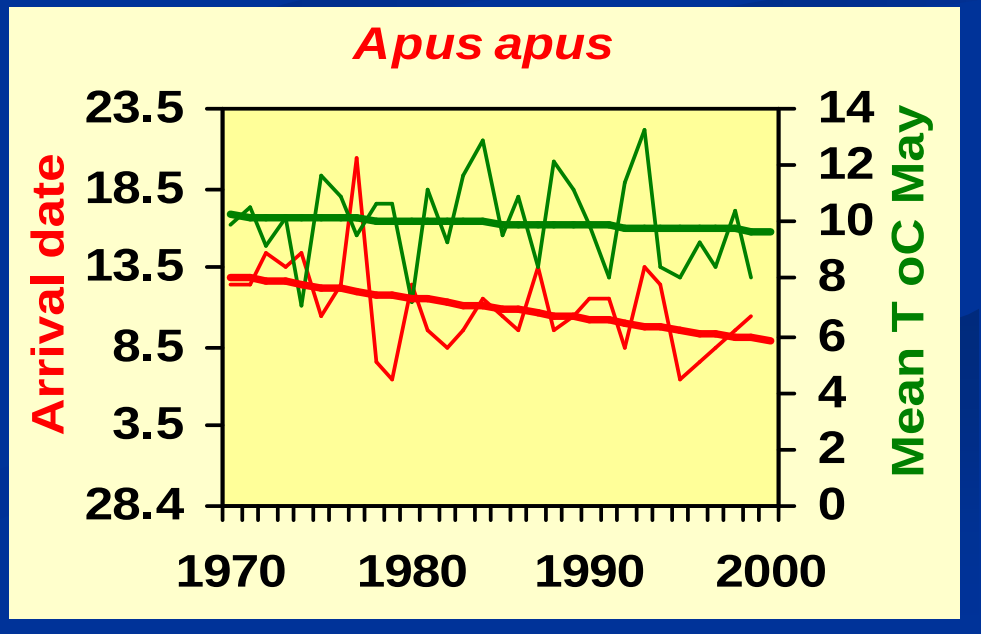


Change in the first arrival dates of migrants in Finland

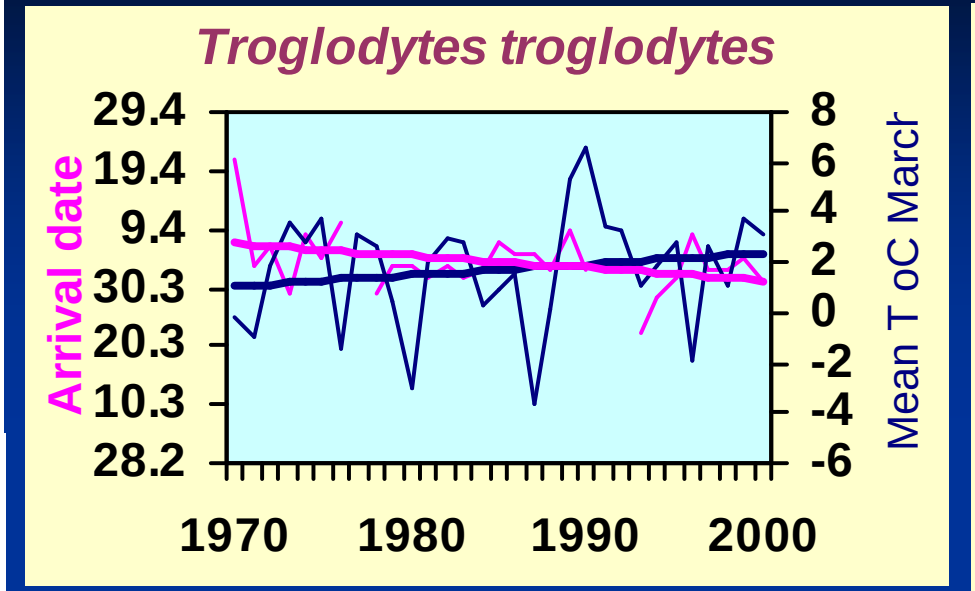


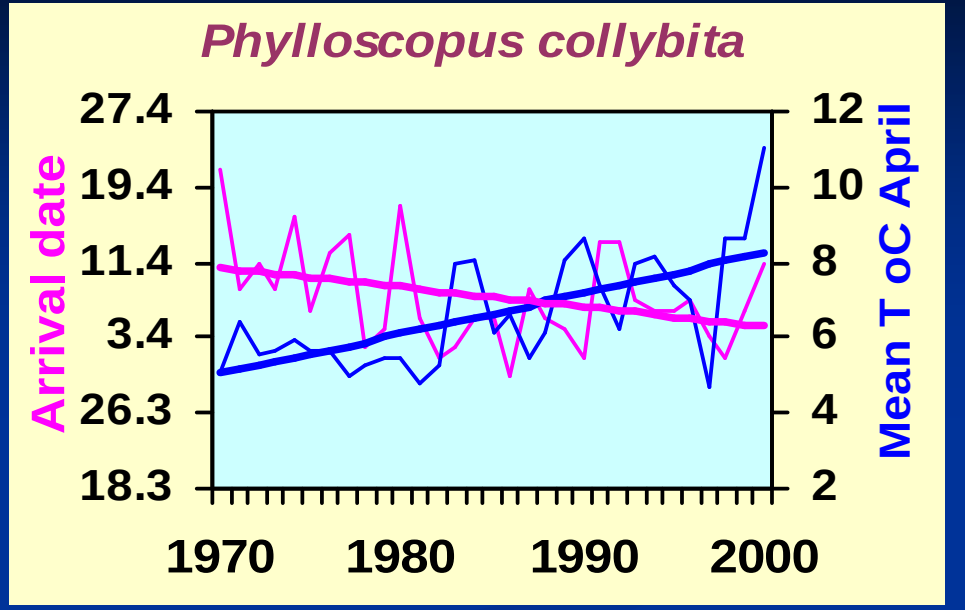


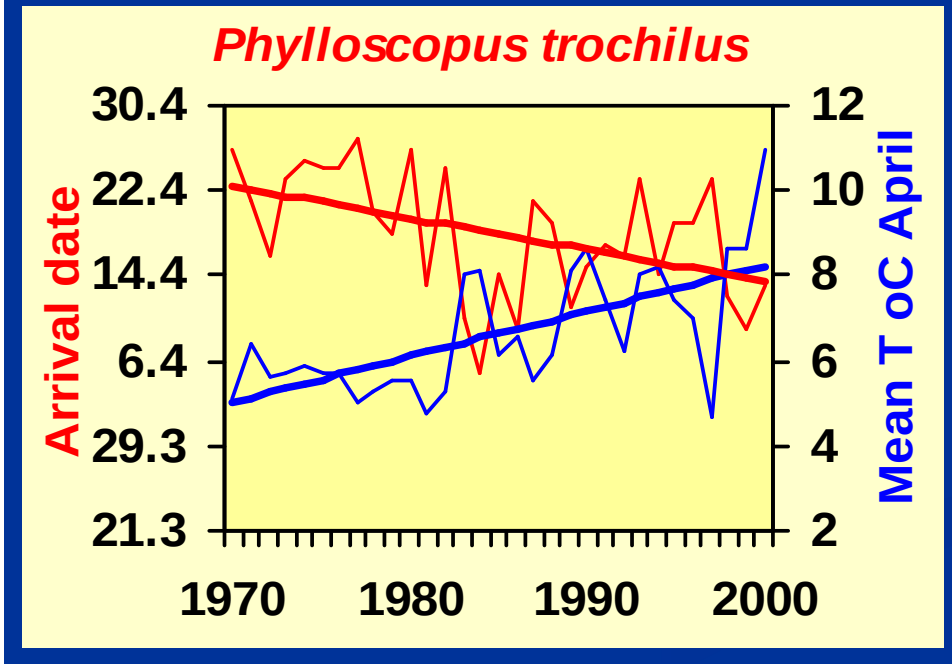


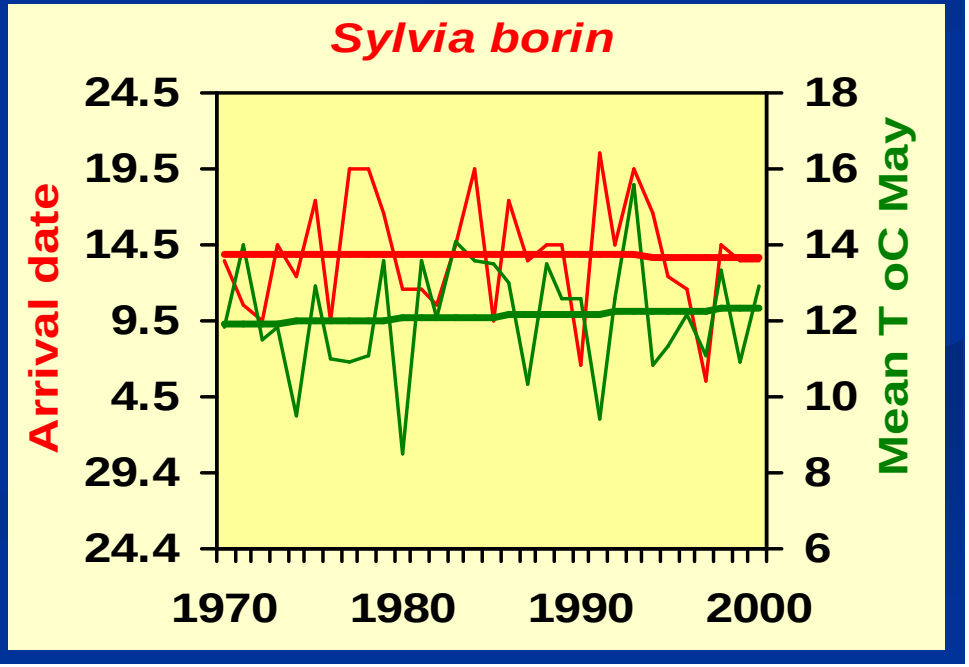


Change in the first arrival dates of migrants on the Courish Spit

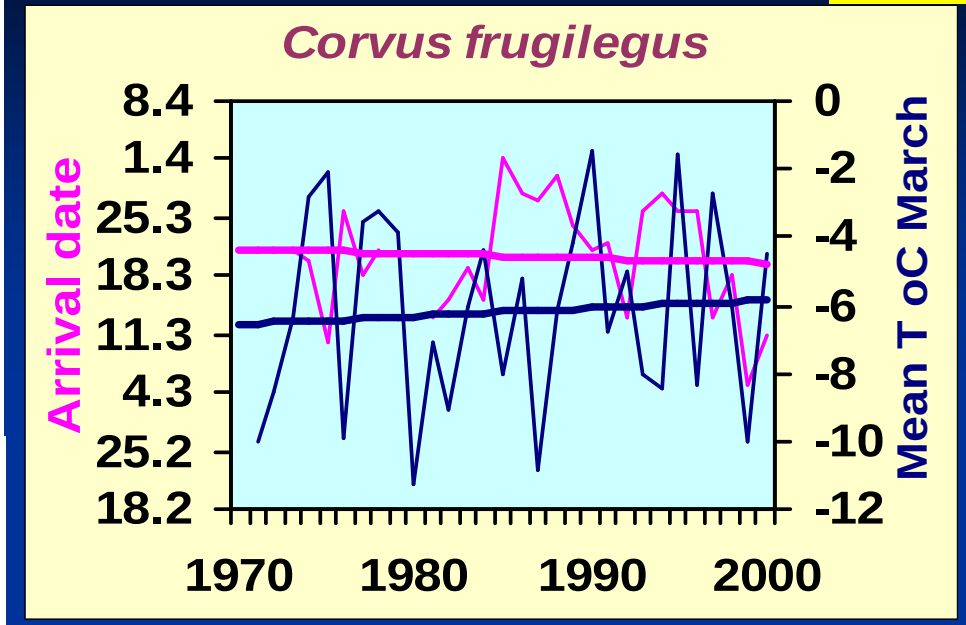


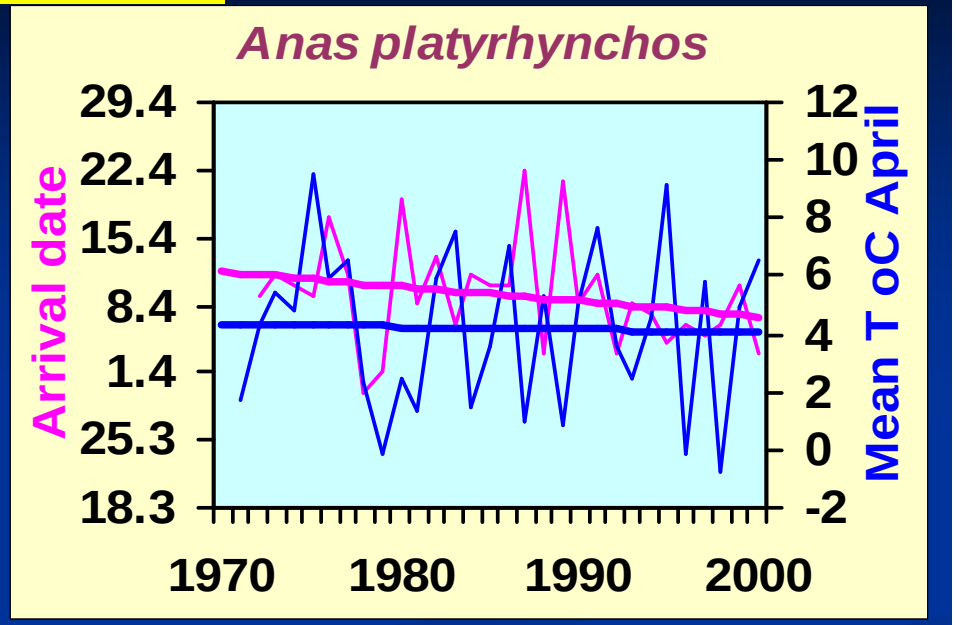


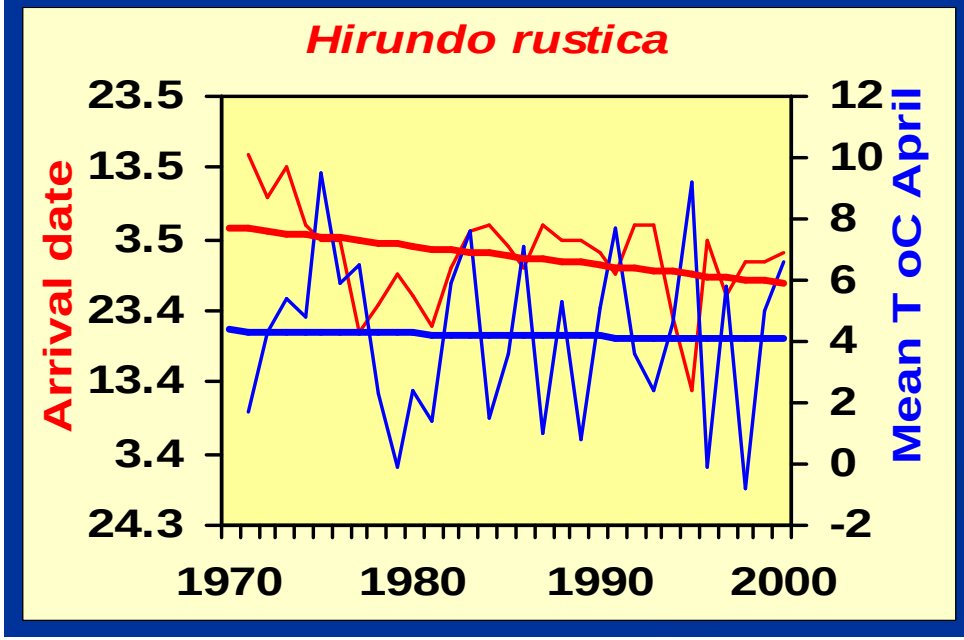


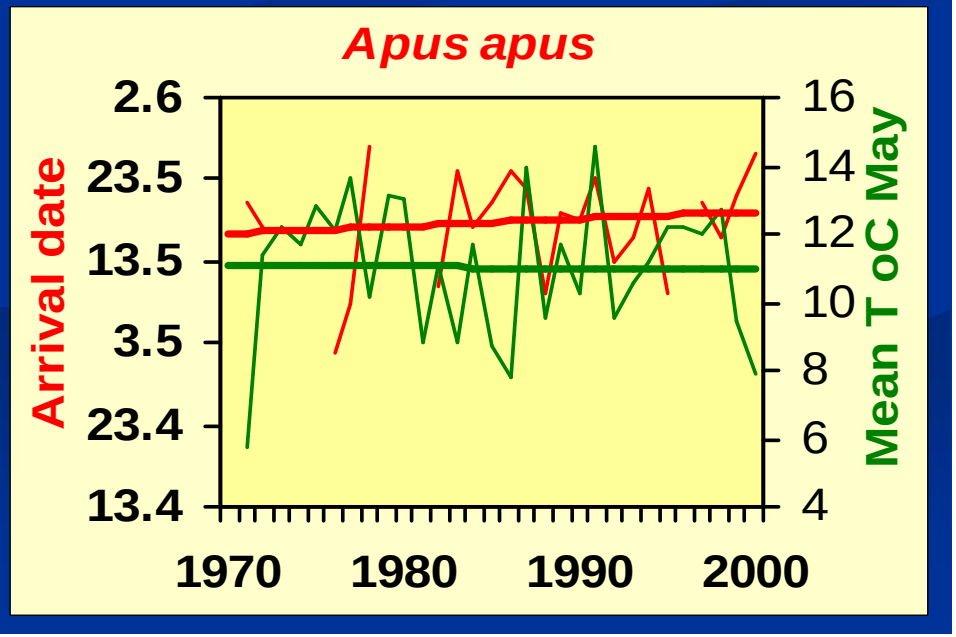


Change in the first arrival dates of migrants on the South Urals

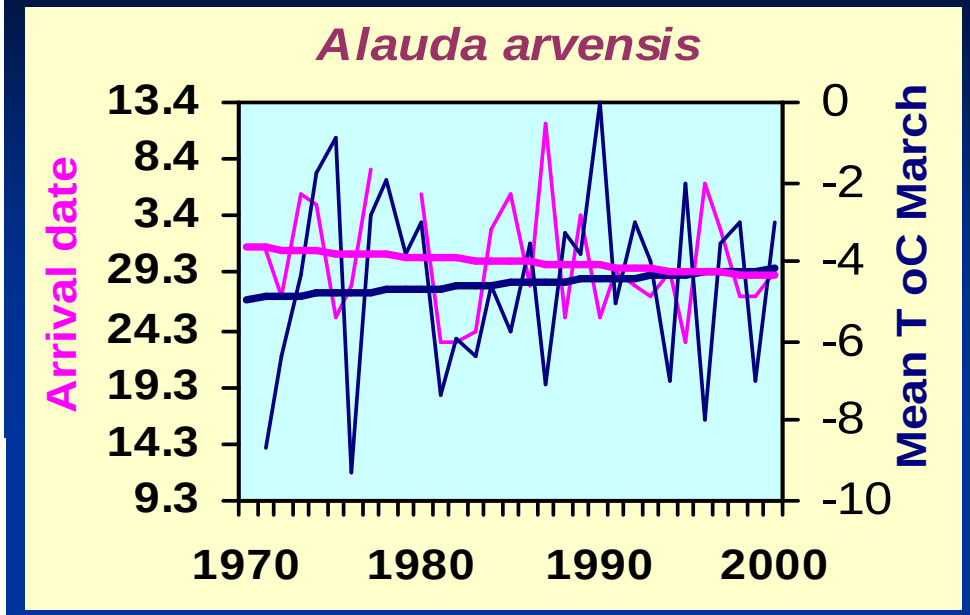


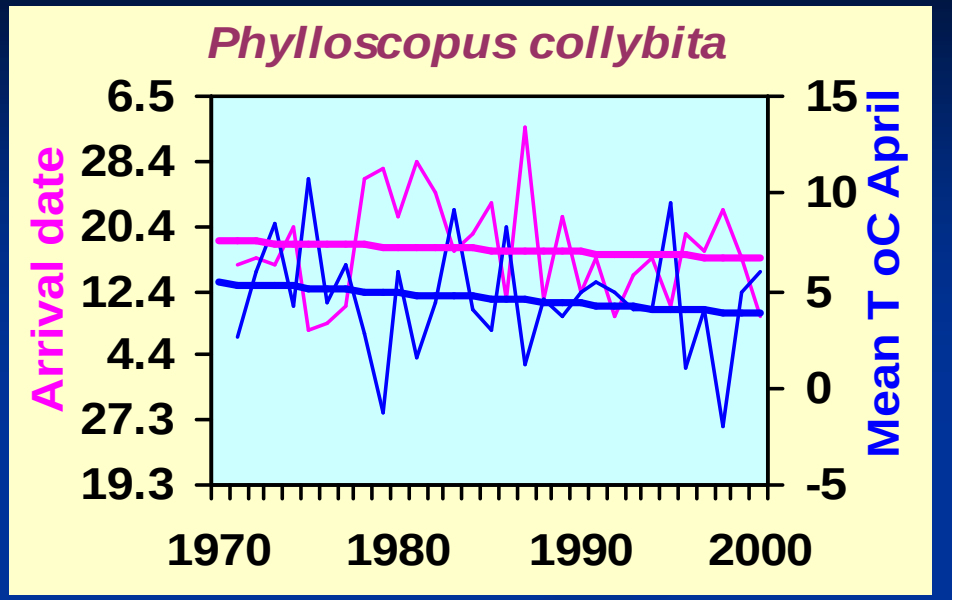


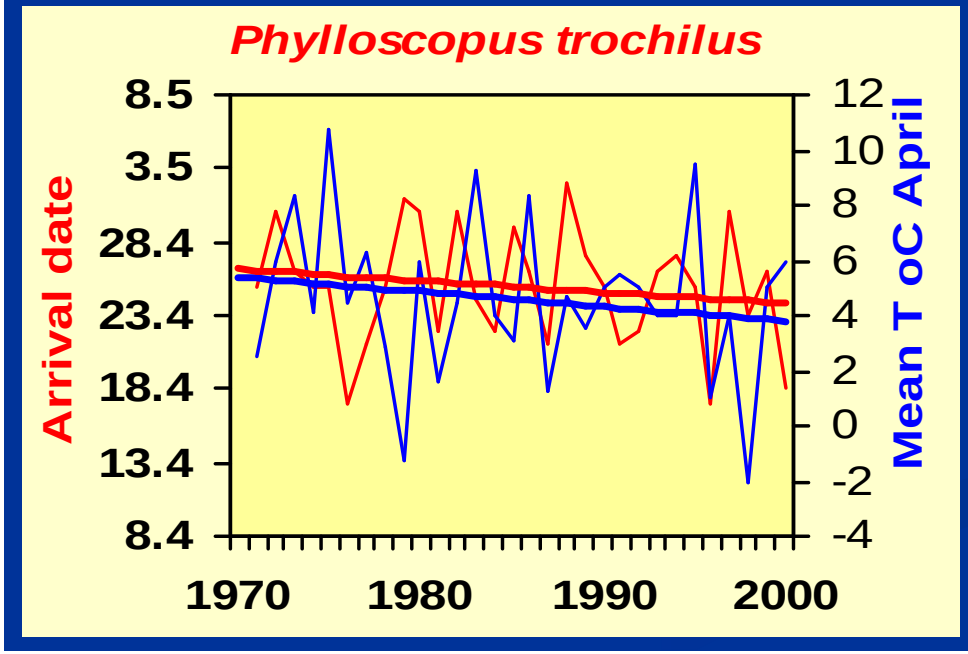


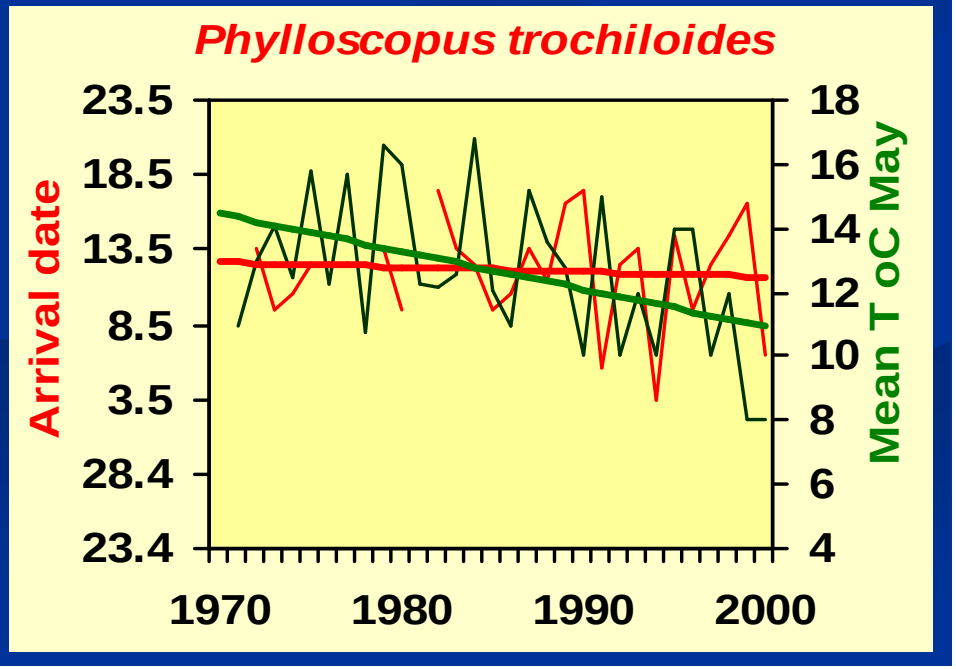


Change in the first arrival dates of migrants in Tatarstan

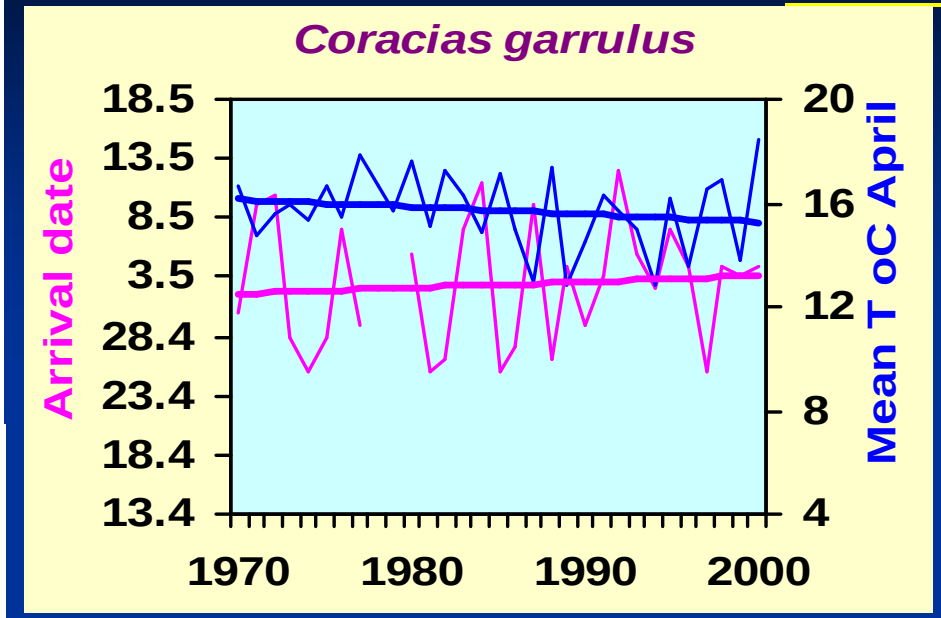


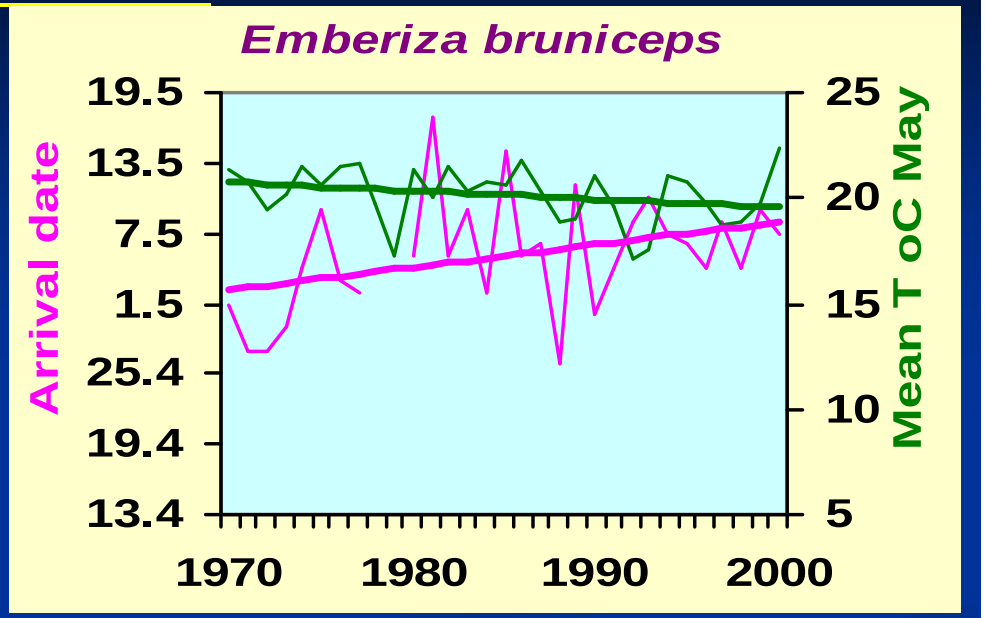


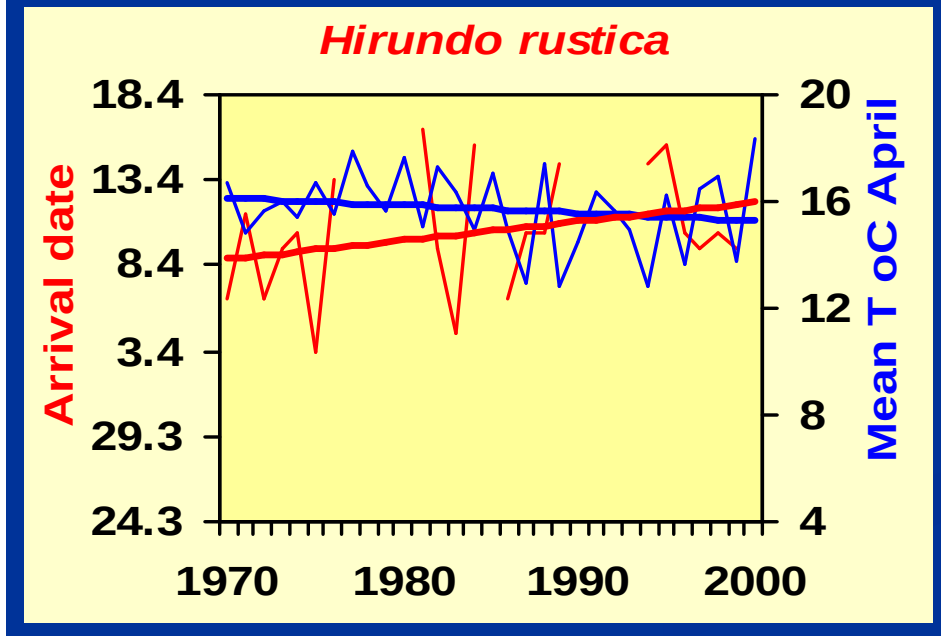


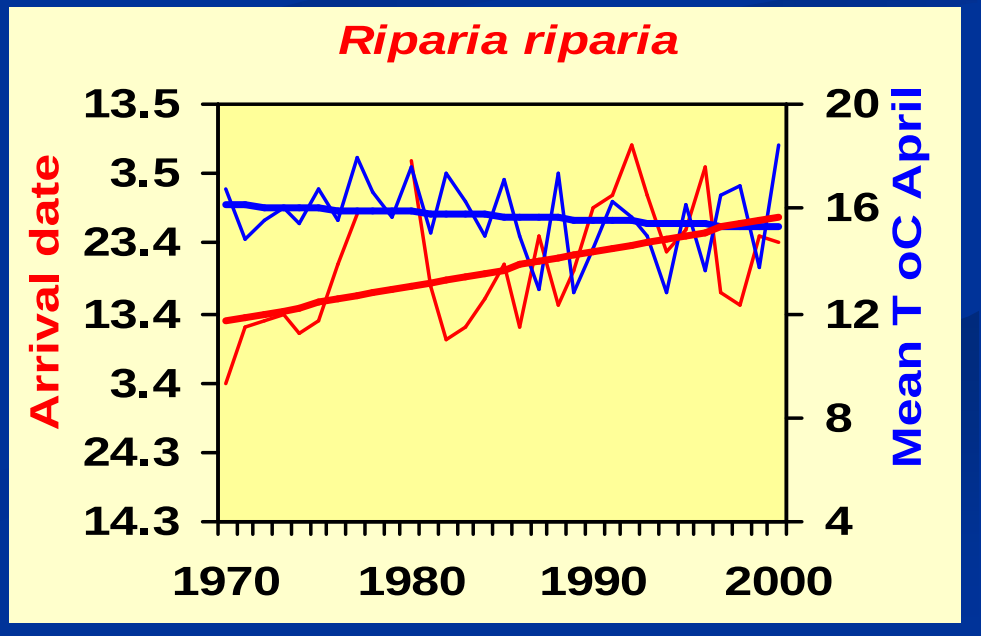


Change in the first arrival dates of migrants in South Kazakhstan

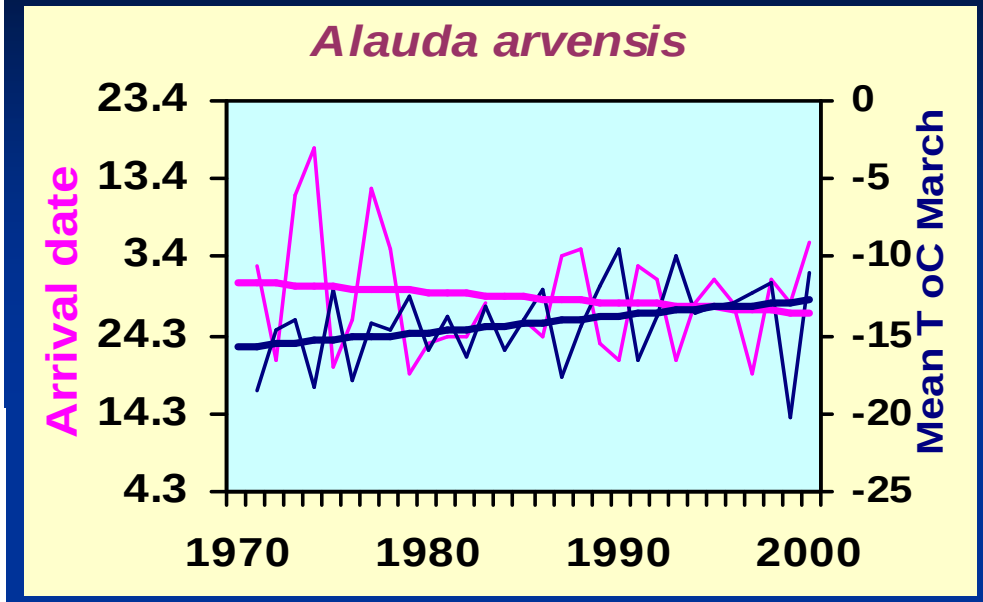


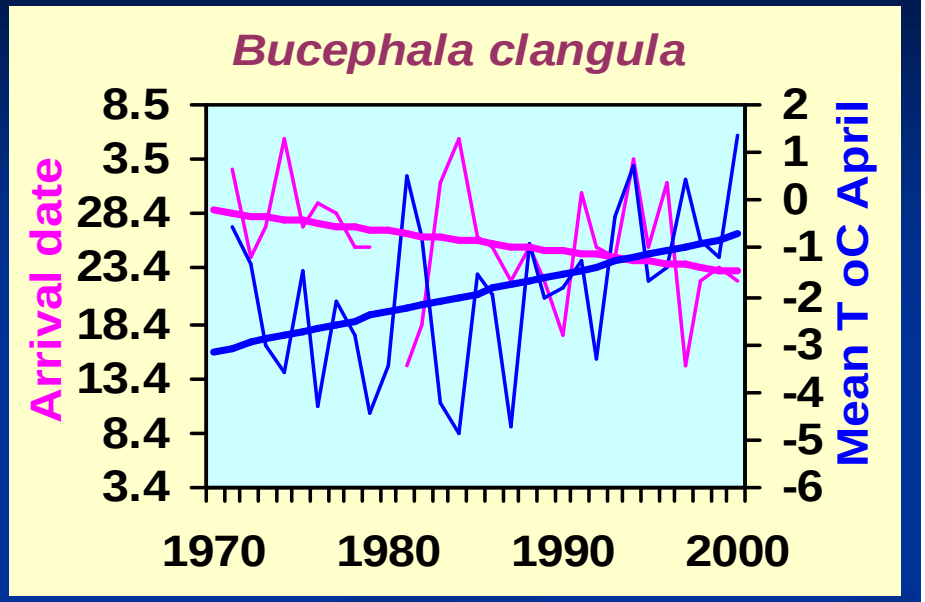


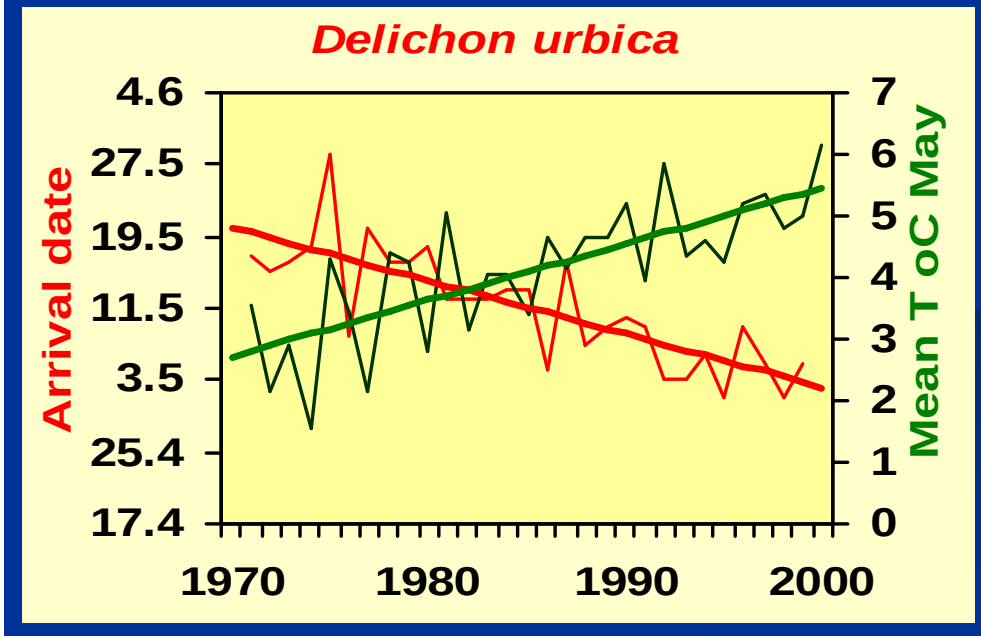


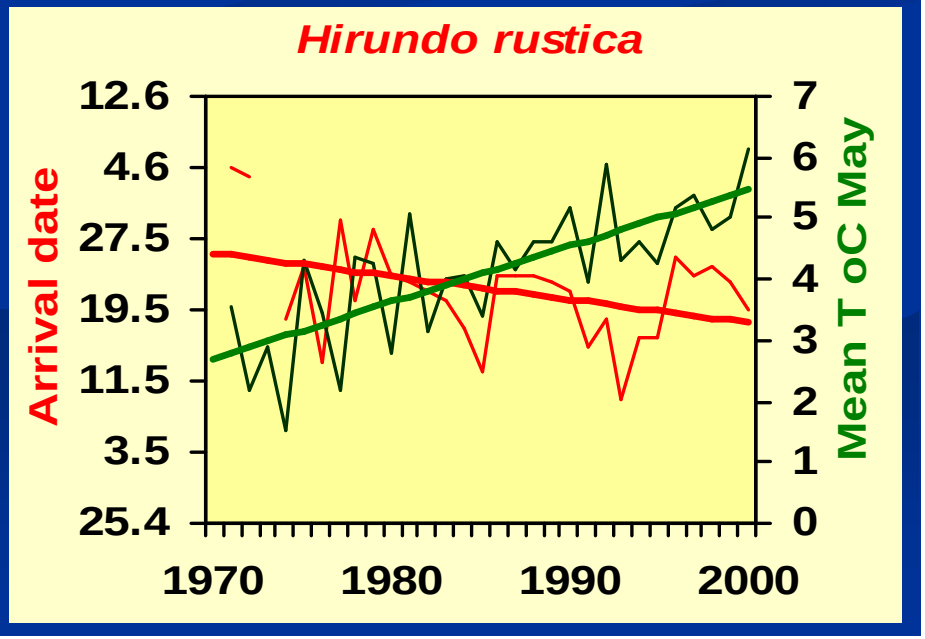


Change in the first arrival dates of migrants on the Lake Baikal

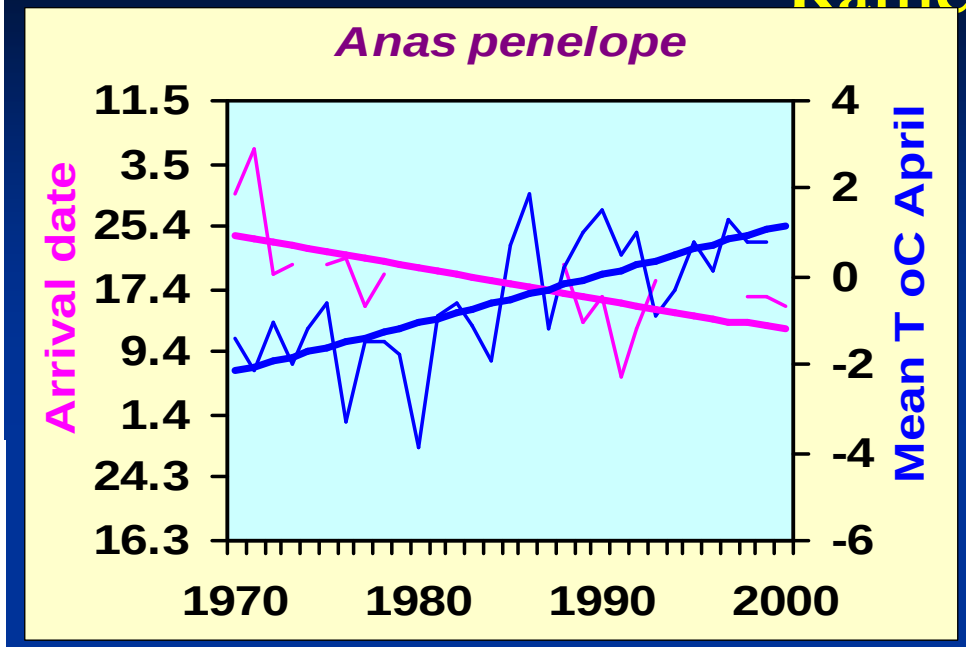


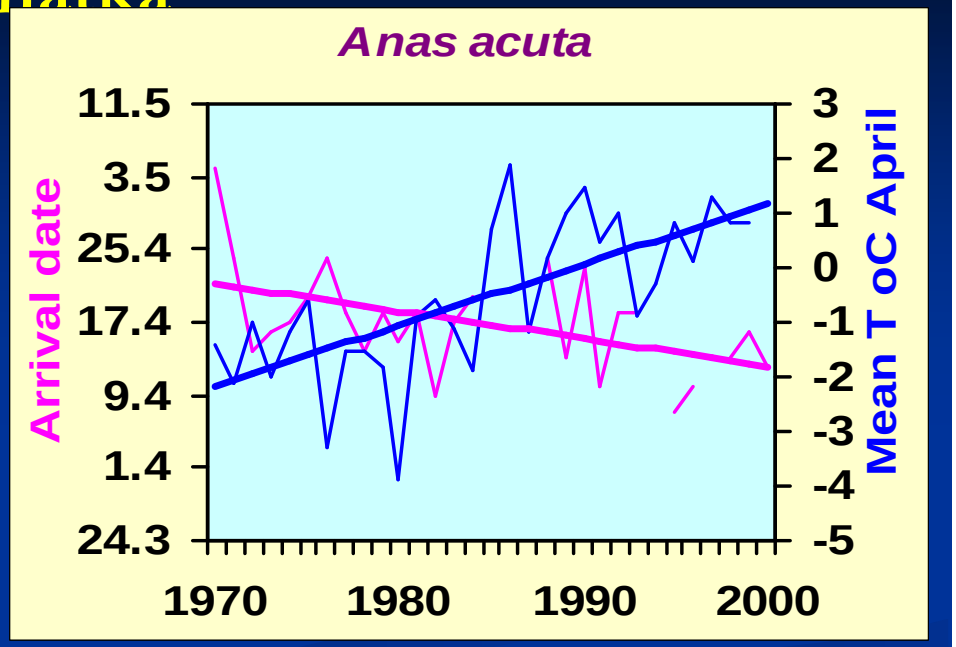


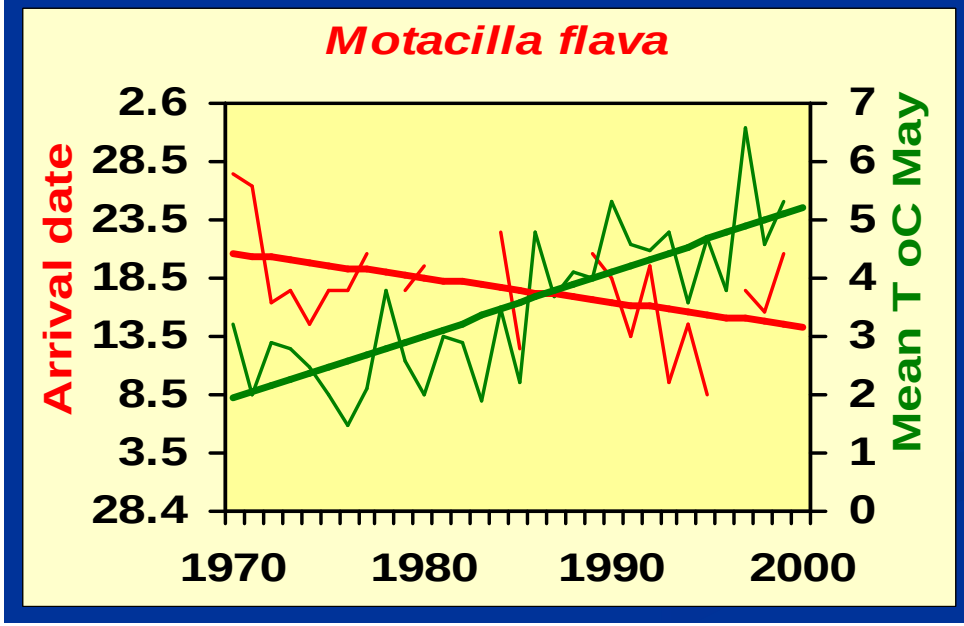


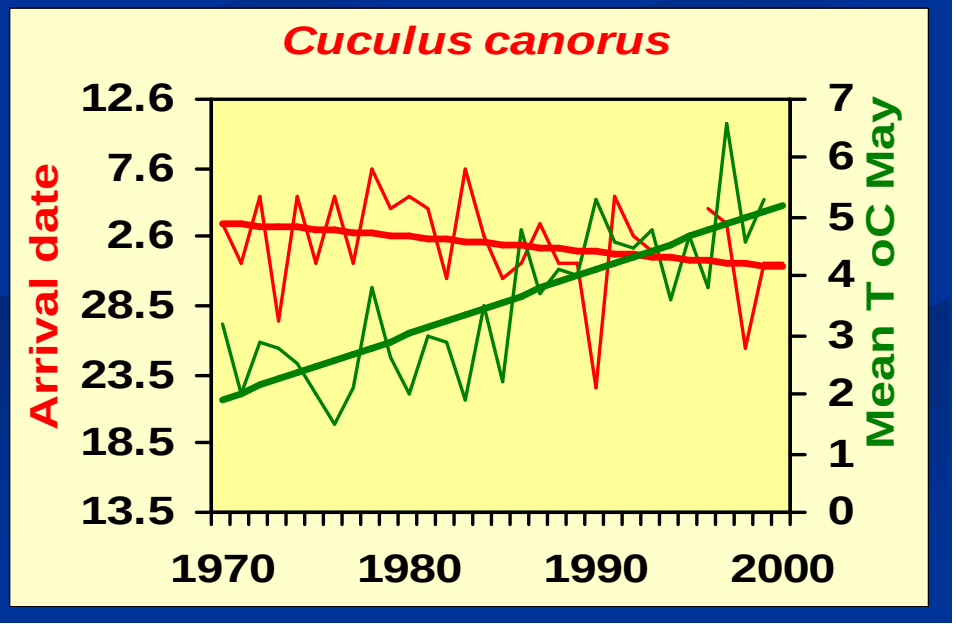


Change in the first arrival dates of migrants on the Kamchatka



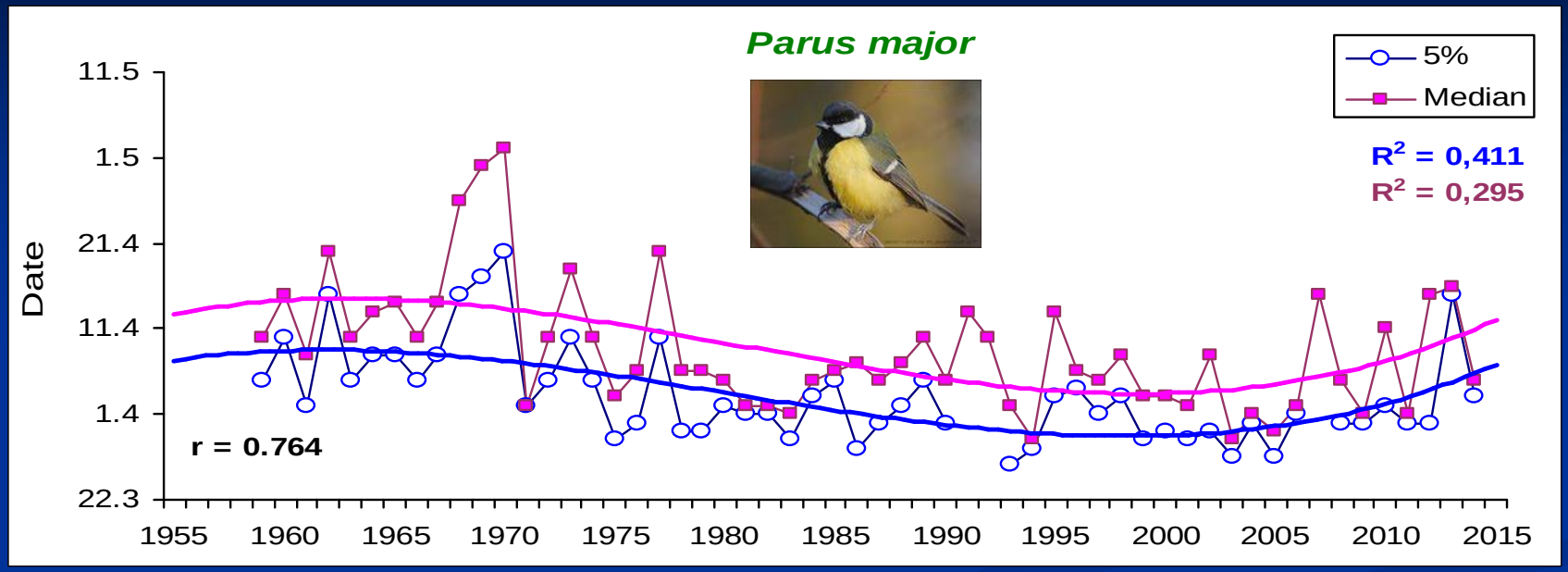


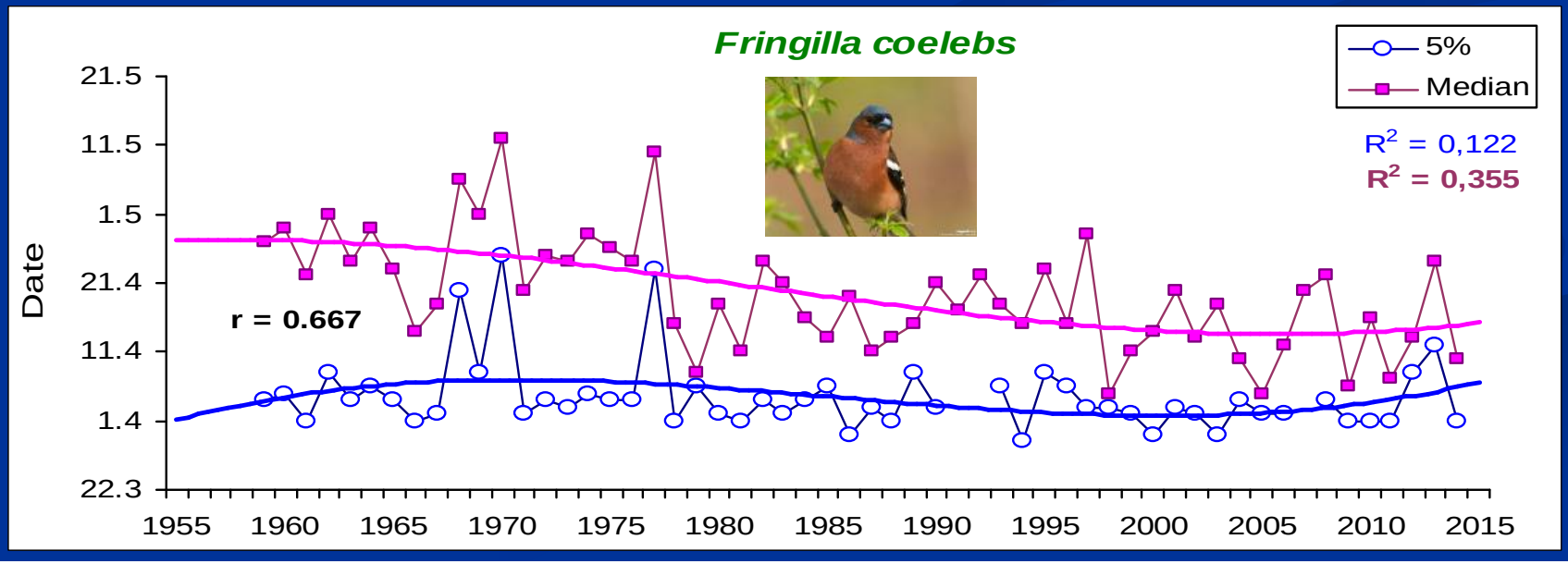




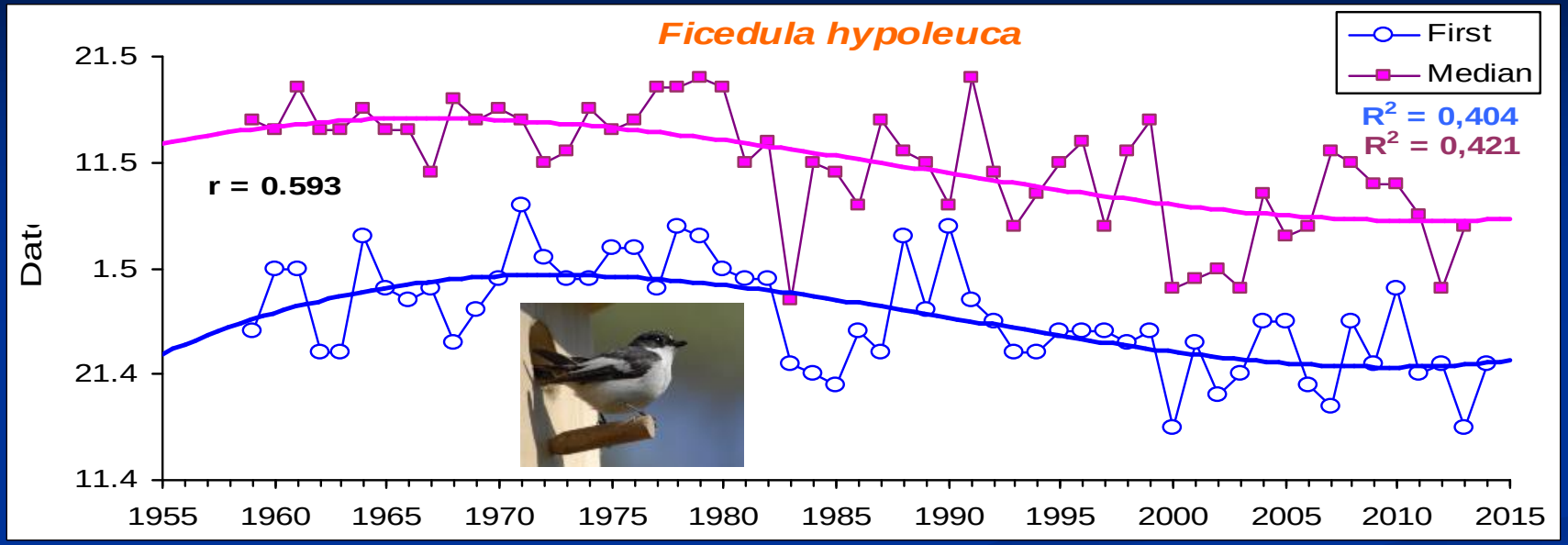
t j GdfhjsteOuqdw fnjatsf tsə ə j fnj dzdj?
dzdf GteOuqdd fnjf tsdzjsh ɹ ʁ tslsdzsə tsə tjlsdfuq

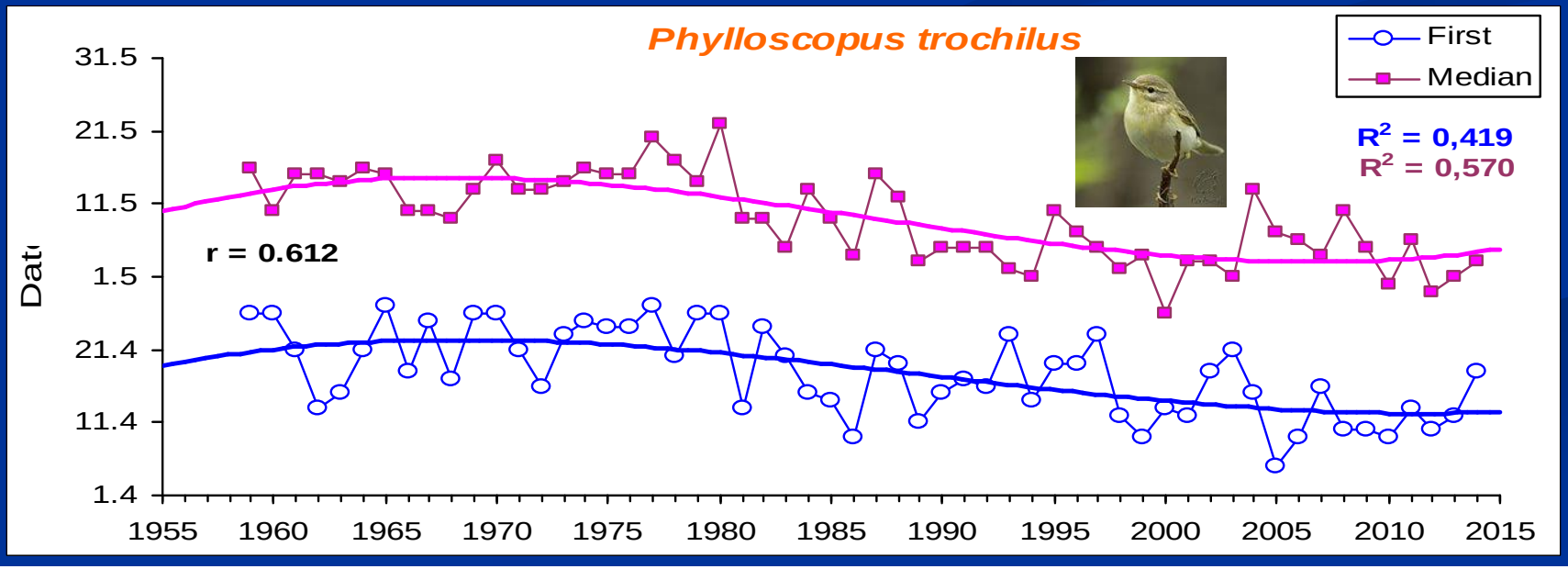
Long-term trends in the timing of spring migration on the Courish Spit (European migrants)



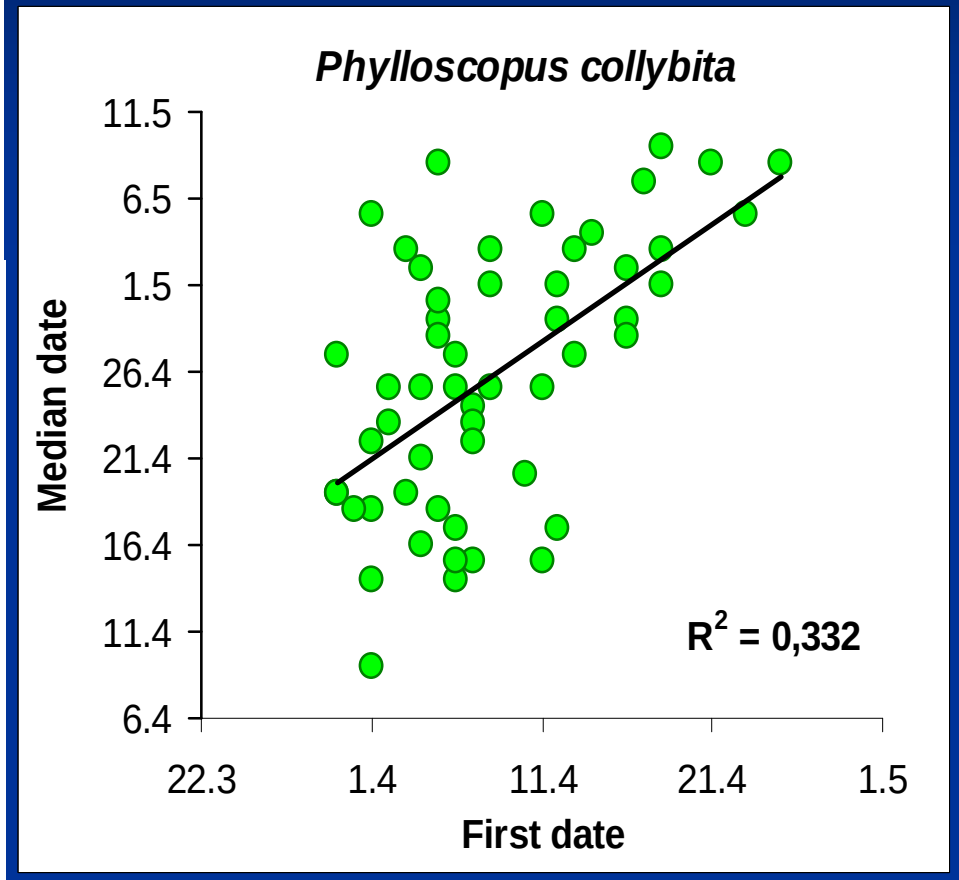


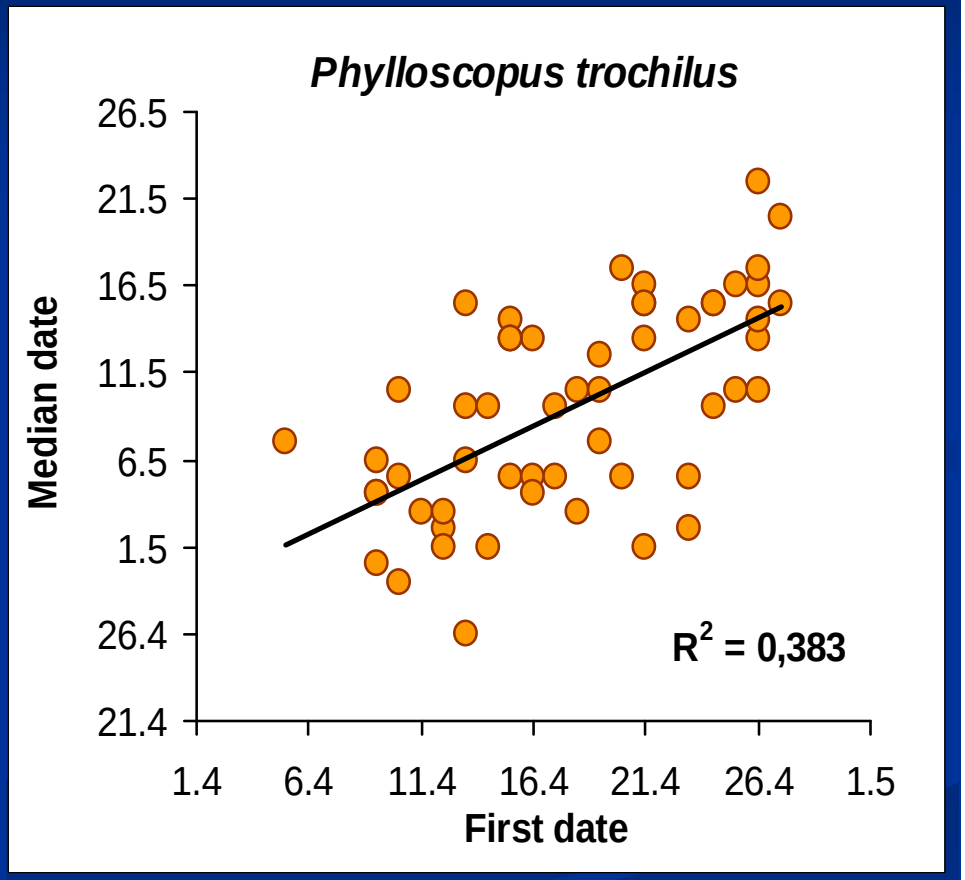
Long-term trends in the timing of spring migration on the Courish Spit (African migrants)



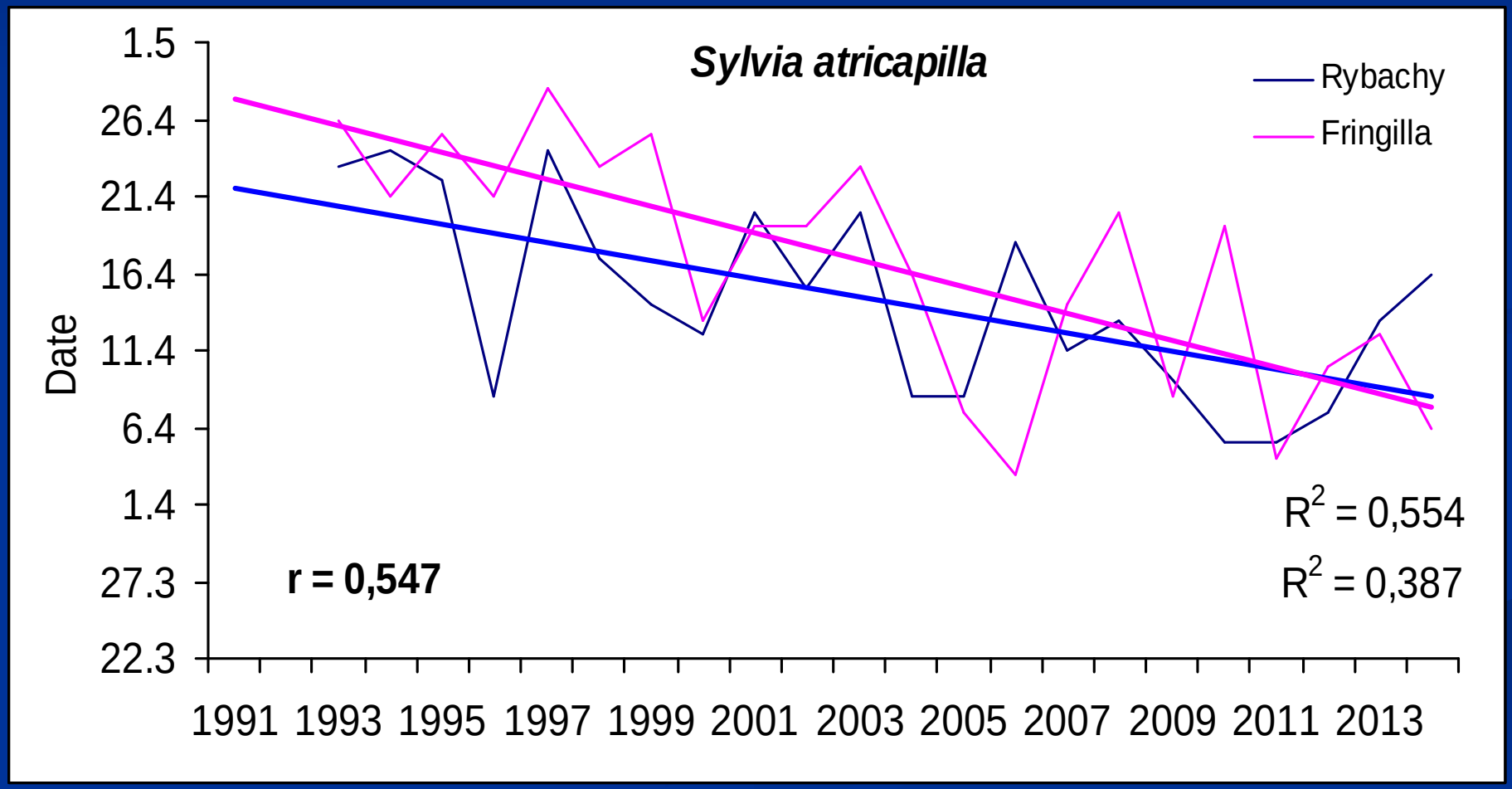


Связь сроков отлова птиц в большие ловушки на Куршской косе

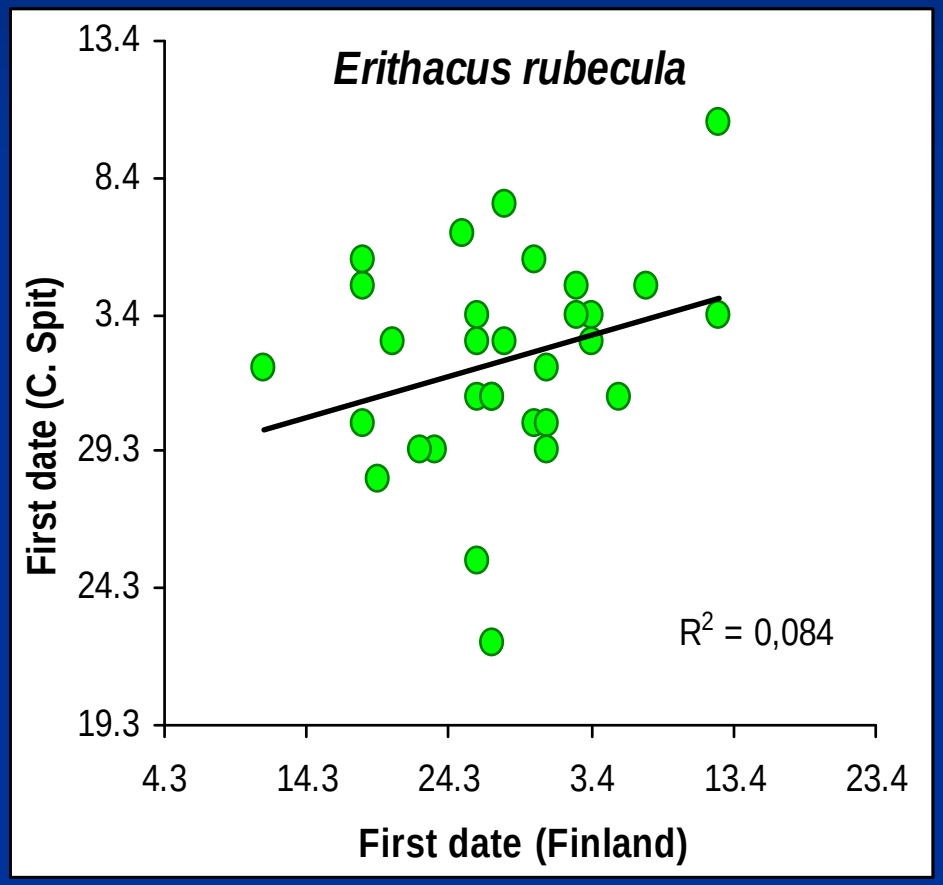


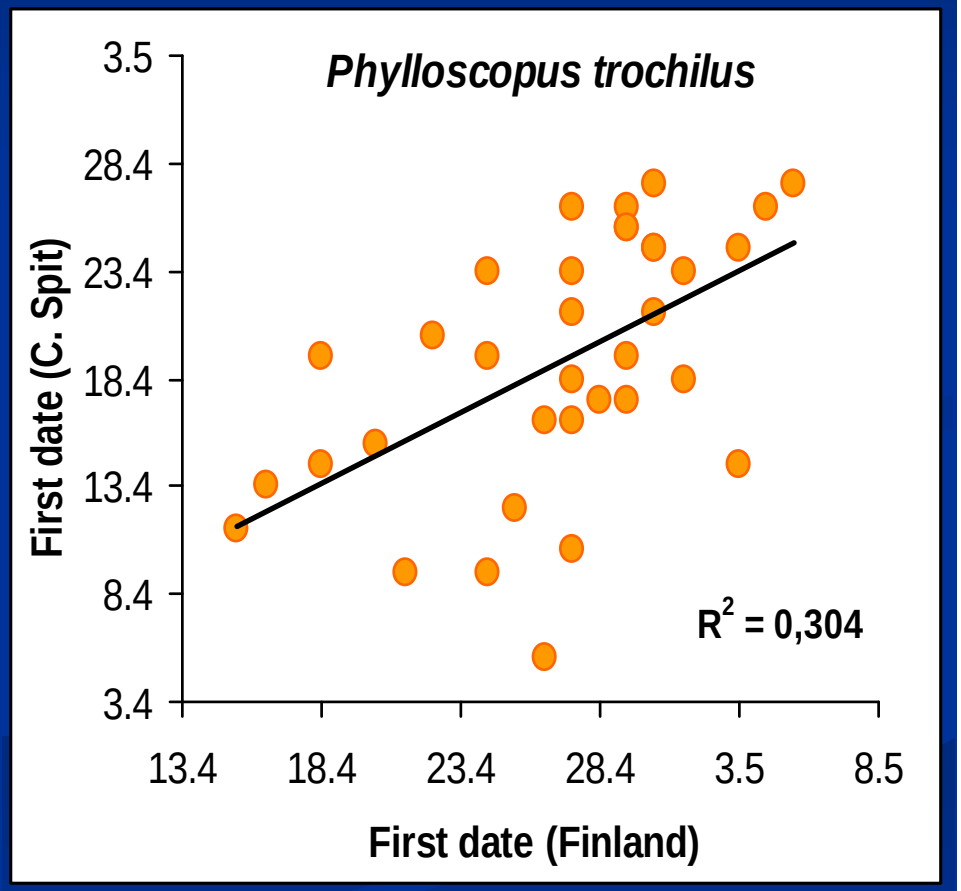


Связь сроков отлова птиц в большие ловушки и в путанки на Куршской косе



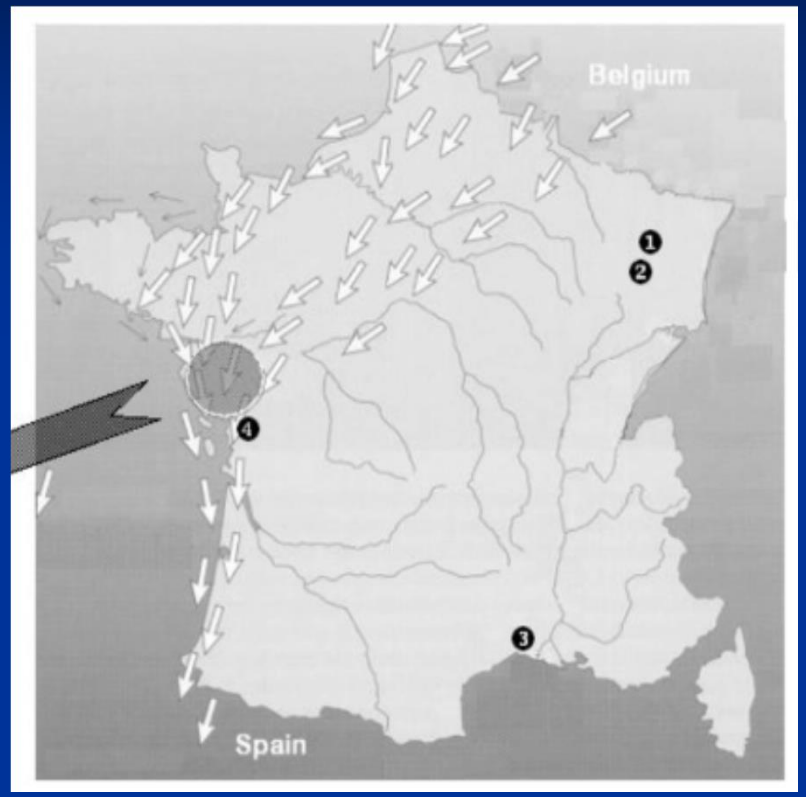
Связь сроков первой регистрации птиц на Куршской косе и в Финляндии

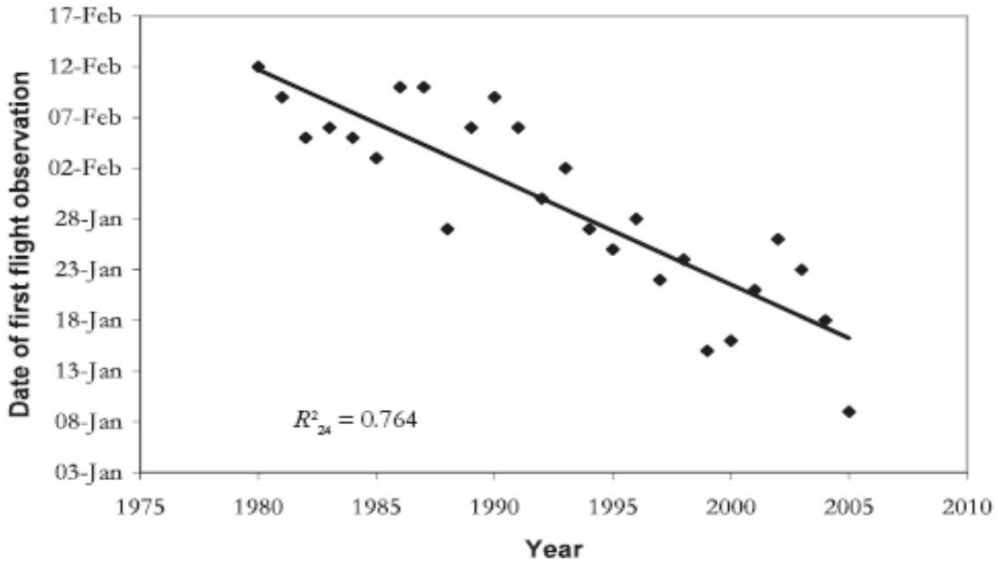


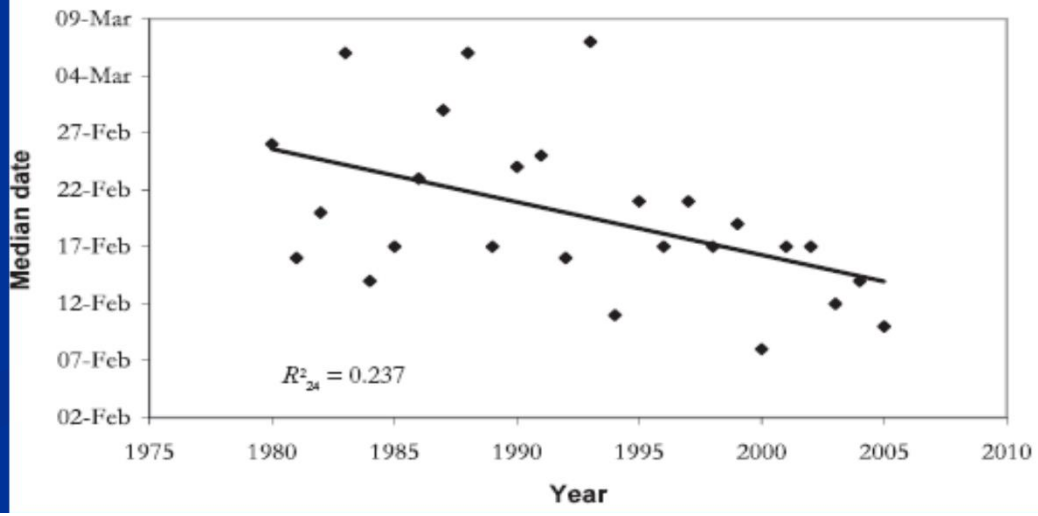


,I cf1LlzOdlZ dz&Ov tsj GCffljstdOuqcfw tslsdzj lsOtfJlsdfuq fnjLcfdzjtsə tsf

Изменение сроков отлета серых гусей с зимовок во Франции (Fouquet et al. 2009)







Novel methods reveal shifts in migration phenology of barn swallows in South Africa (Altwegg et al. 2012)

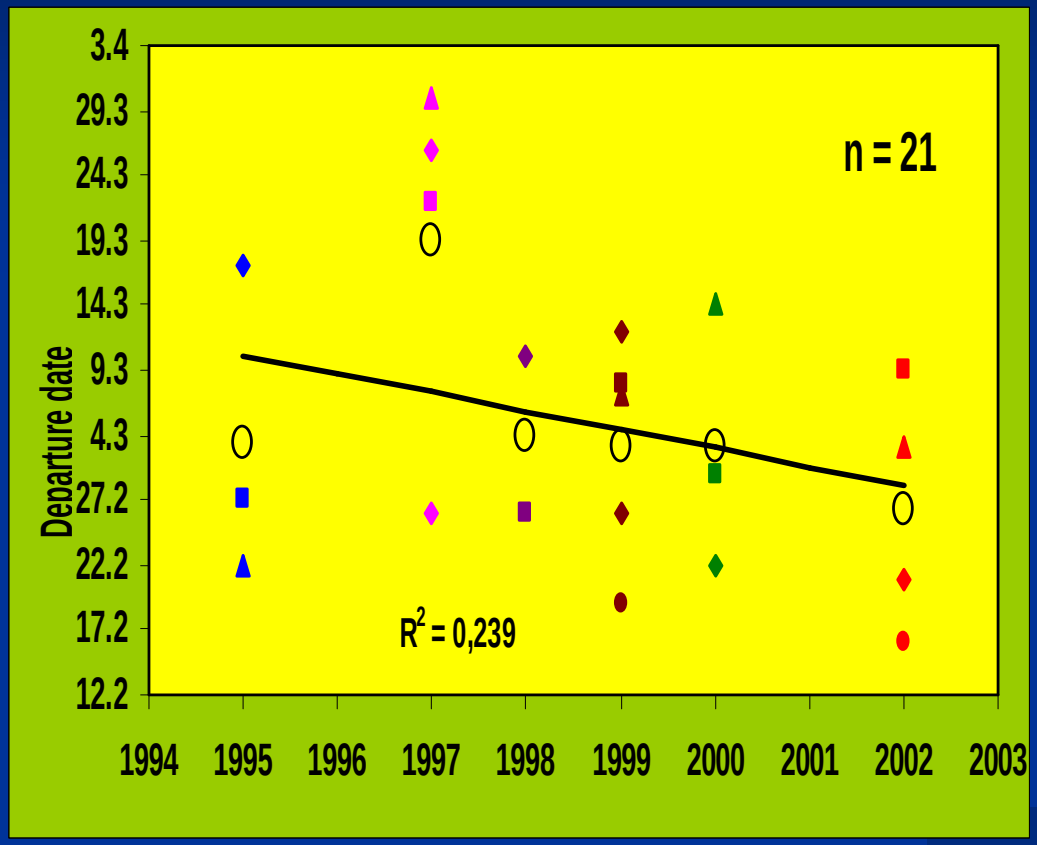
Using novel analytical methods based on bird atlas data, we found that swallows are now leaving northern parts of South Africa 8 days earlier than they did 20 years ago, and so shortened their stay in areas where they previously stayed the longest. Departure was related to environmental variability, measured through the Southern Oscillation Index (was earlier in years with a high SOI). High SOI indicates high precipitation across large parts of southern Africa, which may mean better conditions for refuelling and moult of barn swallows.

Patterns of bird migration phenology in South Africa (Bussière et al. 2014)

We examine the arrival and departure of nine Palearctic and seven intra-African migratory species in the central Highveld of South Africa, where the former spend their nonbreeding season and the latter their breeding season. Using novel analytical methods based on bird atlas data, we show phenological shifts in migration of five species - red-backed shrike, spotted flycatcher, common sandpiper, white-winged tern (Palearctic migrants), and diederik cuckoo (intra-African migrant) - between two atlas periods: 1987-1991 and 2007-2012. During this time period, Palearctic migrants advanced their departure from their South African nonbreeding grounds. This trend was mainly driven by waterbirds. No consistent changes were observed for intra-African migrants.

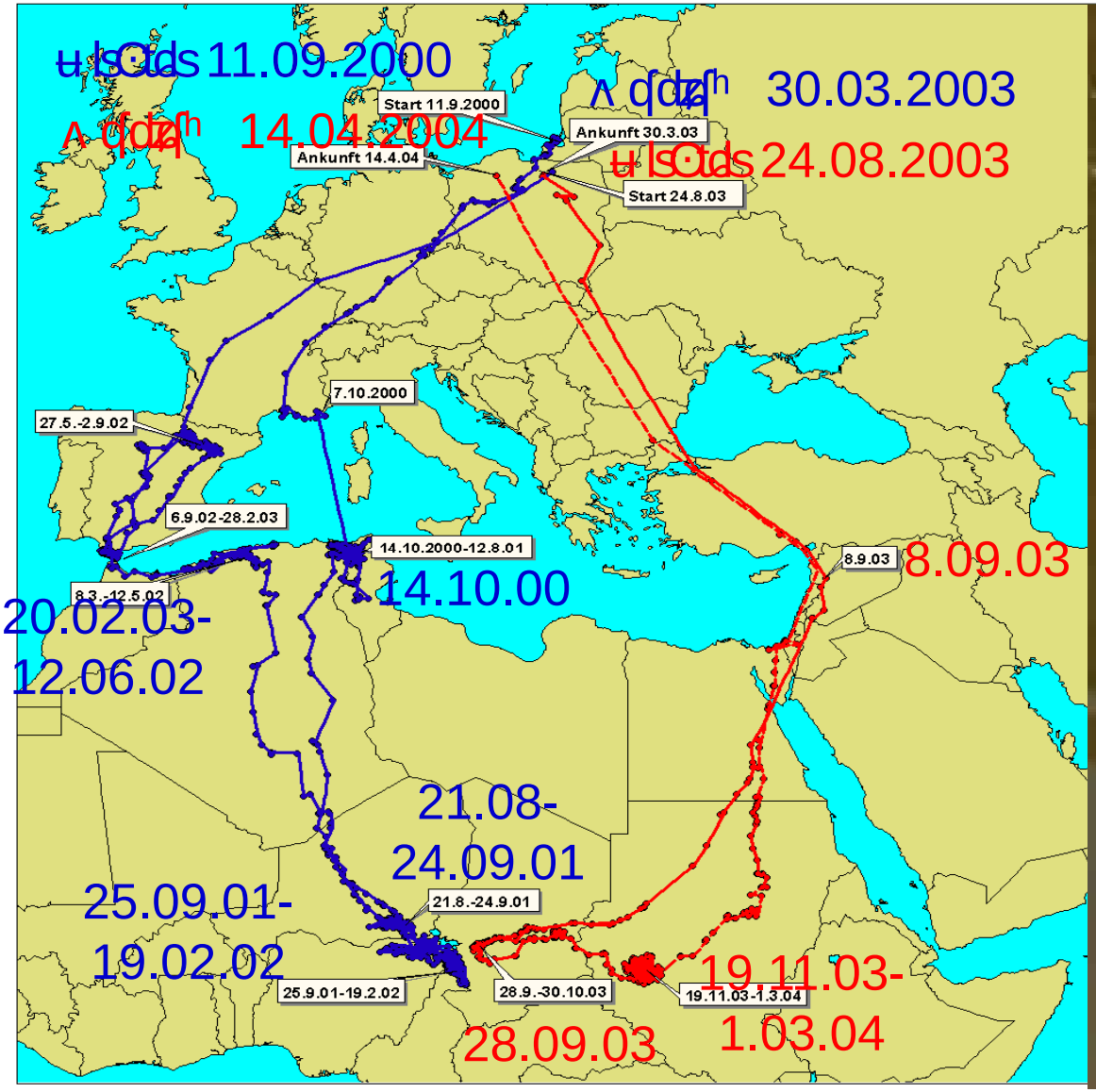
t j GdfilstaOudw fnjatsf tsa tslsdj lsOd tftadj lsO
tflsdu fnjtf tsdjs^h ^ ^ fnjlzlsdzdf tsa^r ^
tfj tgj HOlsudf tsa d Gj tsdzsf Olststatsa

Сроки отлета взрослых аистов с зимовок в Африке по данным спутникового слежения (Kaatz 2004, Kosarev, Sokolov 2007)

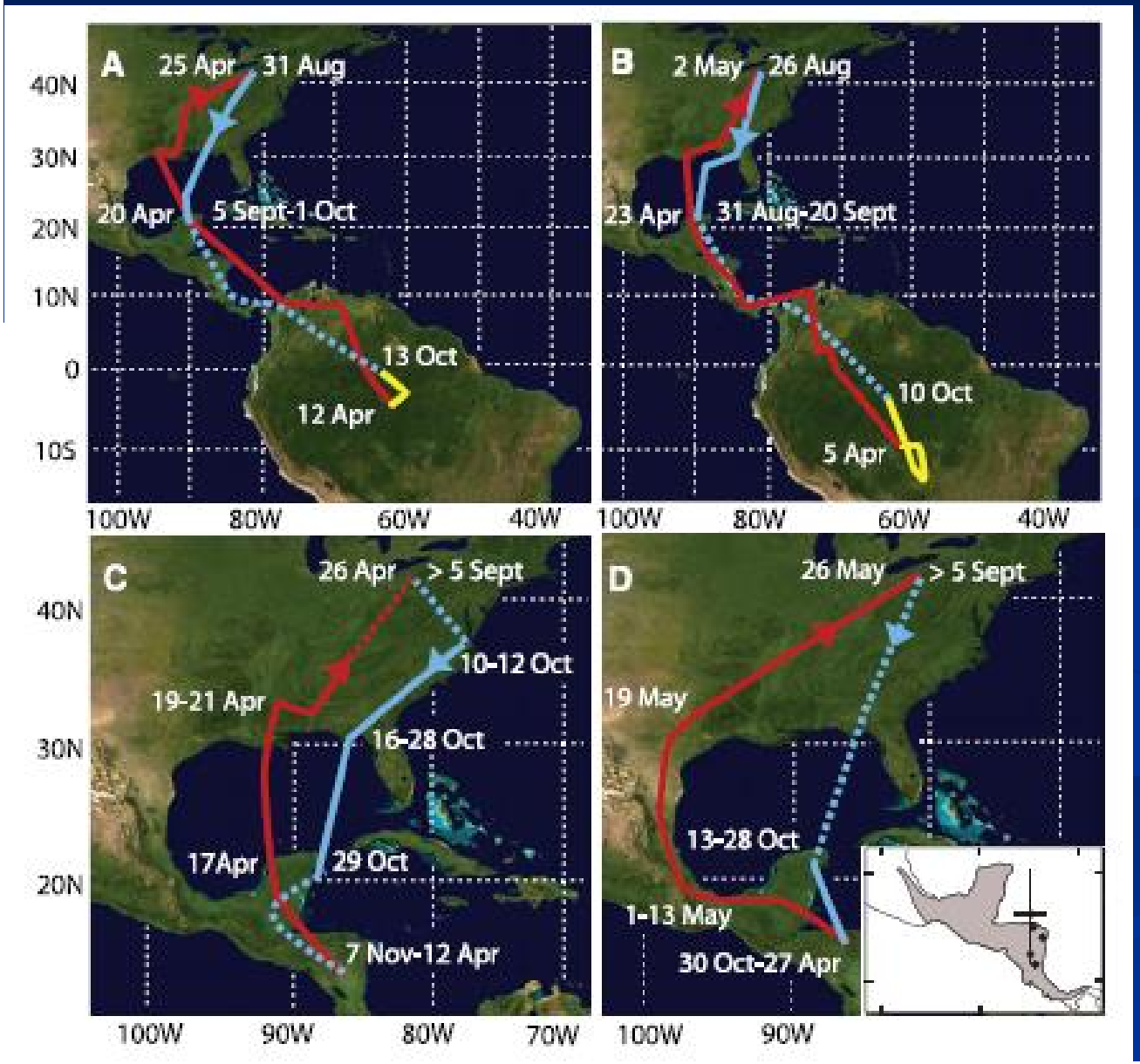


В 1997 г. в феврале было отмечено похолодание на огромной территории от Черного и Каспийского морей до побережья Гвинейского залива, оно охватило всю Восточную Африку и районы южного Сахеля. Это, по-видимому, ухудшило кормовые условия для аистов, в результате чего они задержали свой отлет с мест зимовки почти на месяц.

Возвращения белого аиста, задержанного в вольере, в район рождения (Chernetsov et al. 2005)



Результаты логгерного слежения за миграциями пурпурной ласточки (A-B) и лесного дрозда (C-D) (Stutchbury et. al 2009)

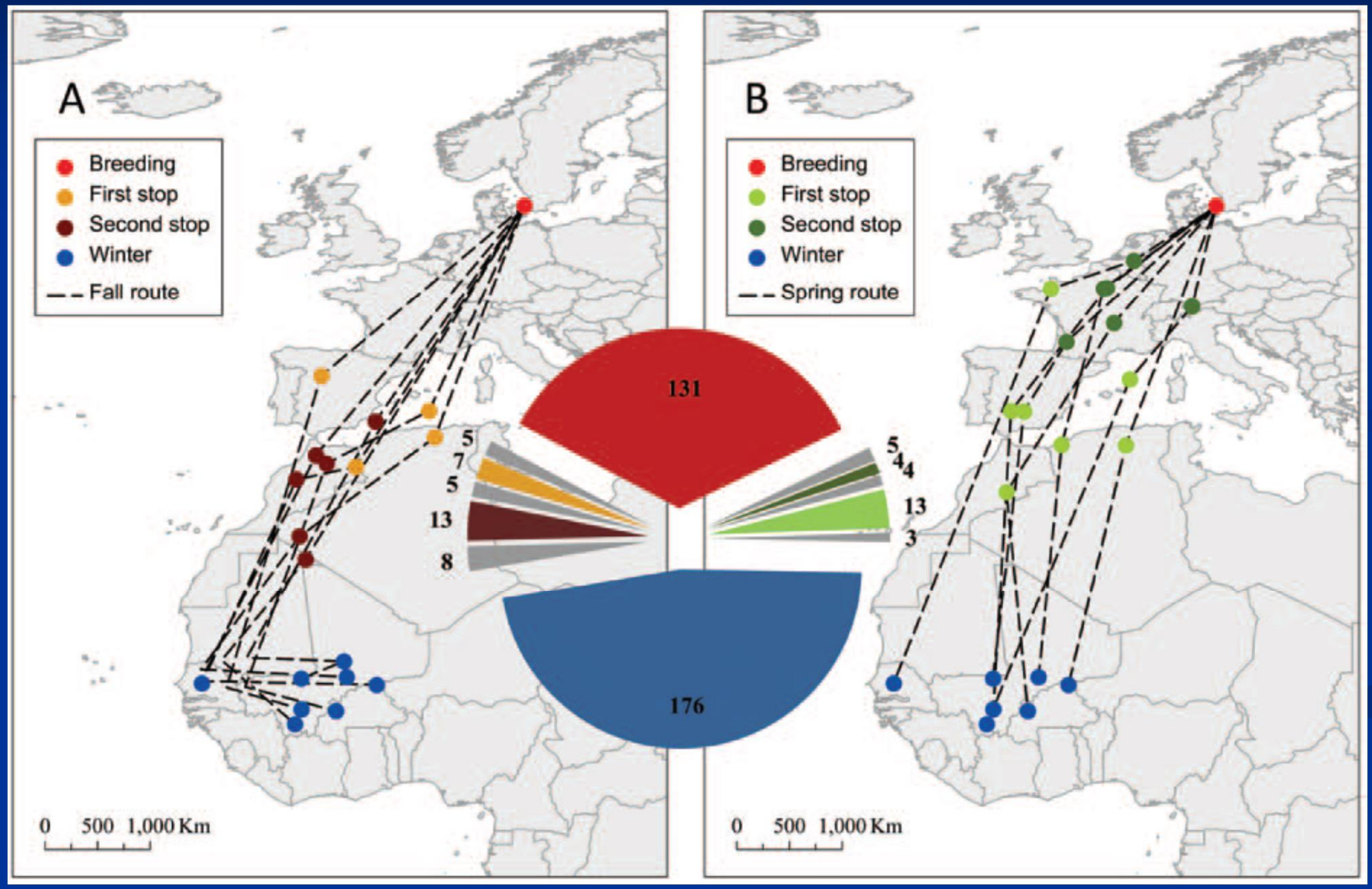


[illegible] (tj lztaj lztadz, j dzOfrjstsuf-cj 2500 f-dz3L⊙5 frjzlstsf-)

J j frj dzdzw dz3cj gtaOycjw

l cj dz3dzdj tj j tajj dz3jh j dzdjw

Migration of the Common Redstart: a Eurasian songbird wintering in highly seasonal conditions in the West African Sahel (Kristensen et al. 2013)



ID	Winter departure 2011	Winter departure 2012	Difference (days)	Breeding arrival 2011	Breeding arrival 2012	Difference (days)
273 = 007	14-Mar	03-Apr	20	13-Apr	21-Apr	8
277 = 009	27-Mar	18-Apr	22	19-Apr	07-May	18
278	02-Mar			19-Apr		
003		02-Apr			30-Apr	
Average	14-Mar	07-Apr	24	17-Apr	29-Apr	12

The birds had a significantly later departure from the winter site in 2012 than in 2011 ($P = 0.046$) and similar later arrival to the breeding grounds ($P = 0.057$).

Neither of these 2 was winter-site faithful. They moved 12º and 3º longitude east, respectively, from the first to the second year.

ˌ ʘʢ ʤ ɰʝ ʤʆʝ

- ʊ tɕʘʜʗ ɥʗtsʣʤ ʝ ʤʝ lstsʜʳ tɕʝ ɢʗʄlstɕʘɥʗʗ ʄtʝtsʢtsɘ ʤʗɢtɕʘɥʗʗ ʧlsʗɥ ʄŋʧtsʤsʱ ʙʗʤsʢʤʷ ʗʤʗ tslsʤsɘʘʤ ʧtslsʝ tɕʷʤʗ ʄɒtsʝ ʡ ʘʢlsʐʘʤ ʤsʄlsʗ ʜts ʄŋʗ ʧtstɕ, ʤ ʄŋʤslstɕʷ ʤʘʧ tsʷɘʤ ʤʆʝ ɘʳ ʄtsʢtslsʝ ʤsʤsɢʗɥʤ ʄŋʧtsʄtsʙtsɘ ʢtsʤstɕtsʤʷ ʟʘ ʤʗɢtɕʗtɕʐʶ ʱ ʗʤʗ tsʄtsʙʷʤʗ. ɺ ʧʝ tɕɘlʐʶ tsɰʝ tɕʝ ʜᴵ ʗ ʤ tsʙtsʜʗʤs ʧtɕʗʤʝ ʤʷlsᴵ ʧtɕʗ ʜtsʤɢtsɘtɕʝ ʤʝ ʤʤsʤ ʤtsʤʆlststɕʗʤʝ ʟʘtslsʤ lstsʤʗ ʧtɕʗʤ lstsʤ ʧlsʗɥ
- ʉ ʧʐlsʤʗʢtsɘtsʝ ʄŋʤ ʞʝ ʤʆʝ ʟʘʤʗɢtɕʗtɕʐʶ ʱ ʗʤʗ ʧlsʗɥʘʤʗ ʜʘʝ ls ʤʘʗʙtsʤʝ lstsɥʤʐʶ ʗʤʷ tstɕʤʘɥʗʶ ʤ lstsʤ ʢts ts ʄtʝtsʢʘ ʤʘɥʘʤʘʗʤʗ tsʢtsʤʘʤʗʷ ʤʗɢtɕʘɥʗʗ, ʤs ʗ ʧtsʟɘtsʤʷʝ ls ʐʄlsʘʤsɘʗlsᴵ ɘʝ ʄŋ ʤʘtɕʱ tɕʐls ʗ ʜɘʗʞʝ ʤʗʷ ʗ ʤʝ ʄlsʘ tsʄlsʘʤsɘtsʢ, ʘlsʘʢʞʝ ʗ ʧtɕtsʜtsʤ ʗlsʝ ʤ ʤsʄlsᴵ . ɺ ʤʘɢtsʜʘtɕʷ ɺ lstsʤʐ ʤʝ lstsʜʐ ʐʜʘʤsʄŋ ʜtsʢʘʟʘlsᴵ , ɥlsts ʄtʝtsʢʗ ʤʘɥʘʤʘ ɘʝ ʄŋ ʤʤ ʡ ʤʗɢtɕʘɥʗʗ ʜʘʤ ʤʗ ʤʗɢtɕʘʤstsɘ ʧtsʤʗʤs ʷtslstsʧʝ tɕʗtsʜʘʗ ɘtɕʝ ʤʝ ʤʤsʡ ɺ ʤʜtsɢʝ ʤʤsʡ ʧtɕtsɢtɕʘʤ ʤsɢʐls ɘ ʟʤʘɥʗlsʝ ʤ ʤsʡ ʤʝ tɕʝ ʢtsʤstɕtsʤʗtɕtsɘʘlsᴵ ʄŋʷ ɘʤ ʱ ʤʗʤʗ ʷʘʢlststɕʘʤʗ ʄtʝ ʜʳ , lsʘʢʗʤʗ ʢʘʢ lsʝ ʤʧʝ tɕʘlsʐtɕʘ, ɘʤʘʞ ʤsʄlsᴵ , tsʙʗʤʆʝ ʢtstɕʤʘʗ ʜtɕ.


Всем спасибо за внимание