

Distribution of racer goby along the cross section of a dam reservoir on the lower Vistula River (central Poland)

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Racer goby *Neogobius gymnotrachelus*



- Native to the Ponto-Caspian region
 - In the Vistula River recorded for the first time in 2000
 - Size: ♂ 16.1 cm, ♀ 13.3 cm; age: 4-5 lat
 - Opportunistic feeding strategy
 - Multiple spawning (2-3); parental care of eggs by males
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- **Kostrzewa, J.; Grabowski, M., 2001:** Babka łysa (gołogłowa), *Neogobius gymnotrachelus* (Kessler, 1857) (Gobiidae, Perciformes) – nowy gatunek ryby w Wiśle. *Przeg. Zool.* 45, 101–102.
 - **Pinchuk V.I, ED Vasil'eva, VP Vasil'ev, P Miller, 2003:** *Neogobius gymnotrachelus* (Kessler, 1857). In: *The freshwater Fishes of Europe. Vol. 8/I Mugilidae, Atherinidae, Atherionopsidae, Blennidae, Odontobutidae, Gobiidae 1.* P. J. Miller (Ed.). AULA-Verlag, Wiesbaden, Germany, pp. 264–279
 - **Smirnov AI, 1986:** *Fauna Ukrainy, 8. Ryby, 5.* Naukova Dumka, Kijev

Distribution in large rivers

▶ studied in near-shore habitats only

- electrofishing
- seine nets

▶ not explored in off-shore areas

- **Danilkiewicz Z**, 1996: Babka łysa (gołogłowa), *Neogobius gymnotrachelus* (Kessler, 1857) Perciformes, Gobiidae – nowy gatunek w ichtiofaunie zlewiska Morza Bałtyckiego. Kom. Ryb. 2, 27–29
- **Erős T, A Sevcsik and B Tóth** 2005: Abundance and night-time habitat use patterns of Ponto-Caspian gobiid species (Pisces, Gobiidae) in the littoral zone of the River Danube, Hungary. J. Appl. Ichthyol. 21, 350–357
- **Jurajda P, J Čern, M Polačik, Z Valová, M Janáč, R Blažek and M Ondračková**, 2005: The recent distribution and abundance of non-native *Neogobius* fishes in the Slovak section of the River Danube. J. Appl. Ichthyol. 21, 319–323
- **Kostrzewa J, Grabowski M**, 2001: Babka łysa (gołogłowa), *Neogobius gymnotrachelus* (Kessler, 1857) (Gobiidae, Perciformes) – nowy gatunek ryby w Wiśle. Przeg. Zool. 45, 101–102
- **Wiesner C**, 2005: New records of non-indigenous gobies (*Neogobius* spp.) in the Austrian Danube. J. Appl. Ichthyol. 21, 324–327

Fishing

Traps made of used up car tyres



Float

Rope

Trap



Advantages:

- ▶ Simple and cheap
- ▶ Resistant to water current
- ▶ Suitable for soft bottom areas
- ▶ Suitable spawning substratum

Disadvantages:

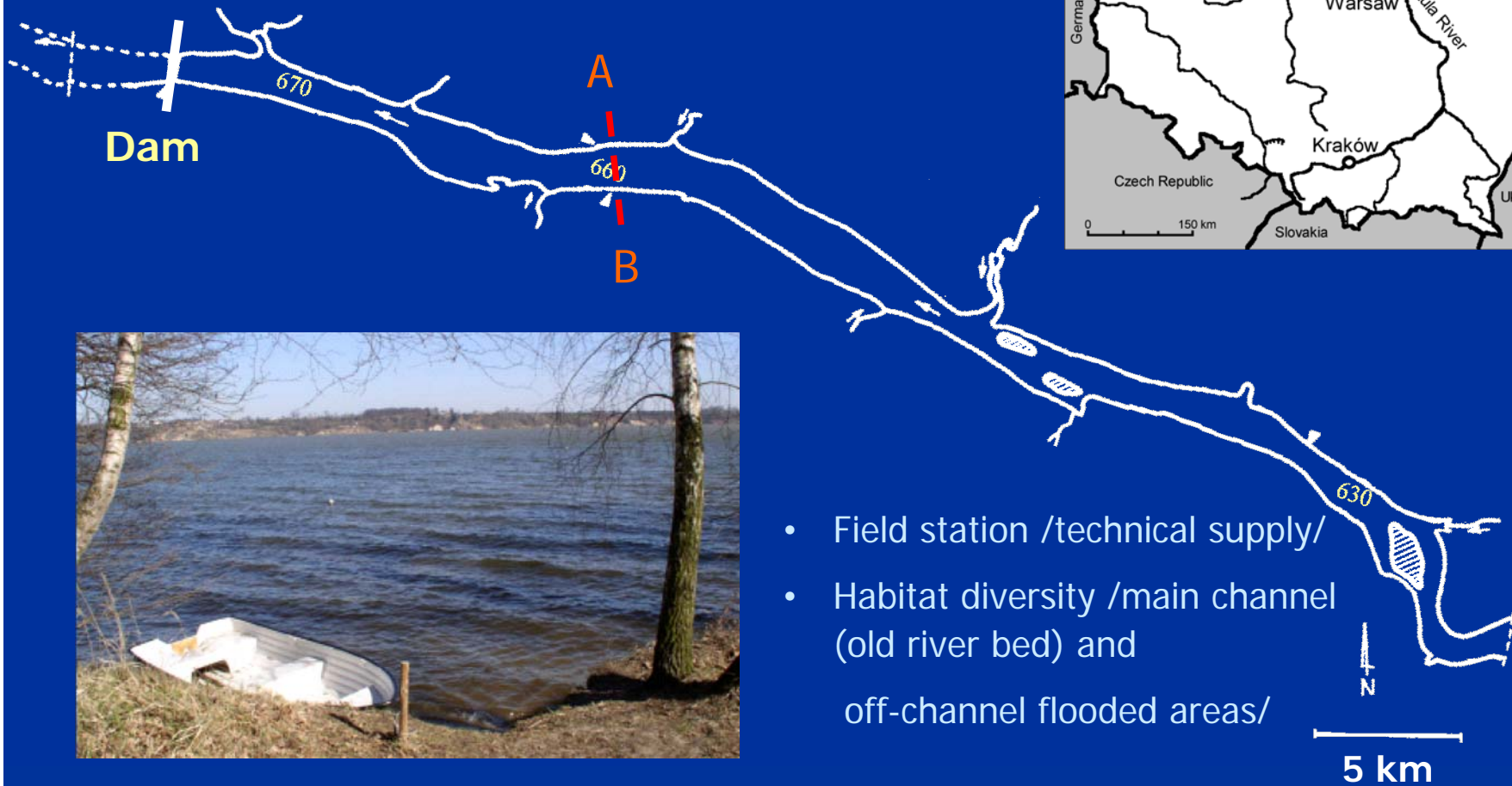
- ▶ Unknown fishing selectivity and effectiveness

? Working as a shelter

Authors – fishermen from Black Sea (K. Skóra – pers. comm.)

Study area

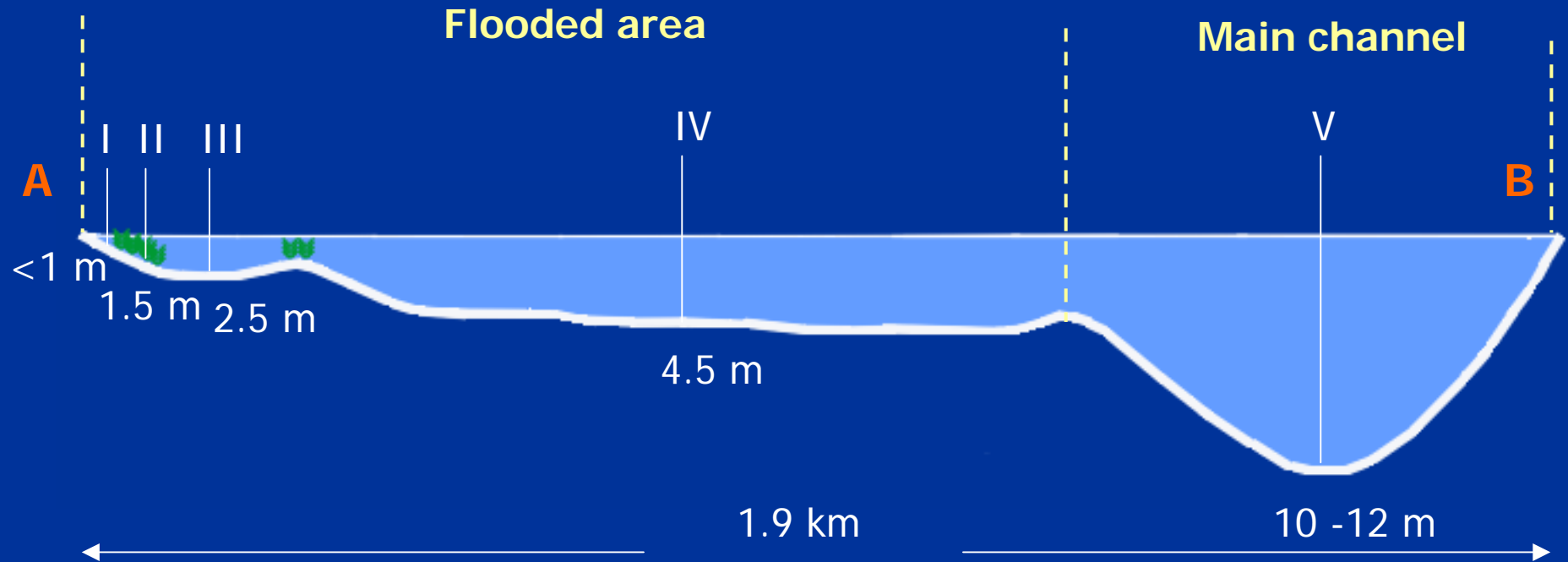
Cross section (A-B) of the Włocławek Reservoir
(661. km river course)



- Field station /technical supply/
- Habitat diversity /main channel (old river bed) and off-channel flooded areas/

Study sites

Cross section profile



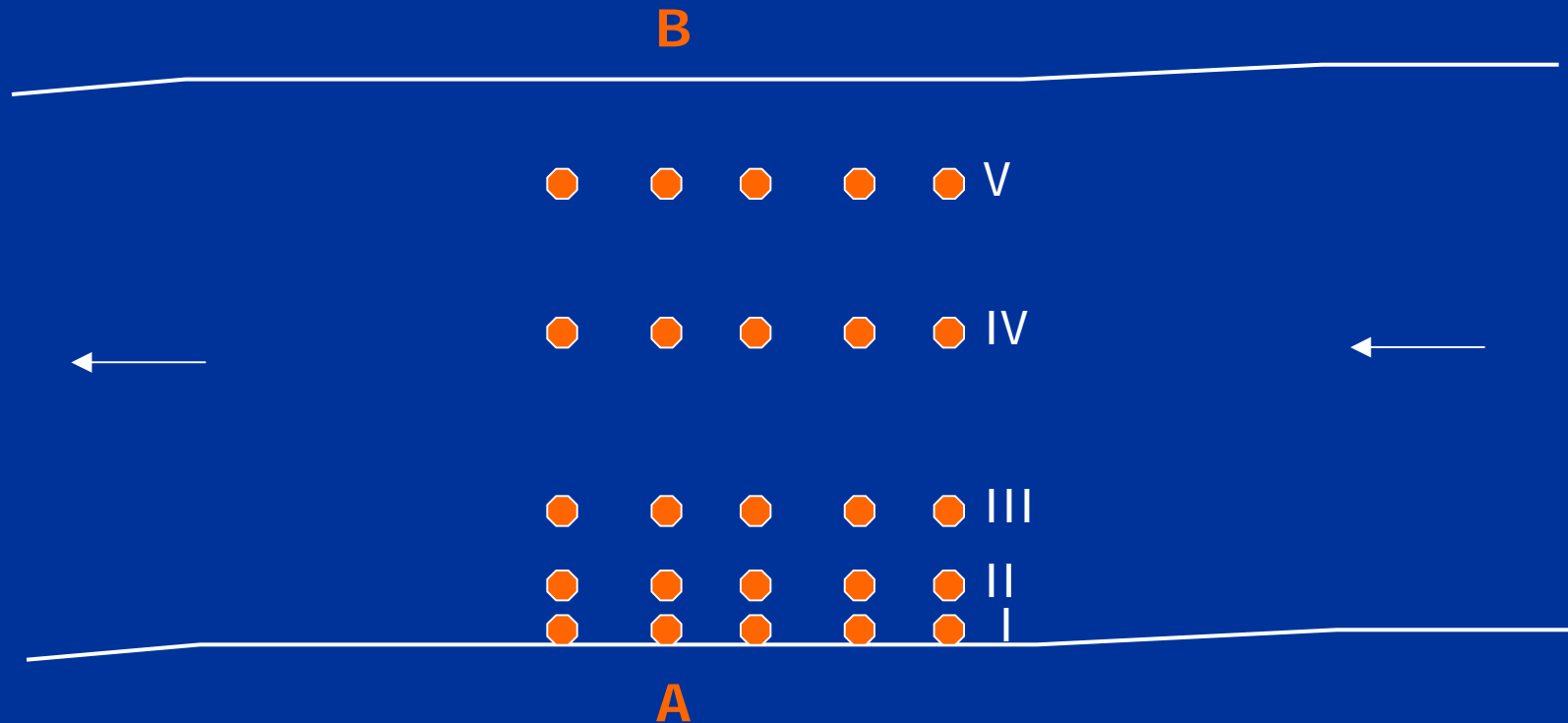
I – sand

II – sand/mud with macrophytes

III-V – mud



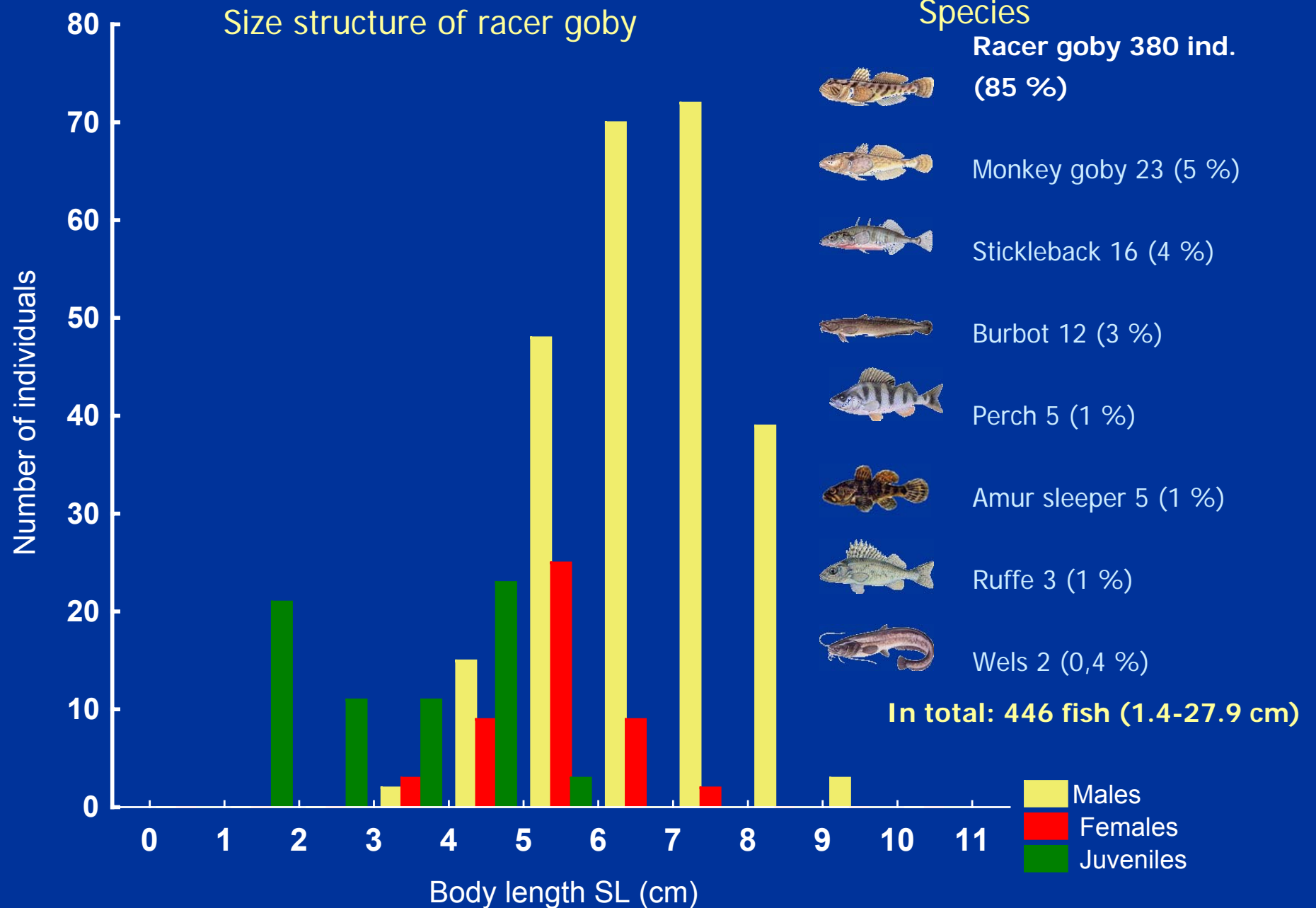
Sampling



- 25 traps (5 at each site)
- 23 samples taken from April to October, every 7-11 days.
- water transparency, near bottom temperature and oxygenation measurements

- Material was divided into 3 groups:
 - 1 April – 15 June: **spring** (spawning time)
 - 16 June – 31 August: **summer**
 - 1 September – 31 October: **autumn**

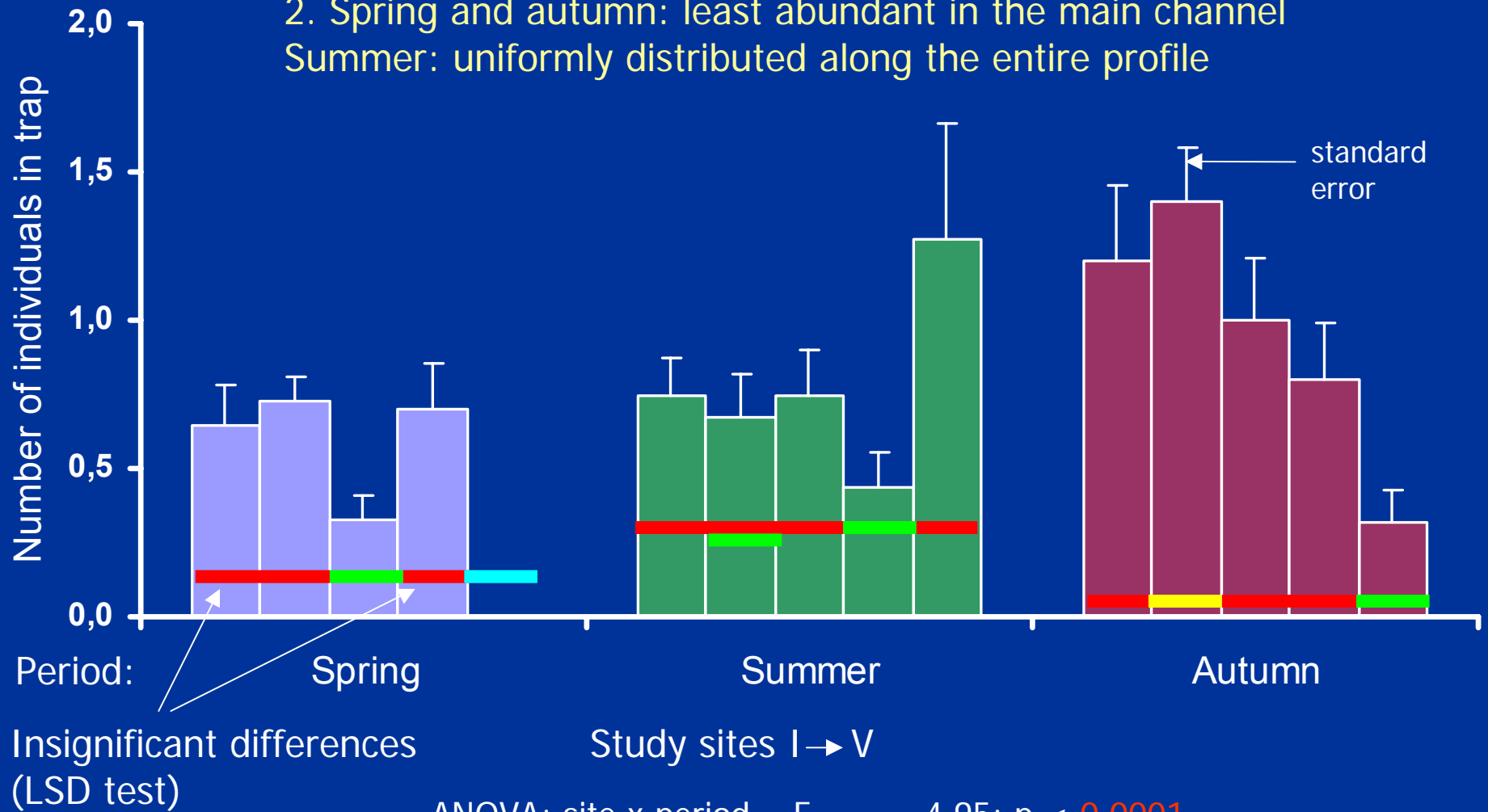
Species composition



Horizontal distribution

Racer goby:

1. Occurred along the entire reservoir profile
2. Spring and autumn: least abundant in the main channel
Summer: uniformly distributed along the entire profile



ANOVA: site x period $F_{8, 399} = 4.95; p < 0,0001$

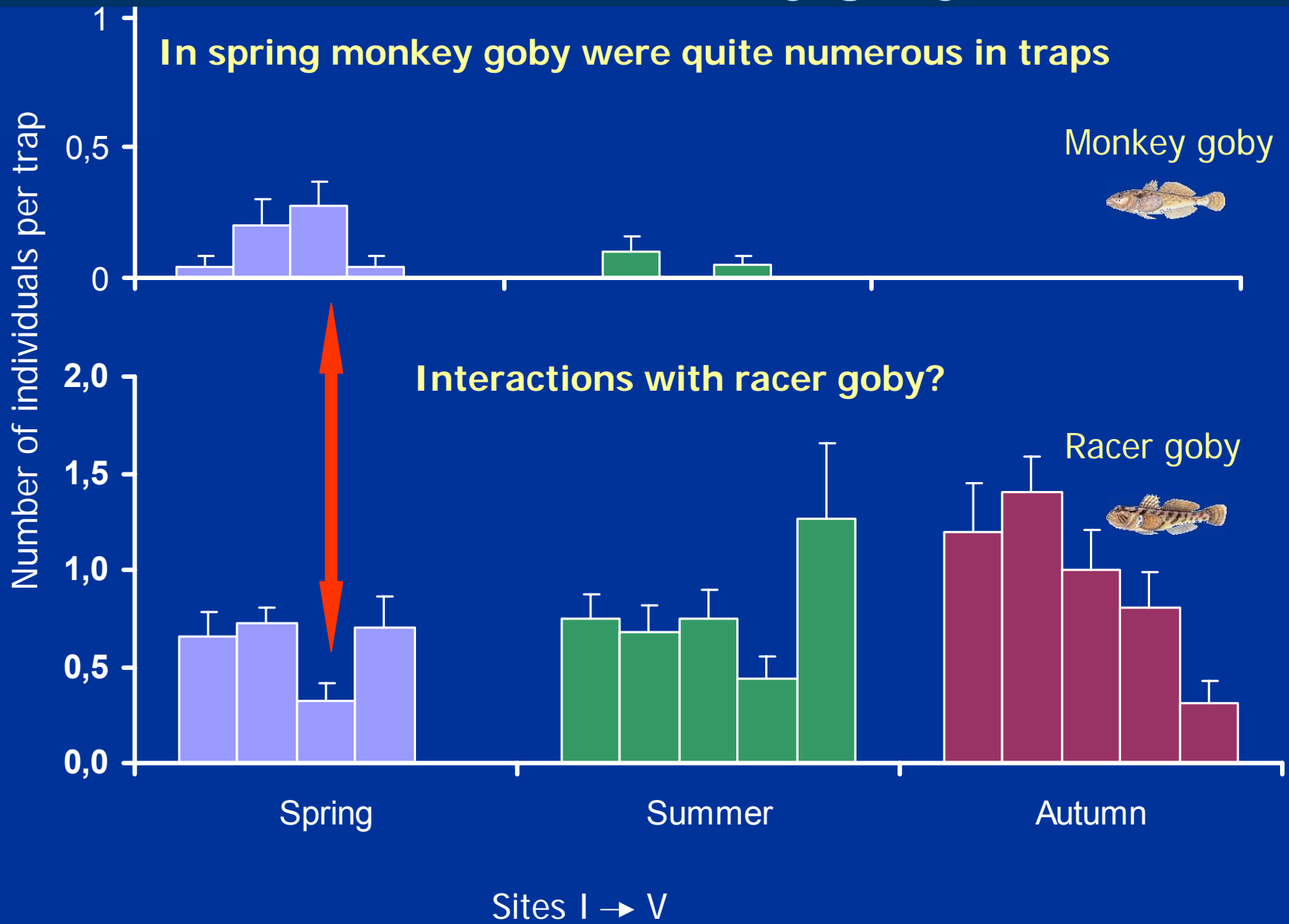
Factors

Which factors affected the distribution of racer goby in traps/shelters?

- The presence of monkey goby ✓
- Near bottom oxygenation ✓
- ~~Water transparency~~
- ~~Water temperature~~

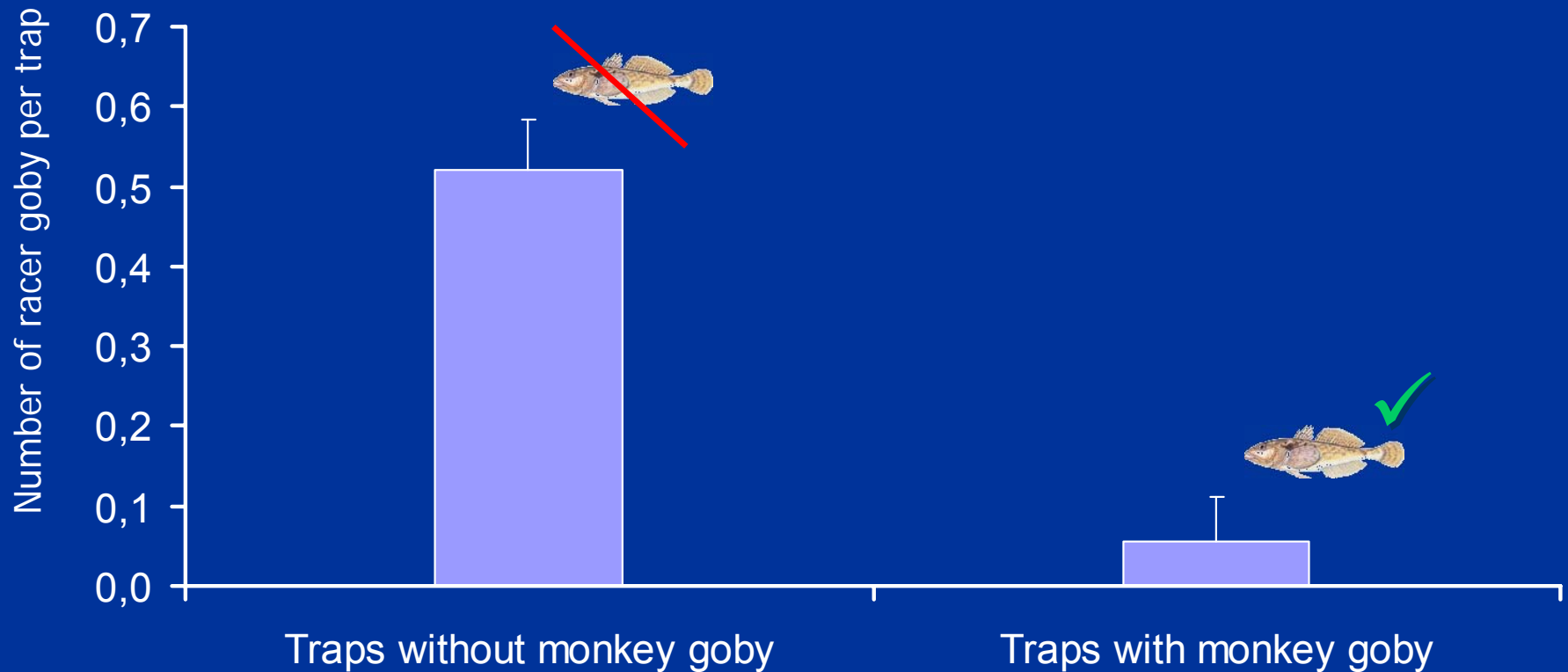
Racer and monkey goby

In spring monkey goby were quite numerous in traps



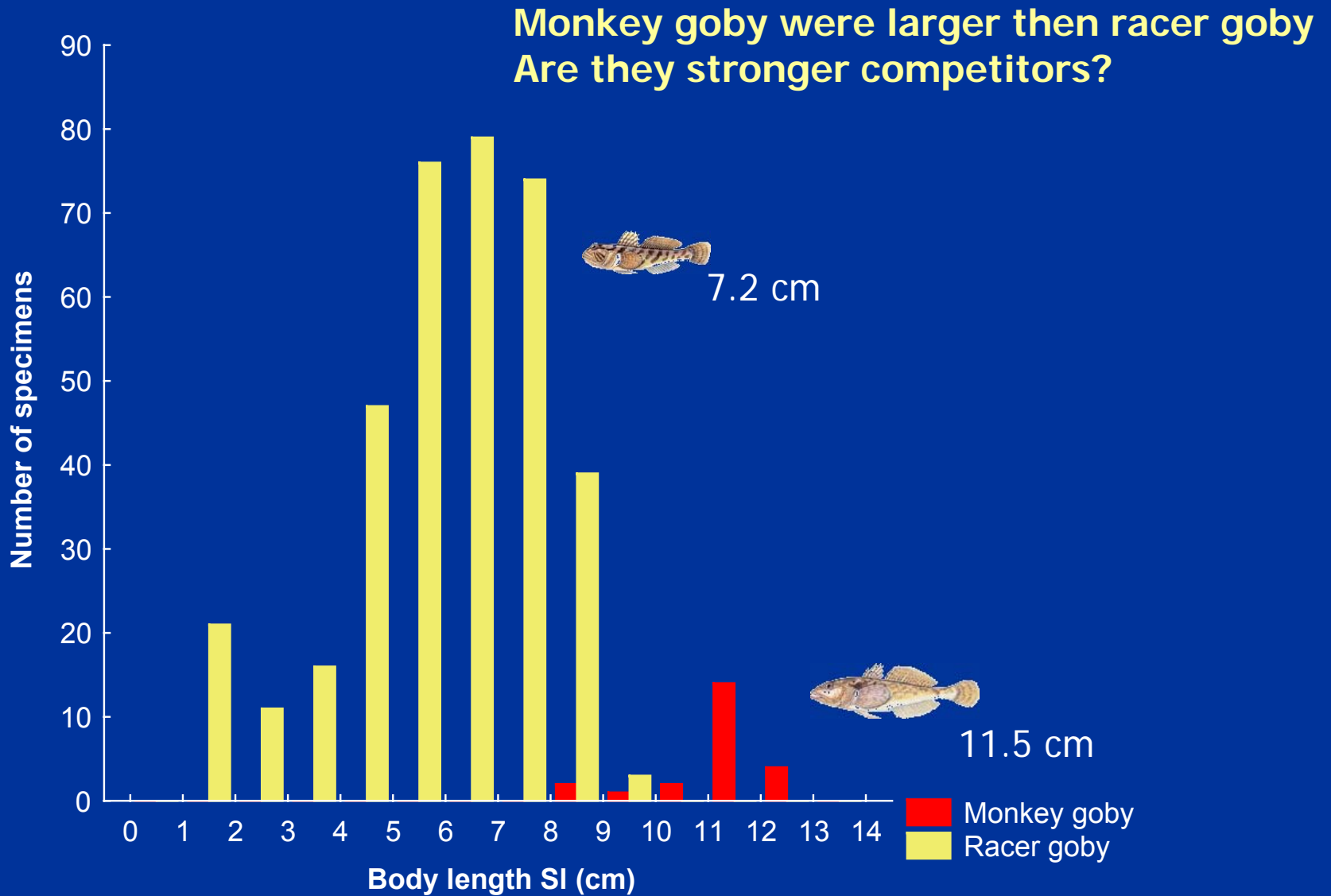
Racer and monkey goby

Racer goby were significantly less numerous in traps occupied by monkey goby



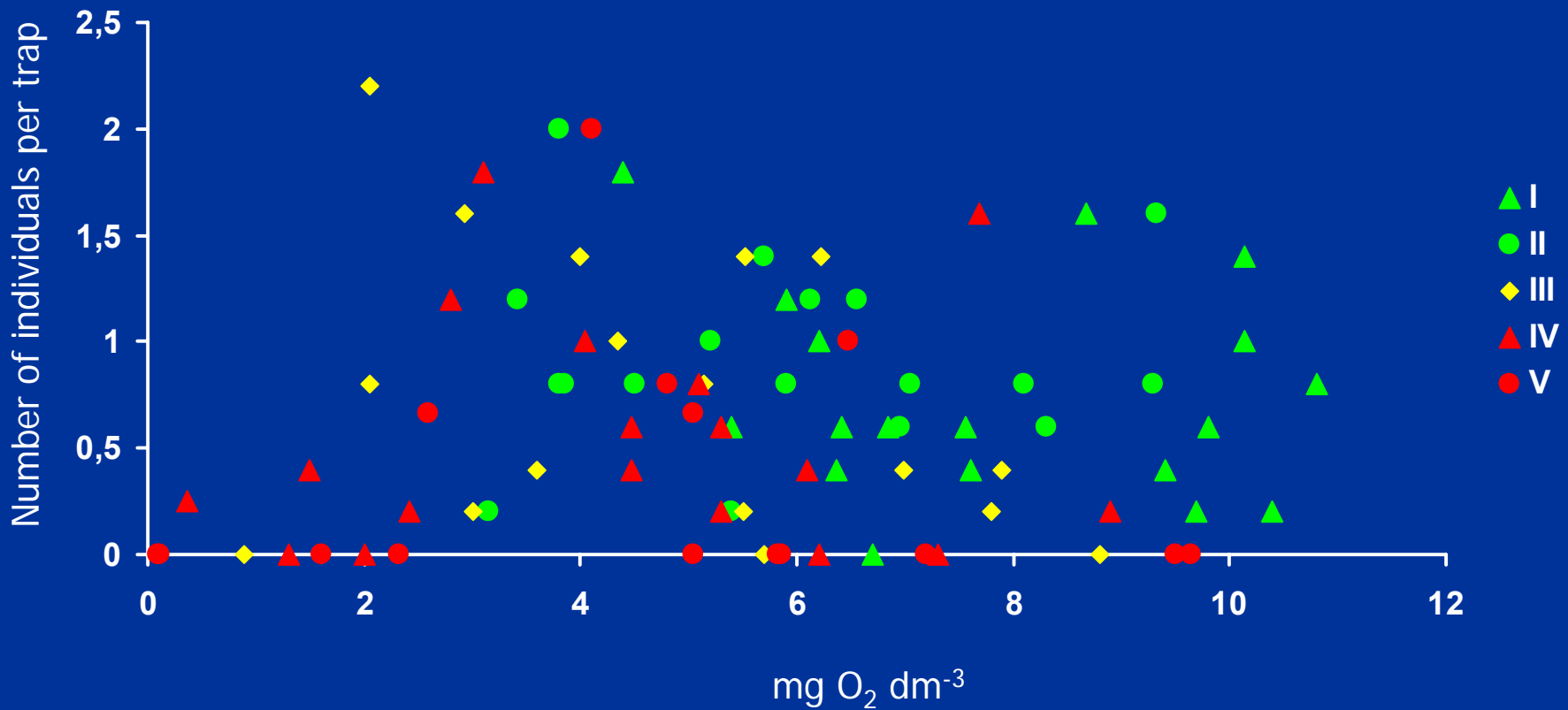
ANCOVA: $F_{1,142} = 9.64$, $p = 0.0023$

Size of monkey and racer goby



Oxygen concentration

1. Below *ca.* 2 mg/l O₂ – small number of racer goby
2. Nearshore waters – good oxygenation



ANCOVA:

$F_{1.69} = 19.14, p < 0,0001$

Covariate oxygen concentration

Conclusions

Włocławek Reservoir

1.

Spawning

Near-shore zone
(with
macrophytes)



Near-shore zone
(without
macrophytes)



Central part
(flooded area)



No spawning

Main channel
(old river bed)



2.



Monkey goby



Racer goby

Competition for spawning sites

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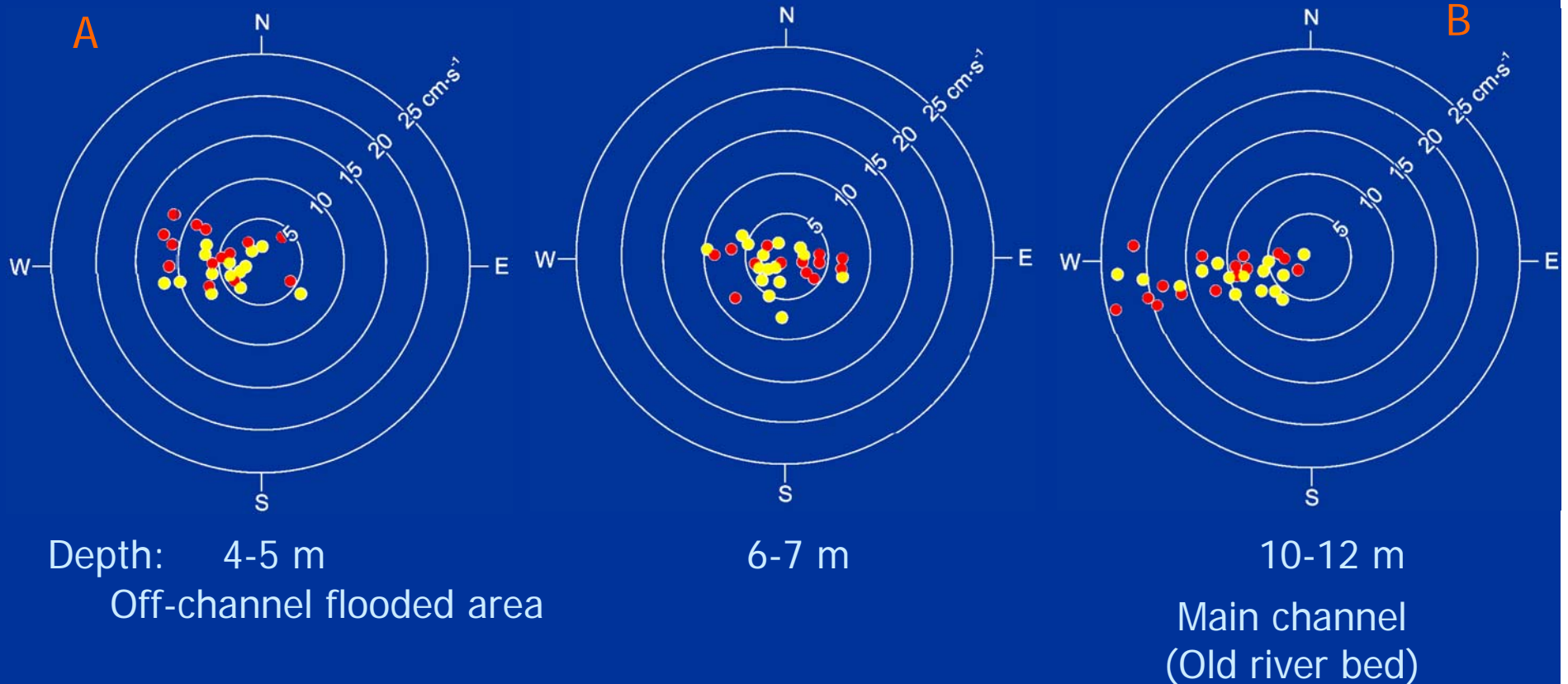
- for making photographs

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Thank You

Water flow

Velocity and direction of water current at study area



- **Yellow dots** – near surface; **Red dots** – near bottom
 - 2003-2004 years
- Gierszewski** (unpublished data)