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Session B8: Swimming Behaviour of Beluga and Stellate Sturgeons During Their Migration in the Lower Danube River

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Swimming behaviour of beluga and stellate sturgeons during their migration in the Lower Danube River

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Danube River:

- is Europe's second longest river, located in Central and Eastern Europe.

- length 2,860 km (1,777 mi)

- discharge: before delta - average 7,000 m³/s (247,203 cu ft/s)

- before reaching the Black Sea it forms Danube delta - the largest delta in the EU



Beluga sturgeon (*Huso huso*)

- Caspian and Black Sea basins, occasionally in the Adriatic Sea
- Heavily fished for the valuable roe (**beluga caviar**)
- huge and late-maturing fish, can live for 118 y
- The largest record is of a female taken in 1827 in the Volga estuary at **1,571 Kg** (3,463 lb) / **7.2 m** (24 ft)
- usually TL= 200–250 cm (6.56–8.2 ft) / TW= 100–150 kg (220–330 lb), (Otel 2007)



Stellate sturgeon (*Acipenser stellatus*)

- native to the Black, Azov and Aegean Sea basins
- reaches about TL= 218 cm (7.1 ft)
- TW up to 54 Kg (119 lb).^[2]
- common size is **100-120 cm** (3.2–3.9 ft) / **6–8 kg** (13.2–17.6 lbs), (Otel 2007)
- it is a slim-bodied fish easily distinguished from other sturgeons by its long, thin and straight snout



Materials and methods:

Acoustic telemetry equipment (by Vemco):

Submerged automatic acoustic receivers (7)

VR2 W



Acoustic transmitters (9) V16TP-6x-069k
(with depth and temperature sensors)

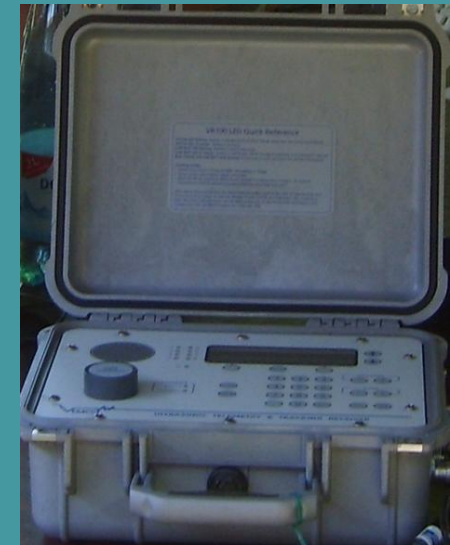


Tag detection transmitters (2)
V16-6x-060k-2

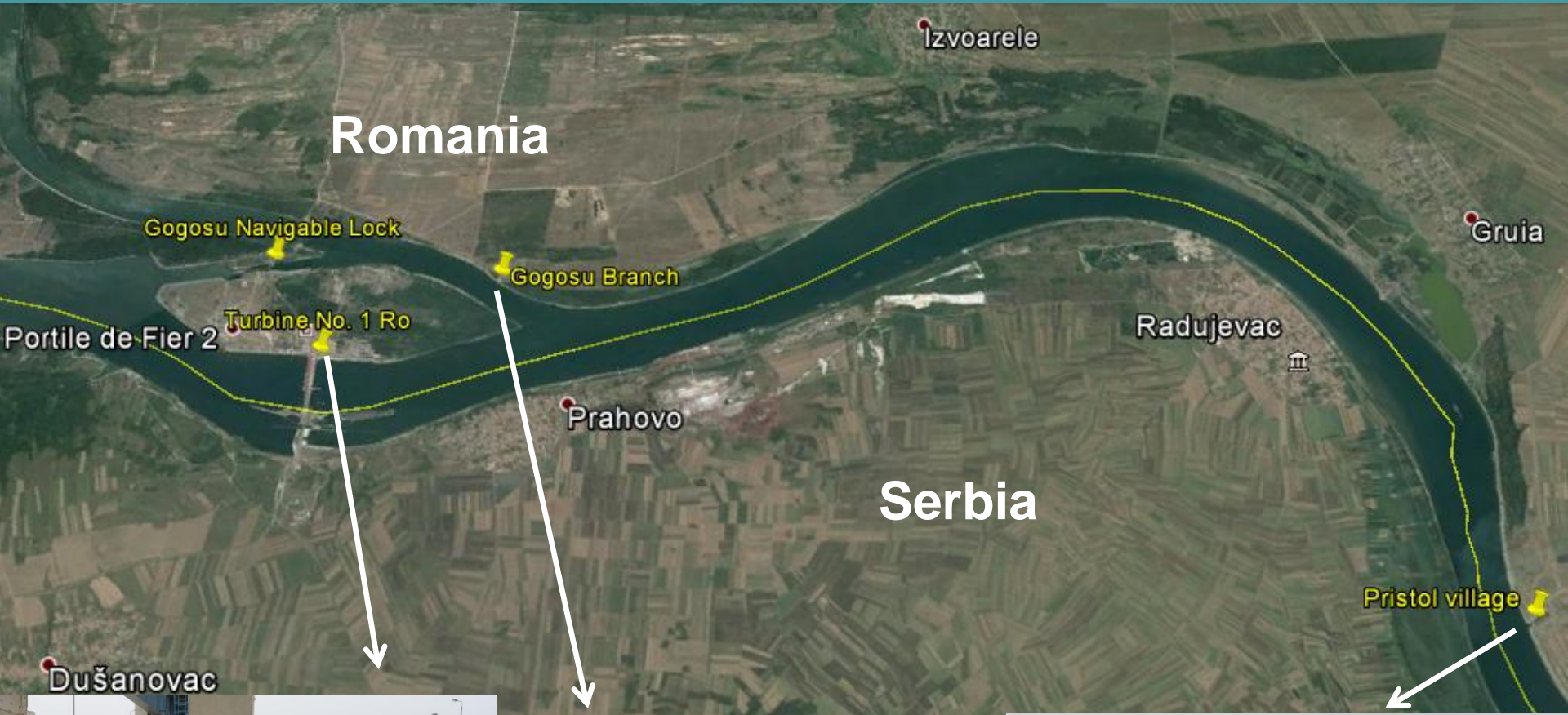


Mobile receiver / active tracking

VR-100



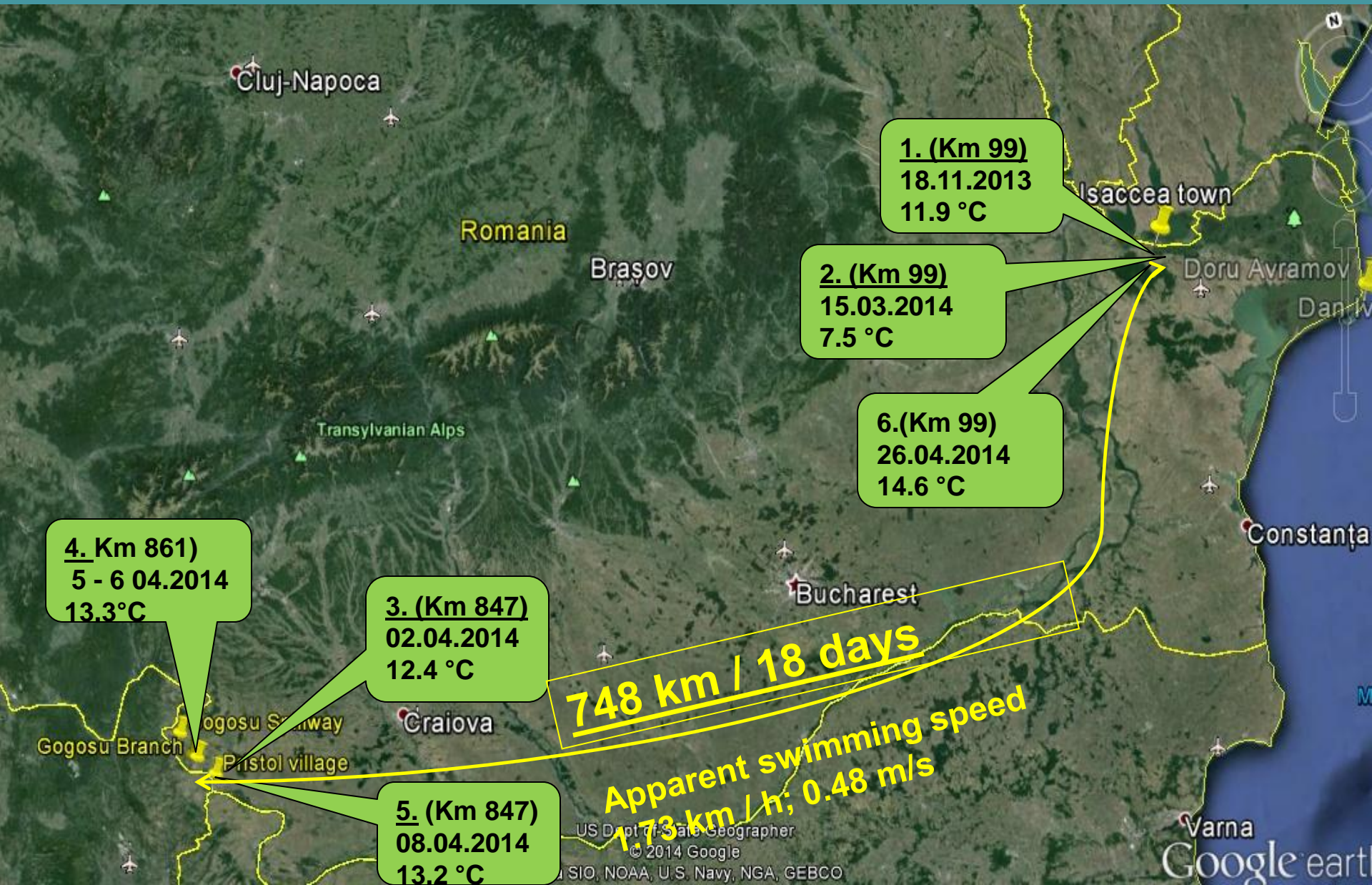
VR2W receivers installed close to Iron Gate 2 Dam



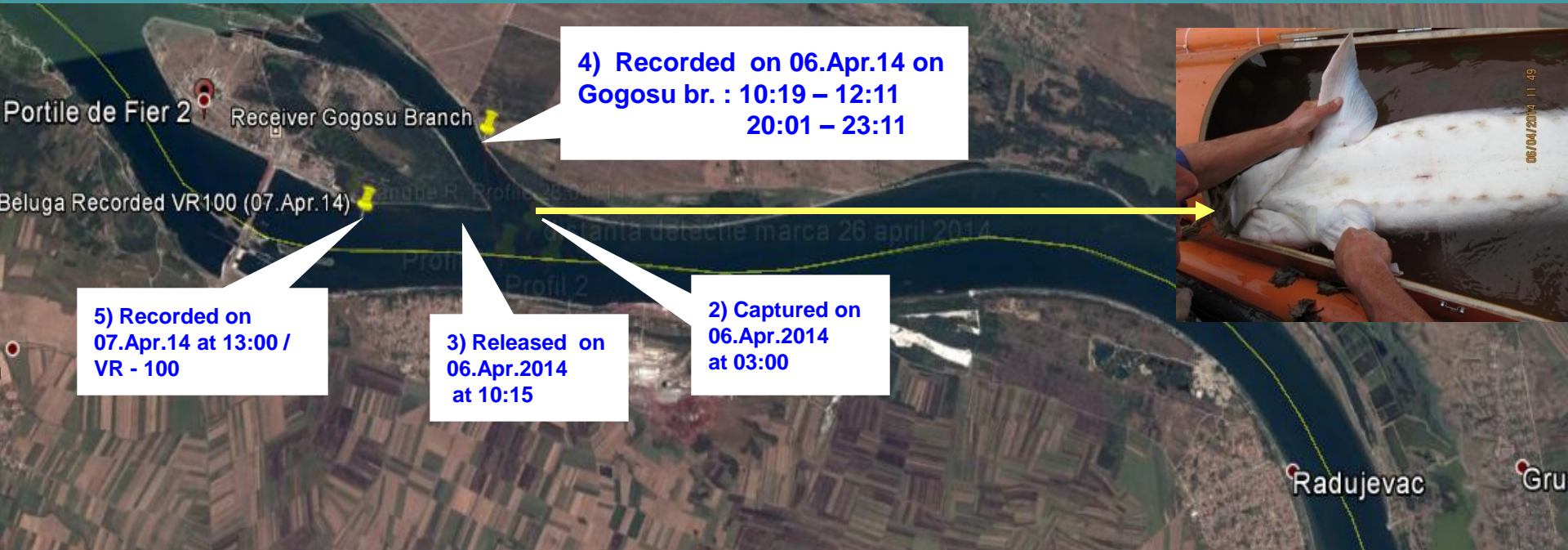
Beluga sturgeon ♂ - captured on 06 April 2014



Overview of longitudinal movements / beluga sturgeon (Nov. 2013 - April 2014)



Movements of beluga sturgeon / d/s Iron Gates II



4) Recorded on 06.Apr.14 on Gogosu br. : 10:19 – 12:11
20:01 – 23:11

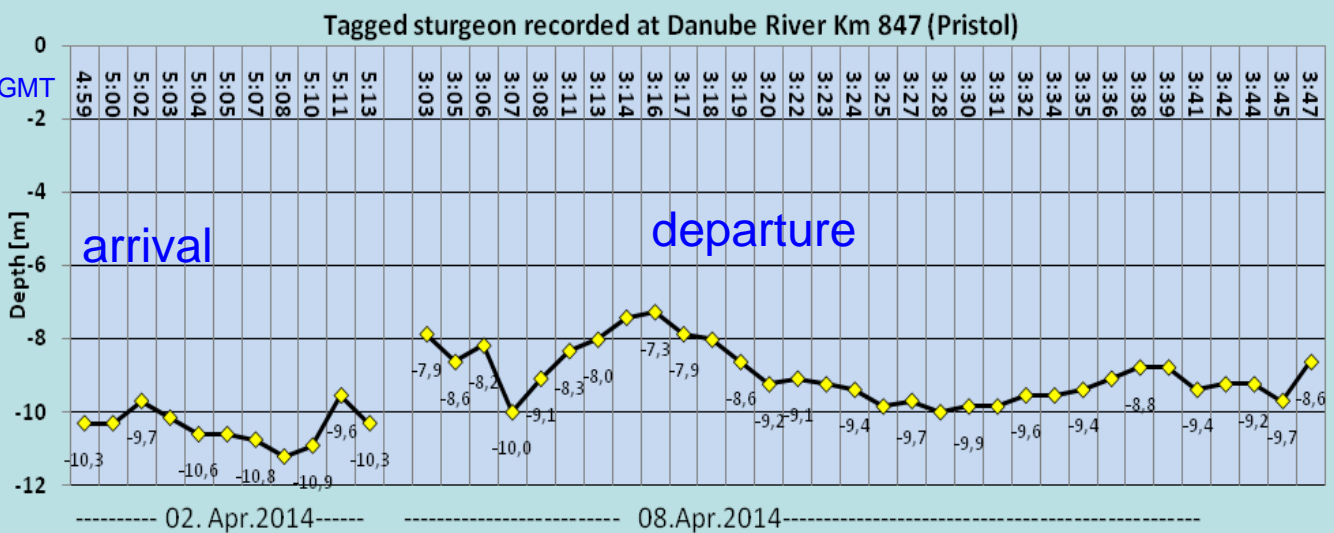
5) Recorded on 07.Apr.14 at 13:00 / VR - 100

3) Released on 06.Apr.2014 at 10:15

2) Captured on 06.Apr.2014 at 03:00

Radujevac

Gru

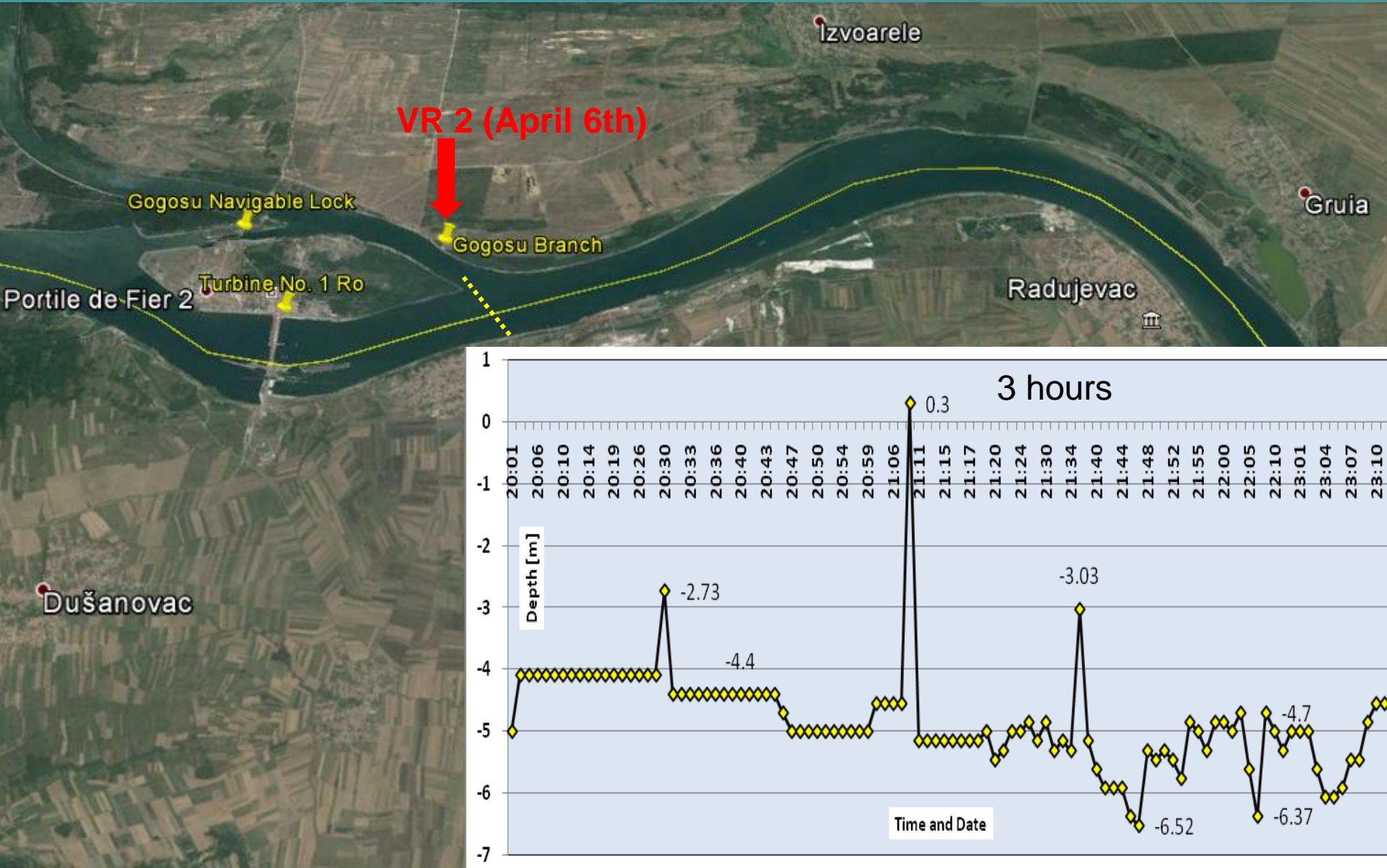


6) 08.04.2014
06:03 – 06:47
Pristol D.R. Km 847
(twater 13,2°C)

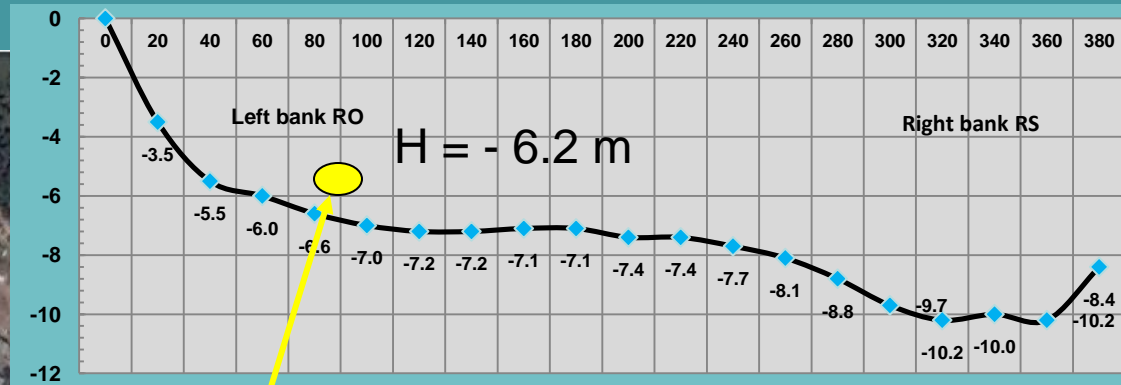
1) 02.04.2014
08:00 – 08:13
Pristol D.R. Km 847
(twater 12,4°C)

Receiver Pristol

Beluga sturgeon surfacing & jumping behaviour d/s Iron Gate 2 tail race



Manual tracking / beluga male (2014, April 7th)



Clear Table Abort

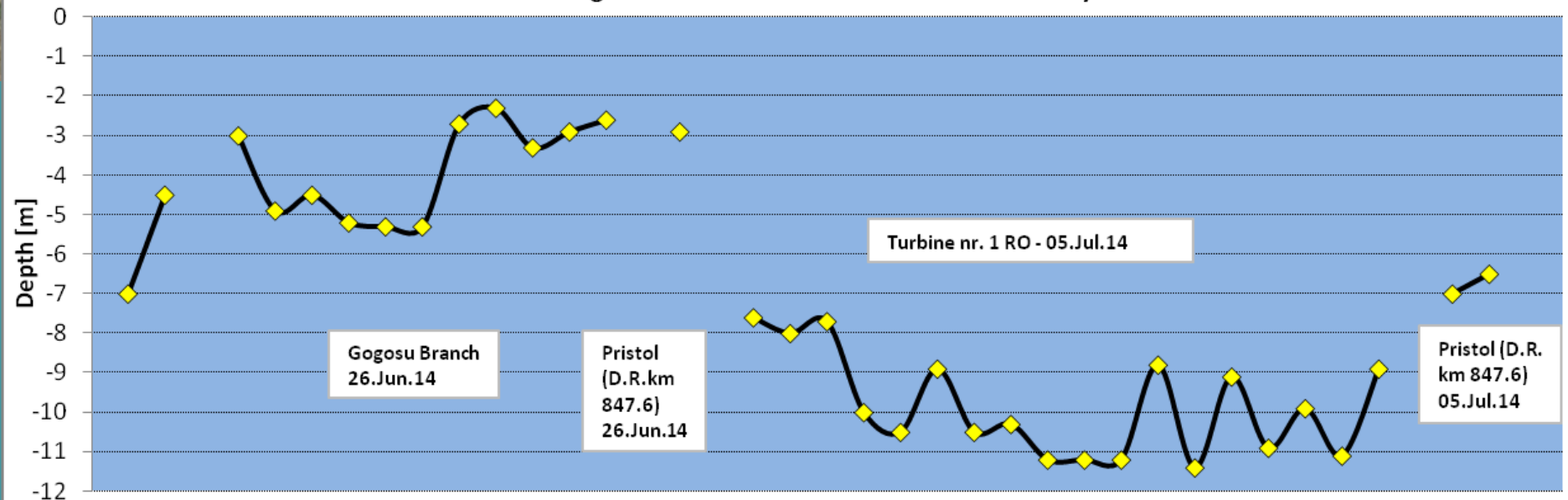
System Events: 282 Detections: 26
 Latest: 2014-04-17 08:03:01 [VR100 time]

Date	Time	Chan	Freq (kHz)	Type	Code Space	ID	S/N	Data1	Units1	Data2	Units2	Latitude	Longitude
2014-04-07	13:37:23.333	1	69	Coded Sensor	A69-9002	13730	1148544	13.2	°C			44.30151	22.58266
2014-04-07	13:36:53.785	1	69	Coded Sensor	A69-9002	13731	201148544	6.4	m			44.30165	22.58219
2014-04-07	13:35:43.076	1	69	Coded Sensor	A69-9002	13731	201148544	6.2	m			44.30192	22.58110
2014-04-07	13:35:17.746	1	69	Coded Sensor	A69-9002	13730	1148544	13.2	°C			44.30201	22.58074
2014-04-07	13:34:39.300	1	69	Coded Sensor	A69-9002	13731	201148544	6.2	m			44.30211	22.58016
2014-04-07	13:33:07.240	1	69	Coded Sensor	A69-9002	13731	201148544	6.2	m			44.30214	22.57977

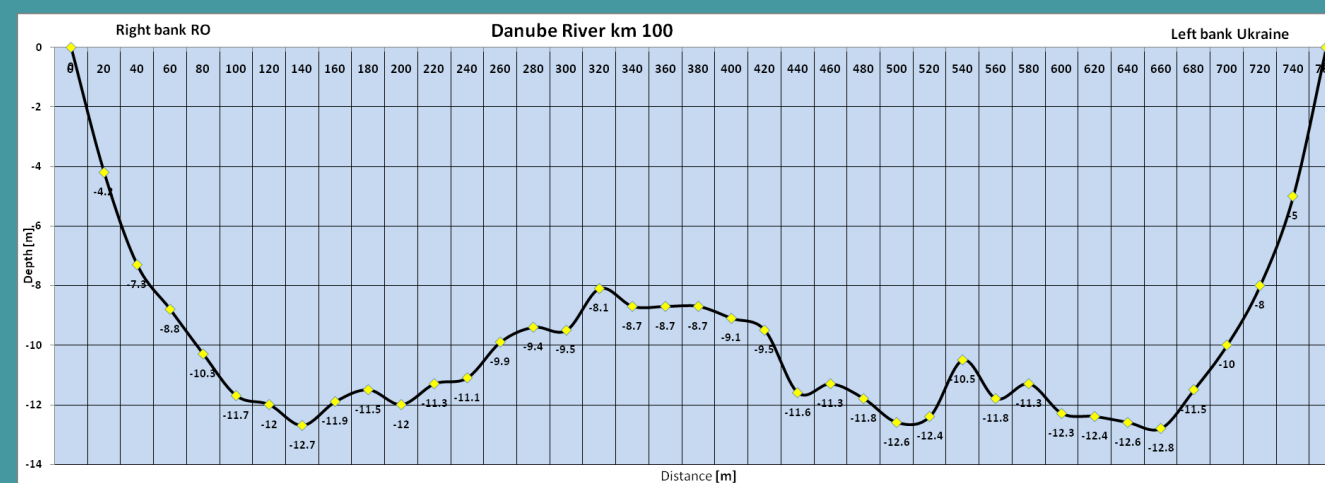
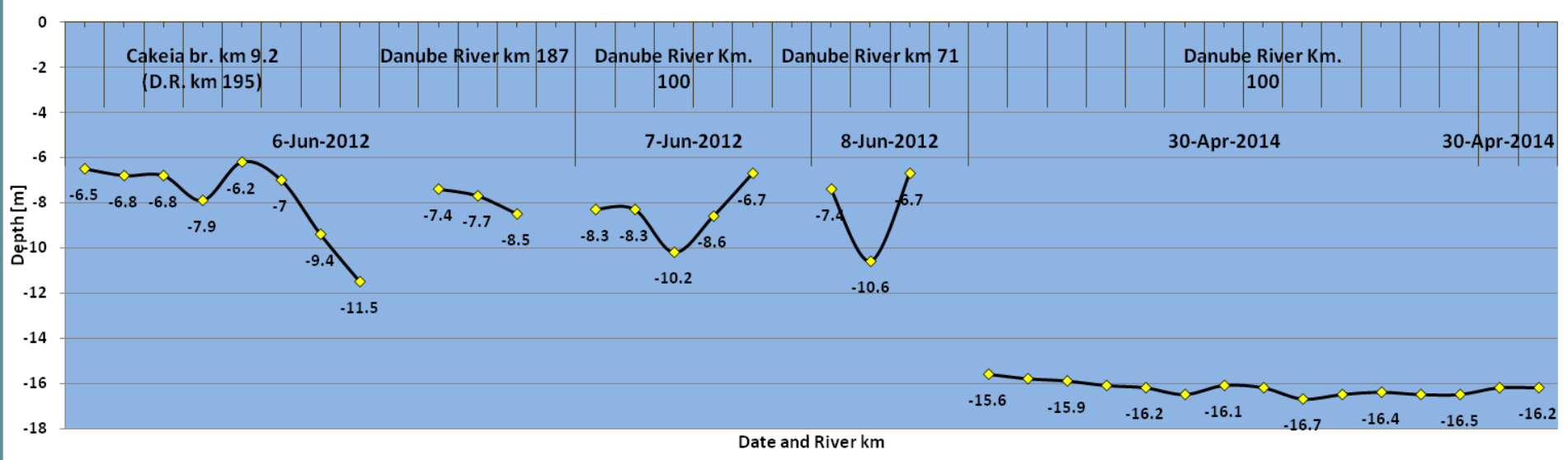
Stellate sturgeon swimming depths recorded downstream Iron Gate 2 Dam in June & July 2014



Stellate sturgeon recorded at the IG 2 Dam - June-July 2014



Stellate sturgeon swimming depth returning to the river after 2 years for spawning



Conclusions

1. Beluga and stellate sturgeons

- still arrive downstream of the Iron Gates 2 HP dams;
- swim upstream following the bottom of the river.

2. Beluga sturgeon males:

- swim upstream 748 Km in 18 days; and returned back in the same numbers of days;
- are returning in the river for spawning every 3 years.

3. Stellate sturgeon male:

- were returning in the river for spawning after 2 years;
- was recorded by the receiver installed at turbine #.1

Acknowledgements:

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-Partners for Water – Programme / The Netherlands



-ICPDR Secretariat, Vienna



Access:

Hidro -Electrica S.A. Drobeta Turnu Severin



Tagging beluga sturgeon: Alex Cristea & Alin Badilita - ROMOMED project / NIRDEP – Bucharest / AFDJ Galatz



Fisherman capturing Beluga sturgeon: **Ionel Cârjoi**





Thank you for your attention !