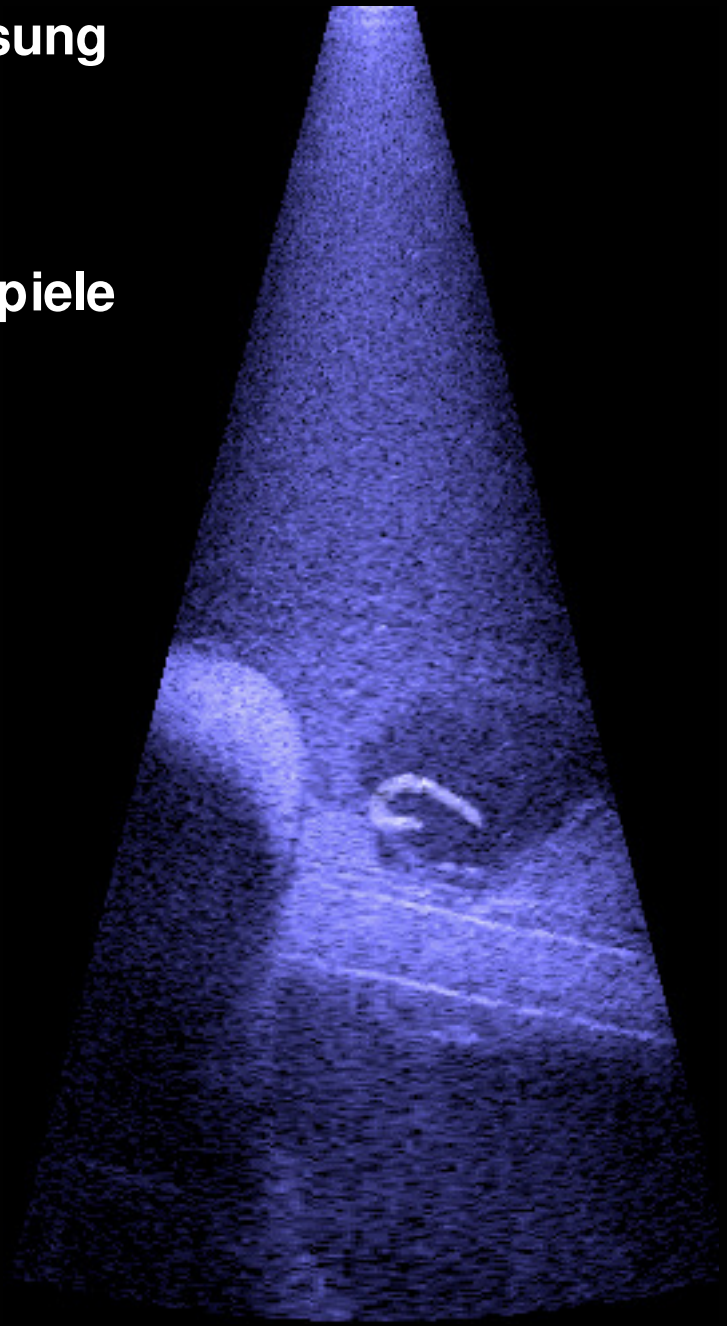
Hydroakustische Methoden zur Fischerfassung unter besonderer Berücksichtigung einer akustischen Kamera (DIDSON) –

Anwendungsmöglichkeiten und Praxisbeispiele

AFGN-Tagung 18.09.2010

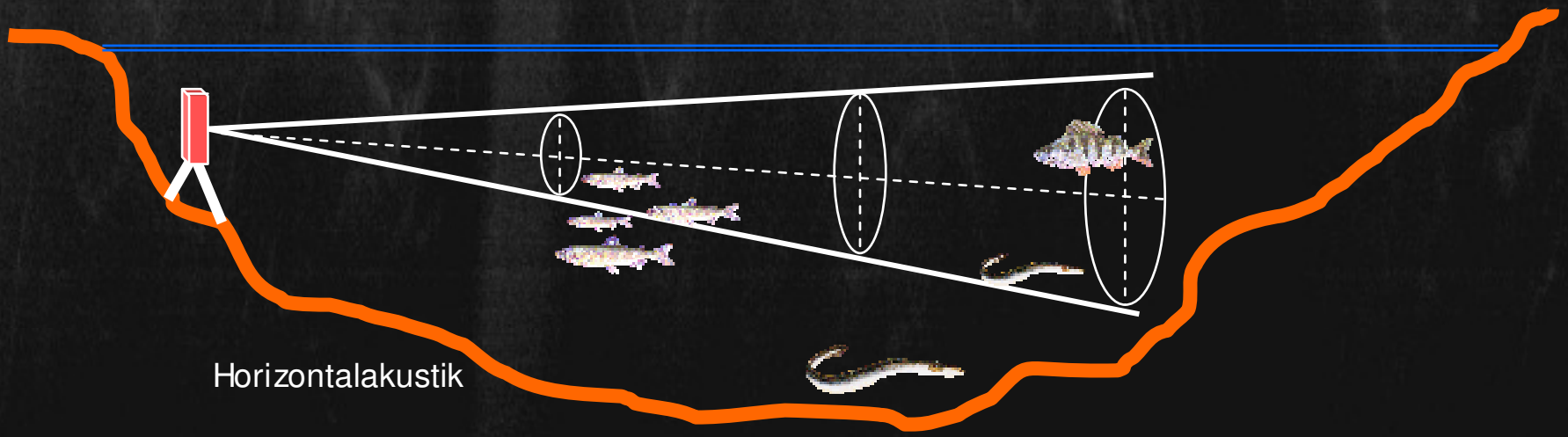


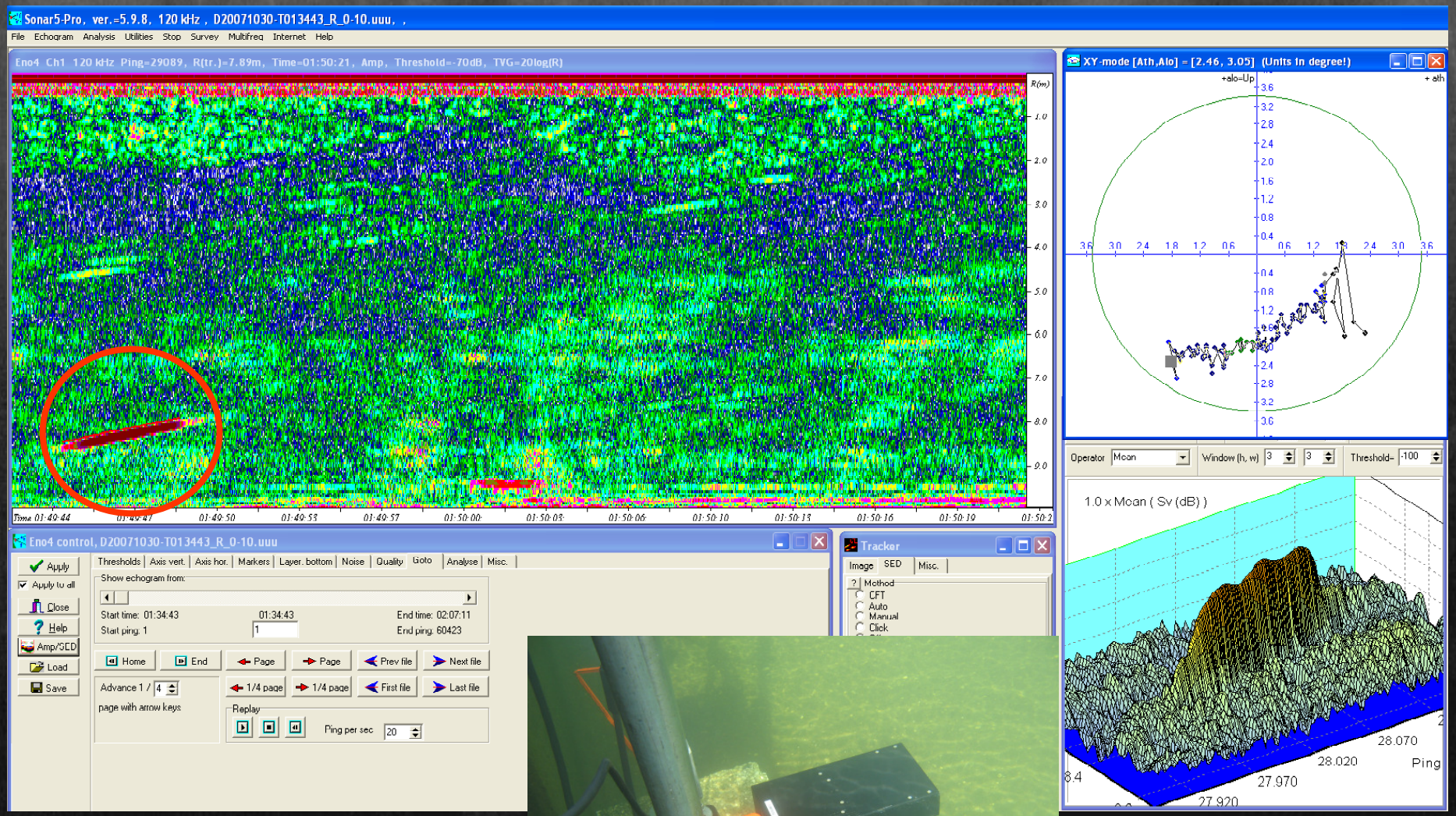
Dr. Marc Schmidt

Landesfischereiverband
Westfalen und Lippe e. V.

1. Grundsätzliches
2. Warum?
3. „Theorie“
4. Praxisbeispiele
5. Post-Processing
6. Perspektiven
7. Kosten und Praxistauglichkeit

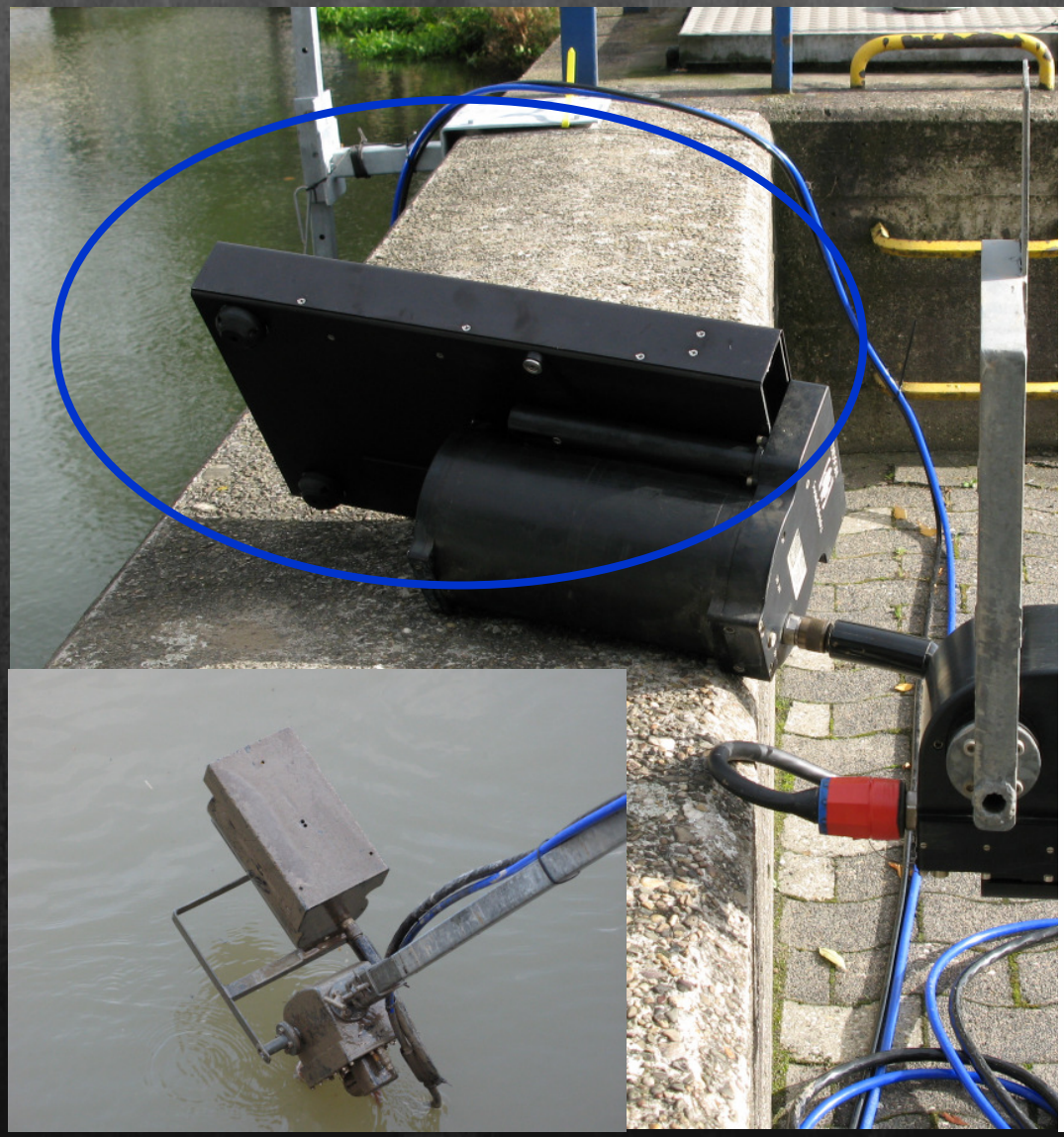
Tana (NO), Dr. Helge Balk, Uni Oslo





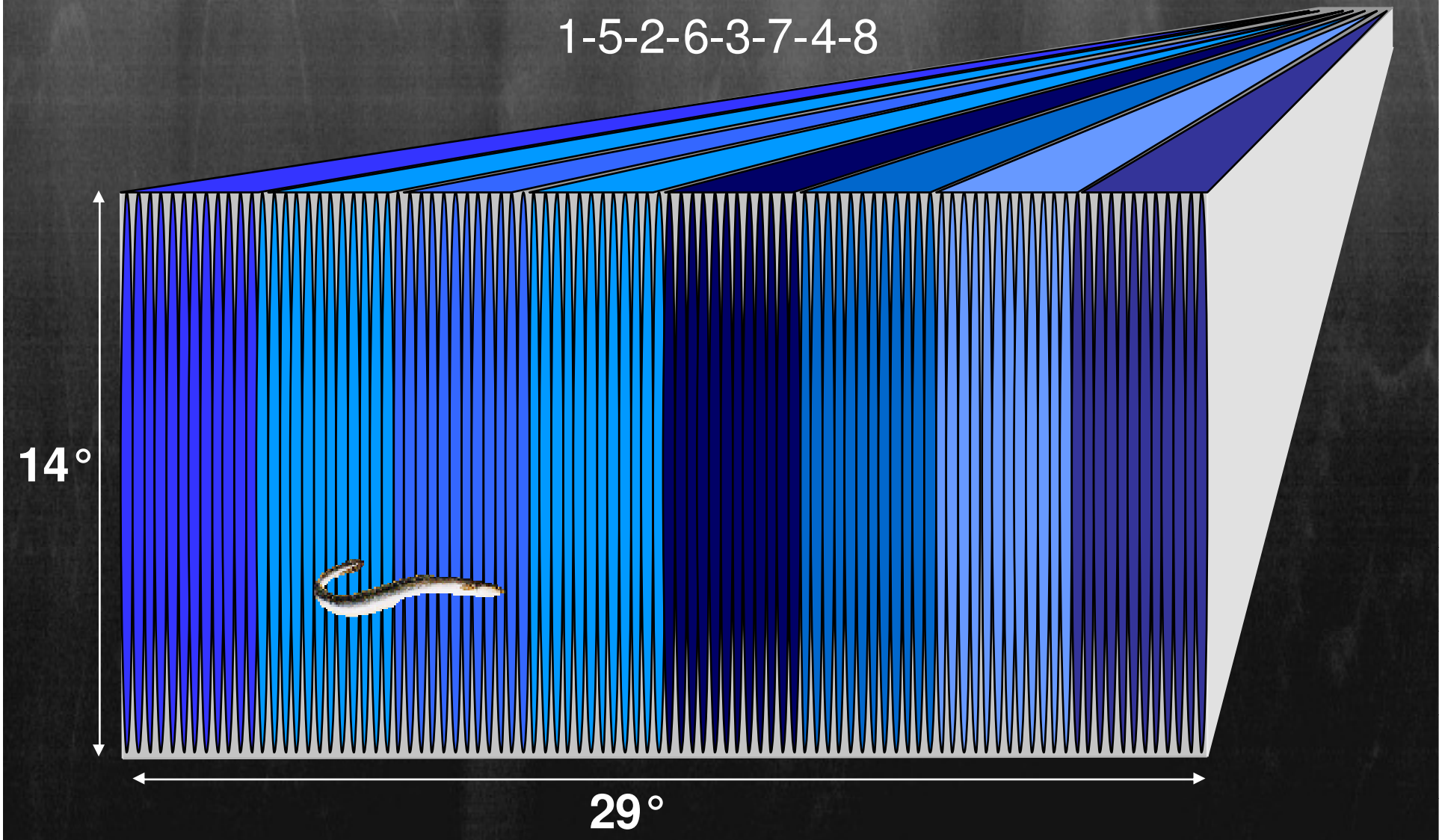
→ SPLIT-BEAM vs. DIDSON

Warum?



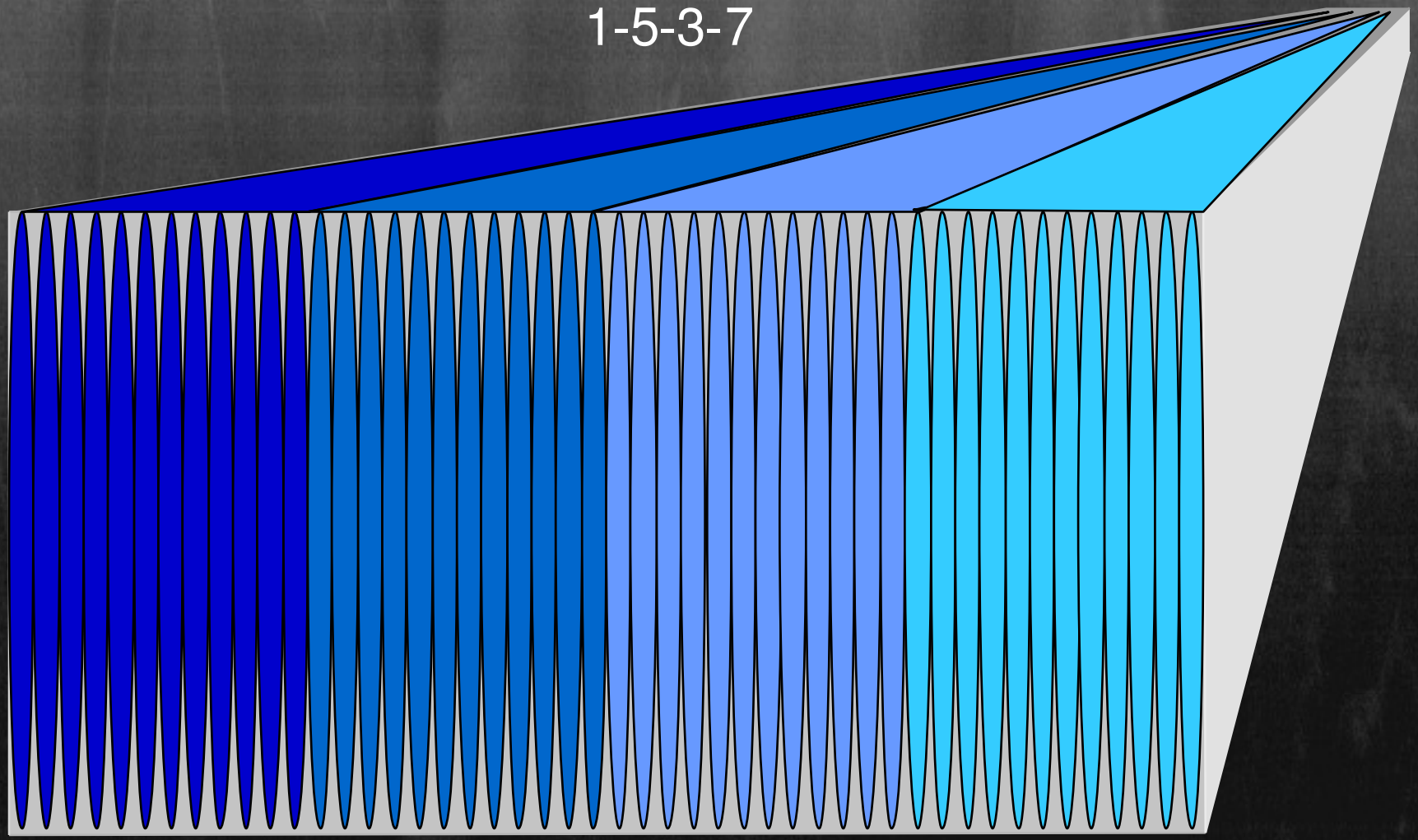
Unabhängig von Lichtverhältnissen und Wassertrübung

„Theorie“

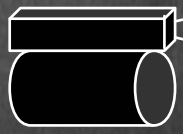


High Frequency (HF): 96 Beams (0.3°)
Keine 3. Dimension!

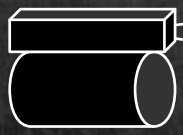
1-5-3-7



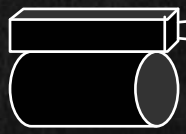
Low Frequency (LF): 48 Beams (0.6°)



Standard DIDSON HF (15 m)

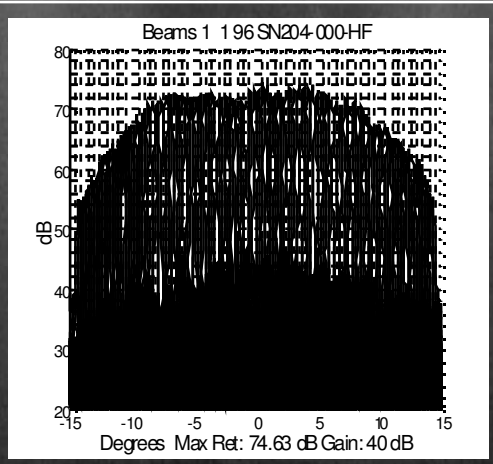


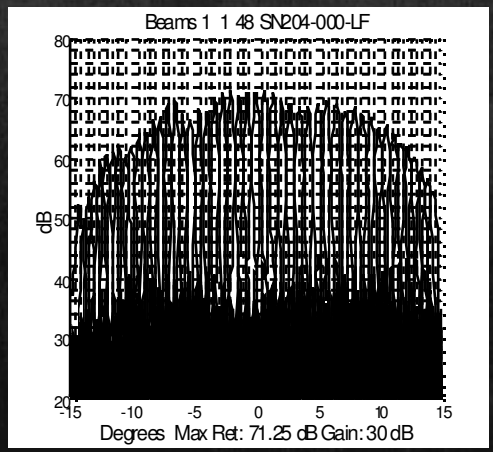
Standard DIDSON LF (30 m)

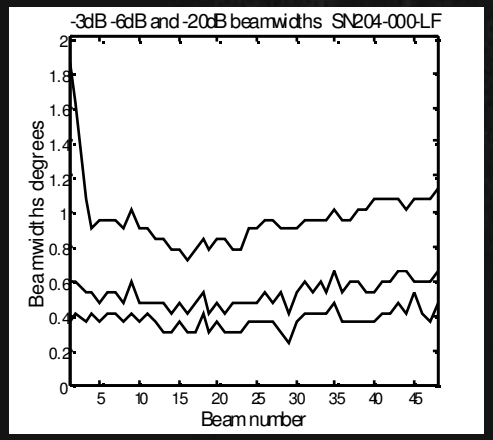


Long Range DIDSON LF (60 m)

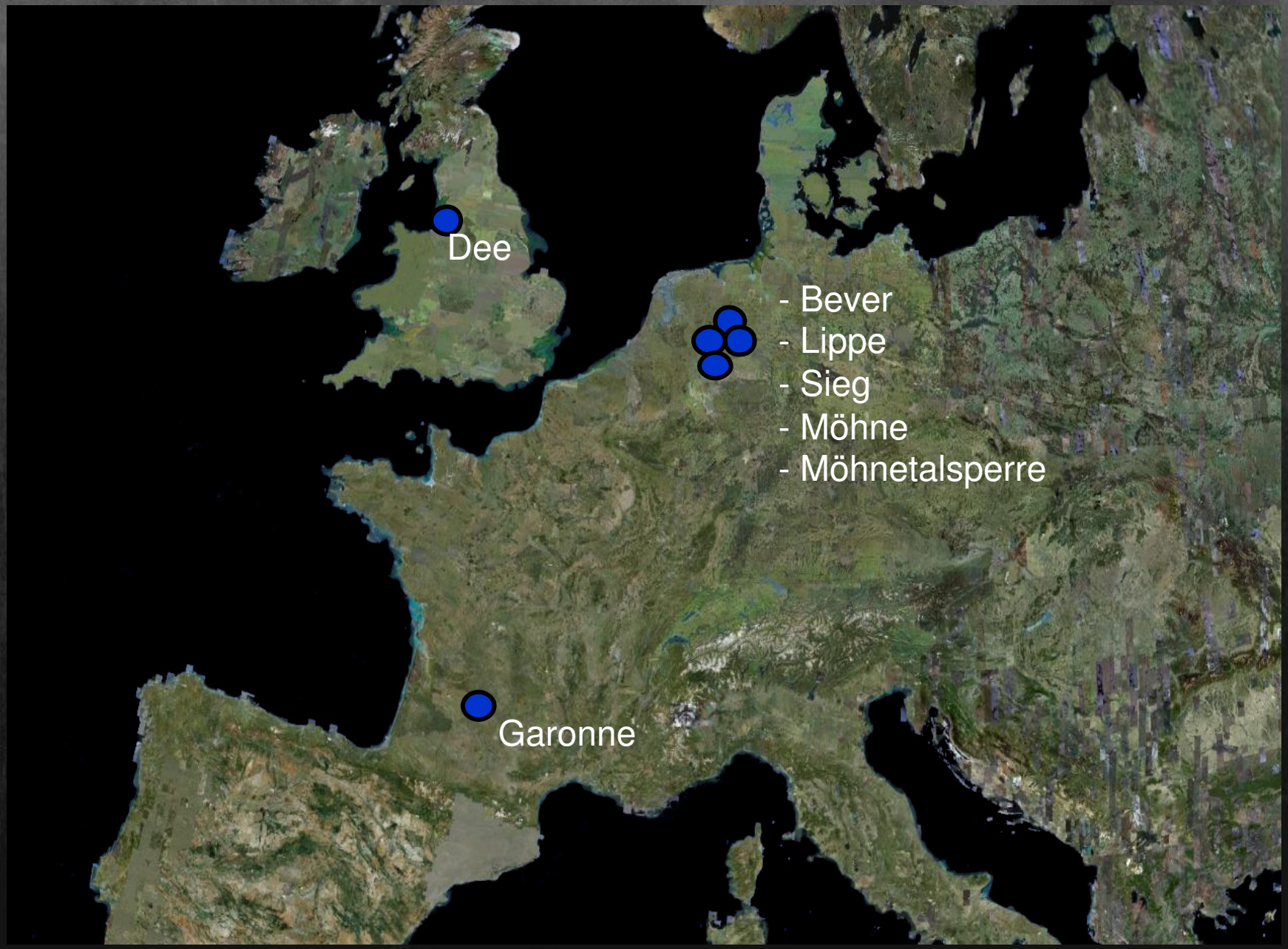
→ „Reichweiten“

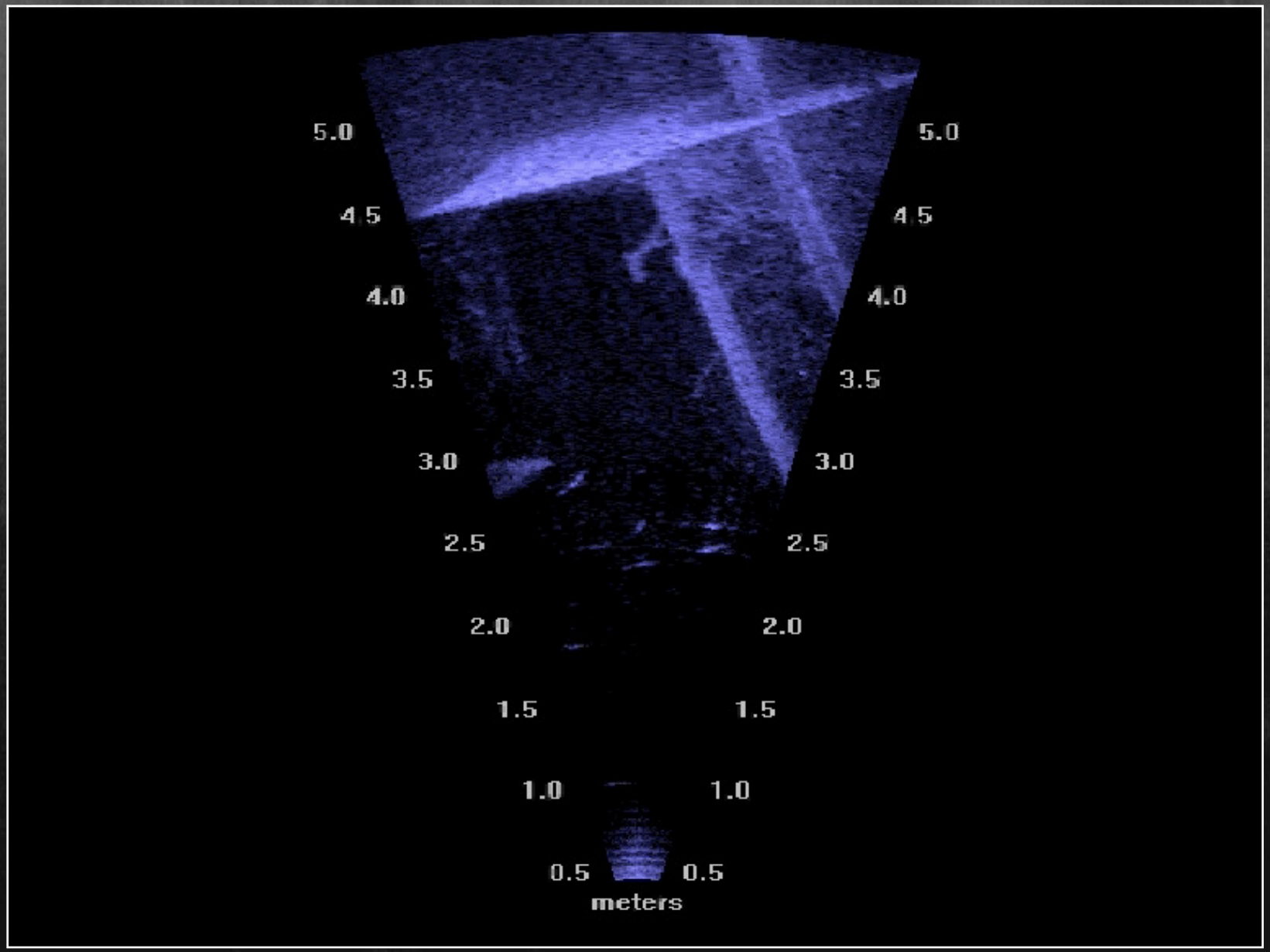






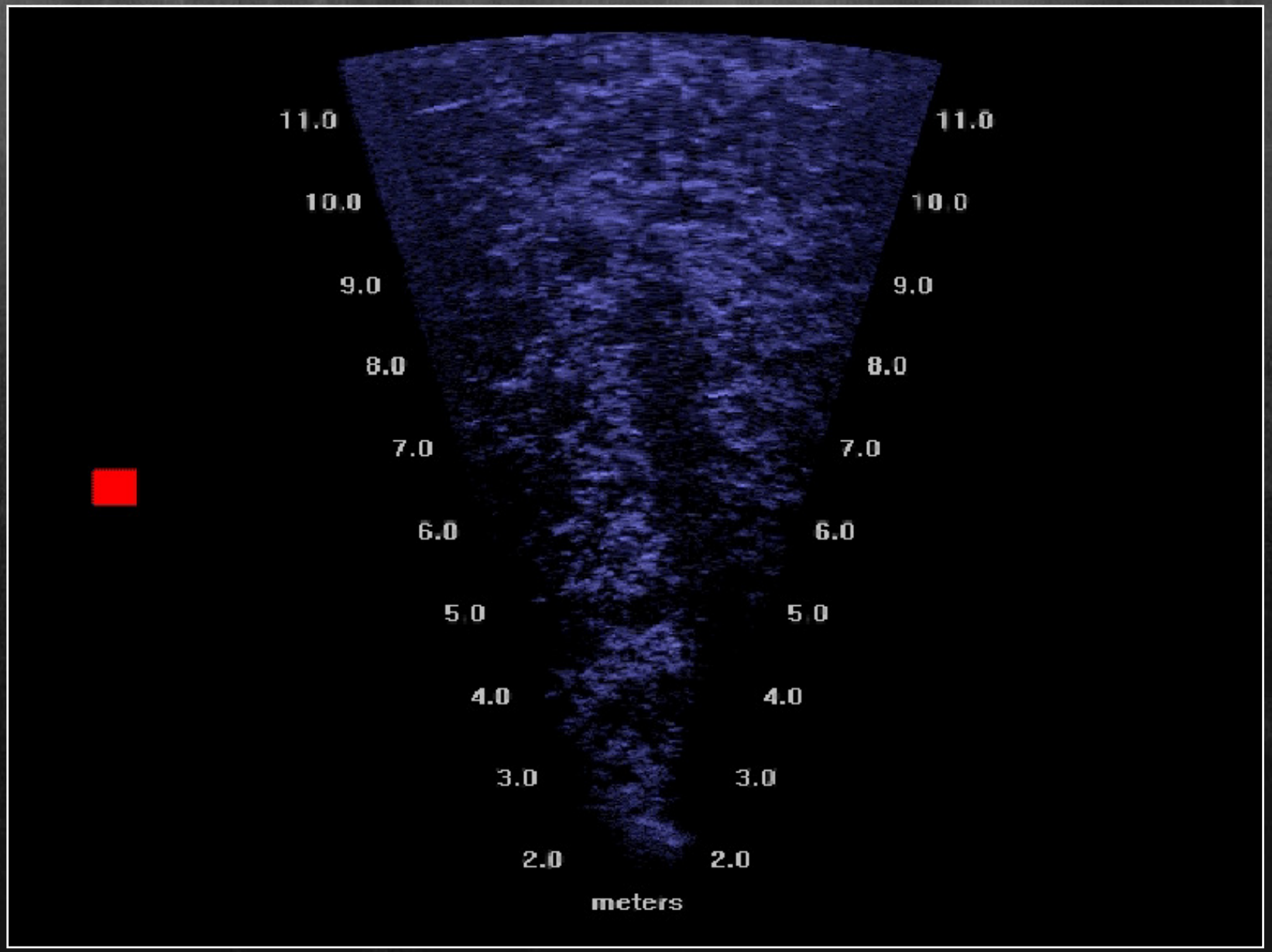
Praxisbeispiele


Dee
- Bever
- Lippe
- Sieg
- Möhne
- Möhnetalsperre
Garonne



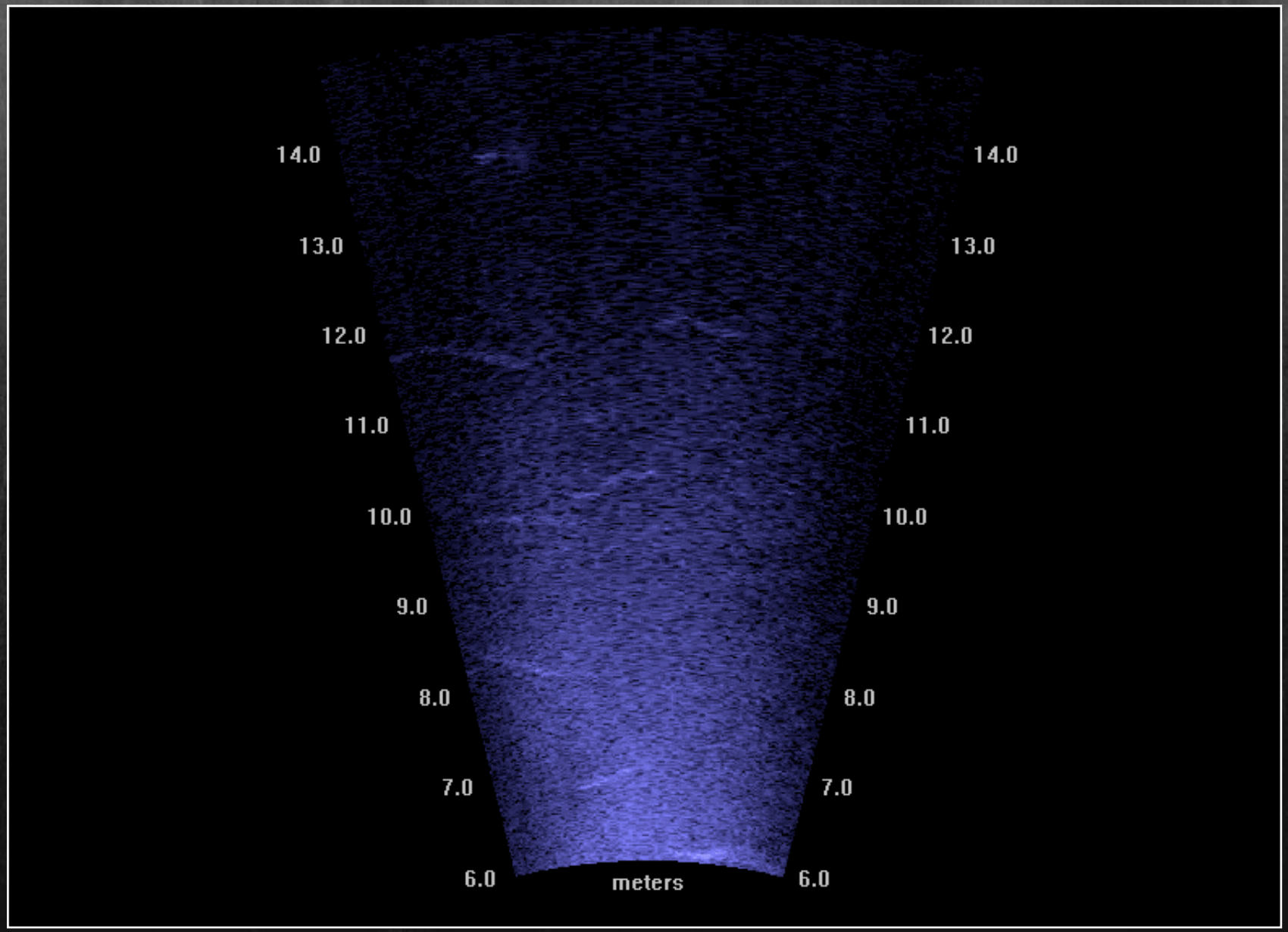
Wasserentnahmebauwerk (River Dee, GB)

Jon Hateley, Environment Agency, UK

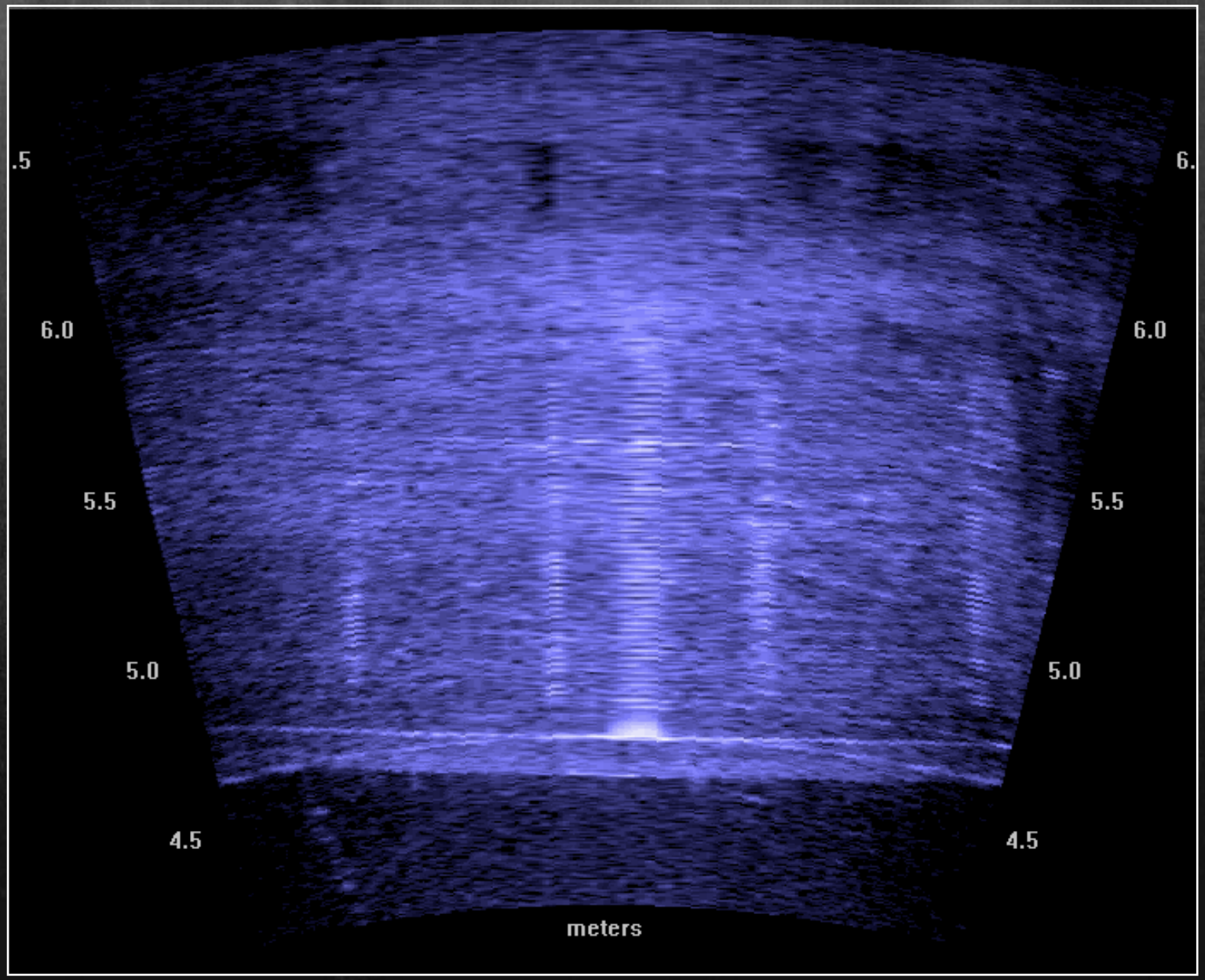


Meerforellen (Tees barrage, GB)

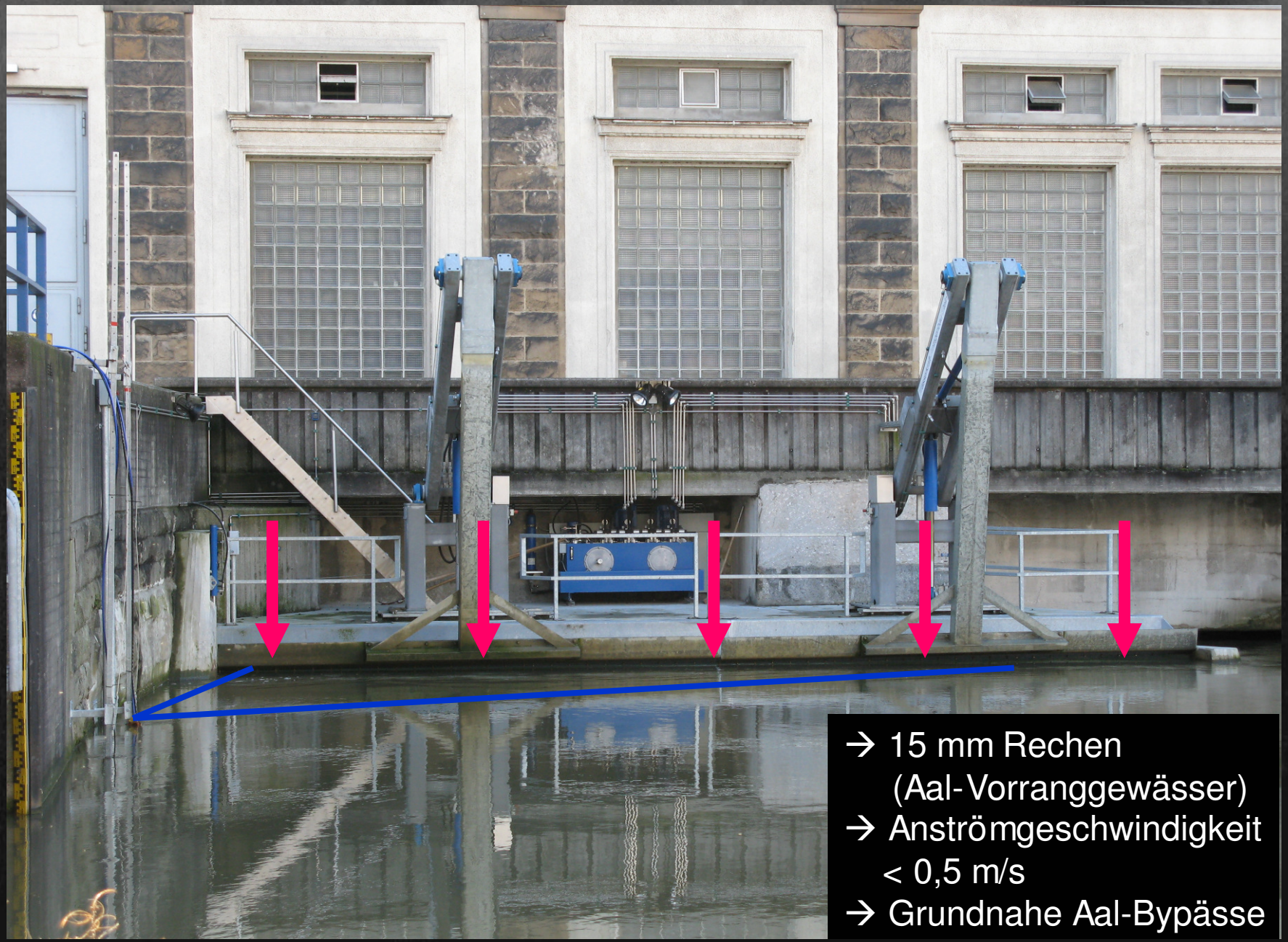
Jon Hateley, Environment Agency, UK

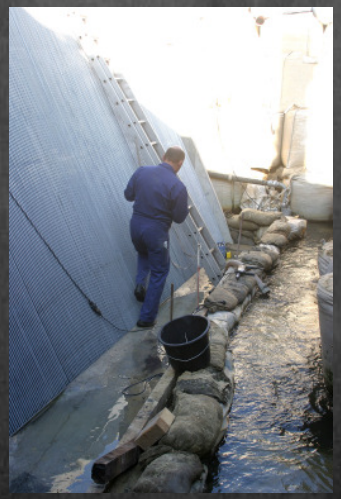


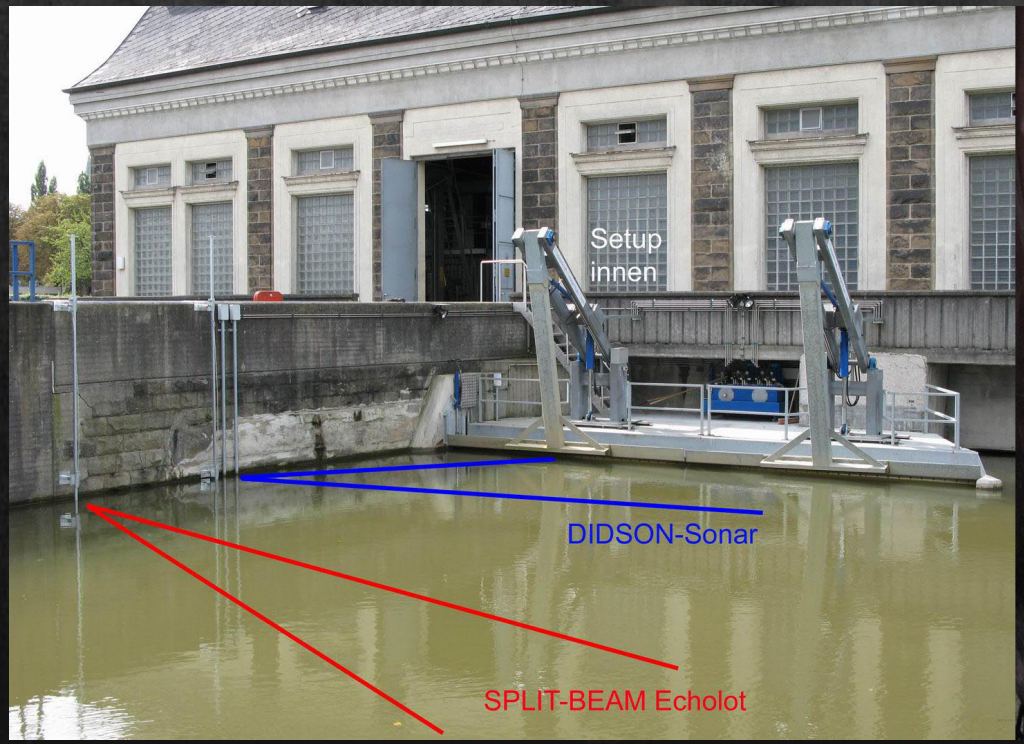
Welse (Fischlift Golfech, Garonne, F)



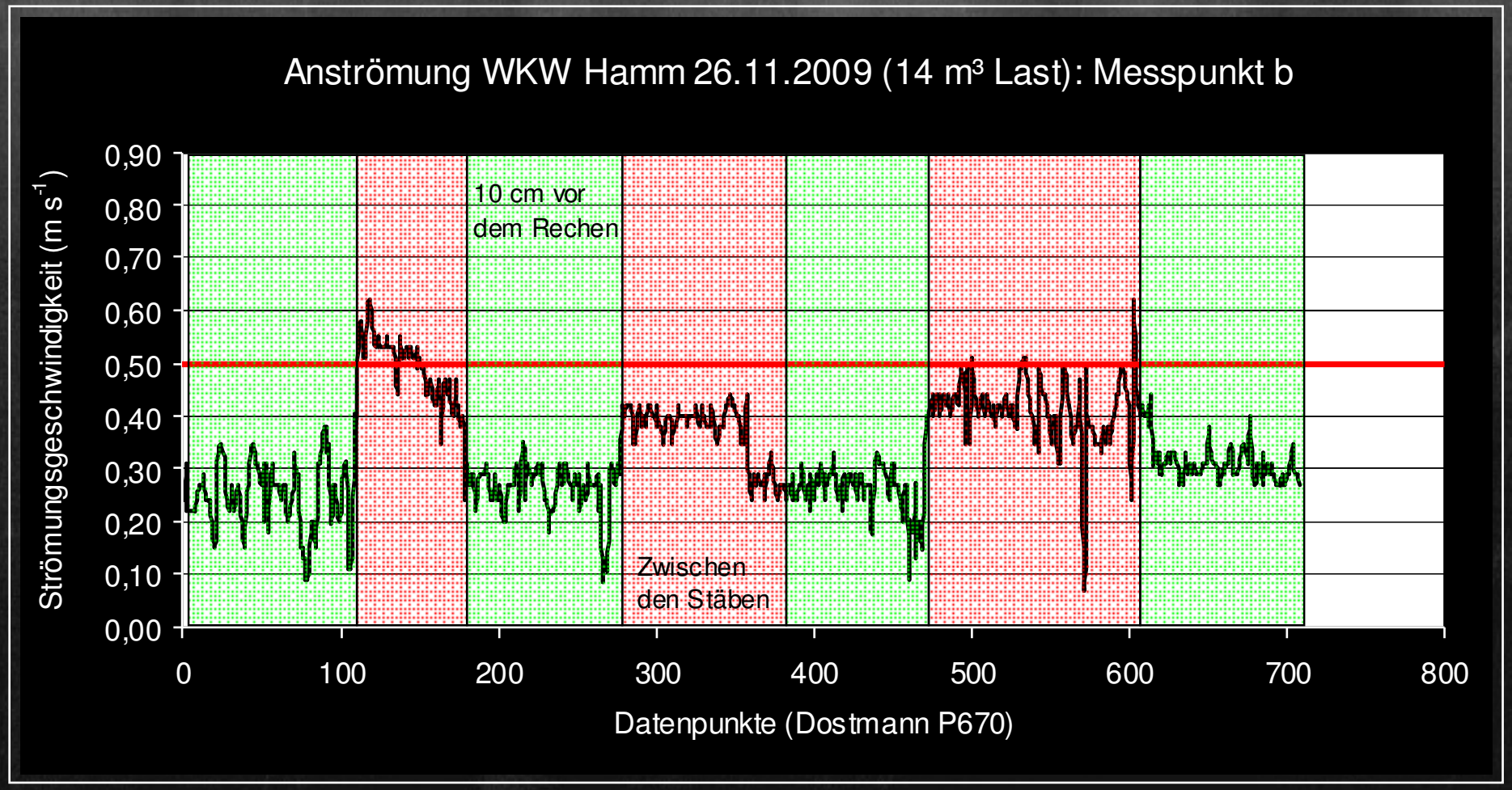
Blankaal am Rechen einer kleinen WKA (Bever, Münster)


→ 15 mm Rechen
(Aal-Vorranggewässer)
→ Anströmgeschwindigkeit
< 0,5 m/s
→ Grundnahe Aal-Bypässe

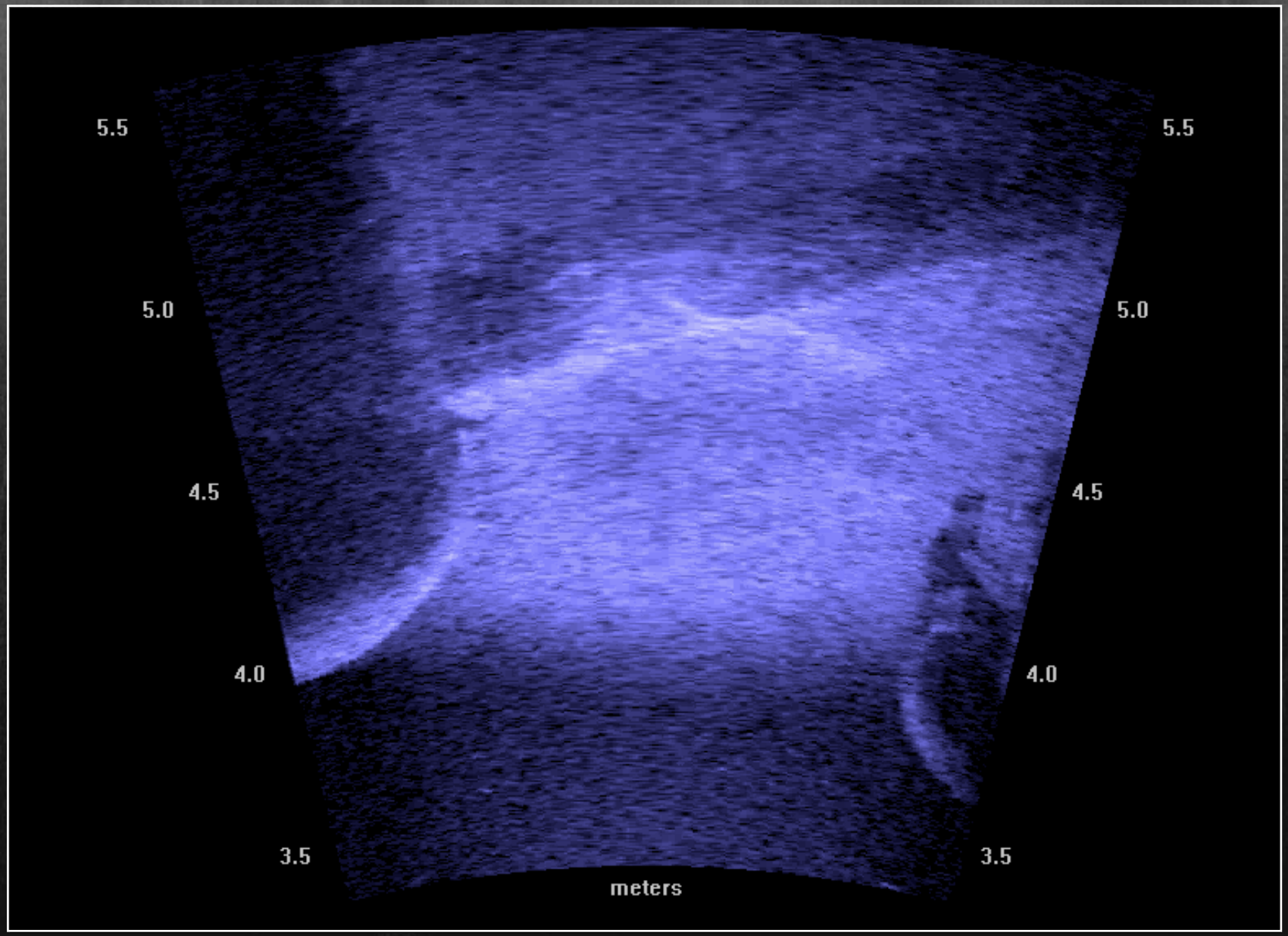




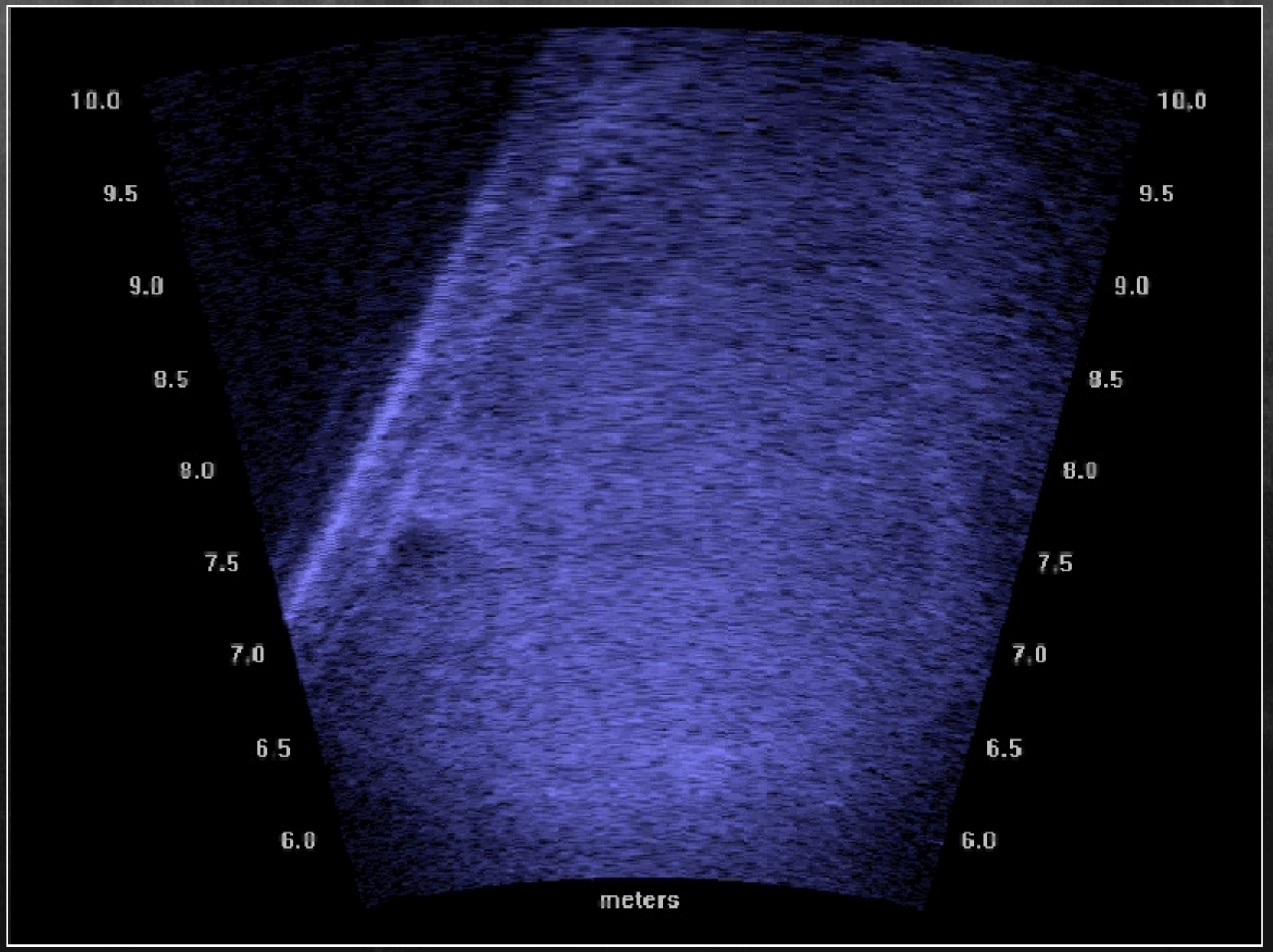
WKW Hamm: Bypässe und hydroakustisches Setup



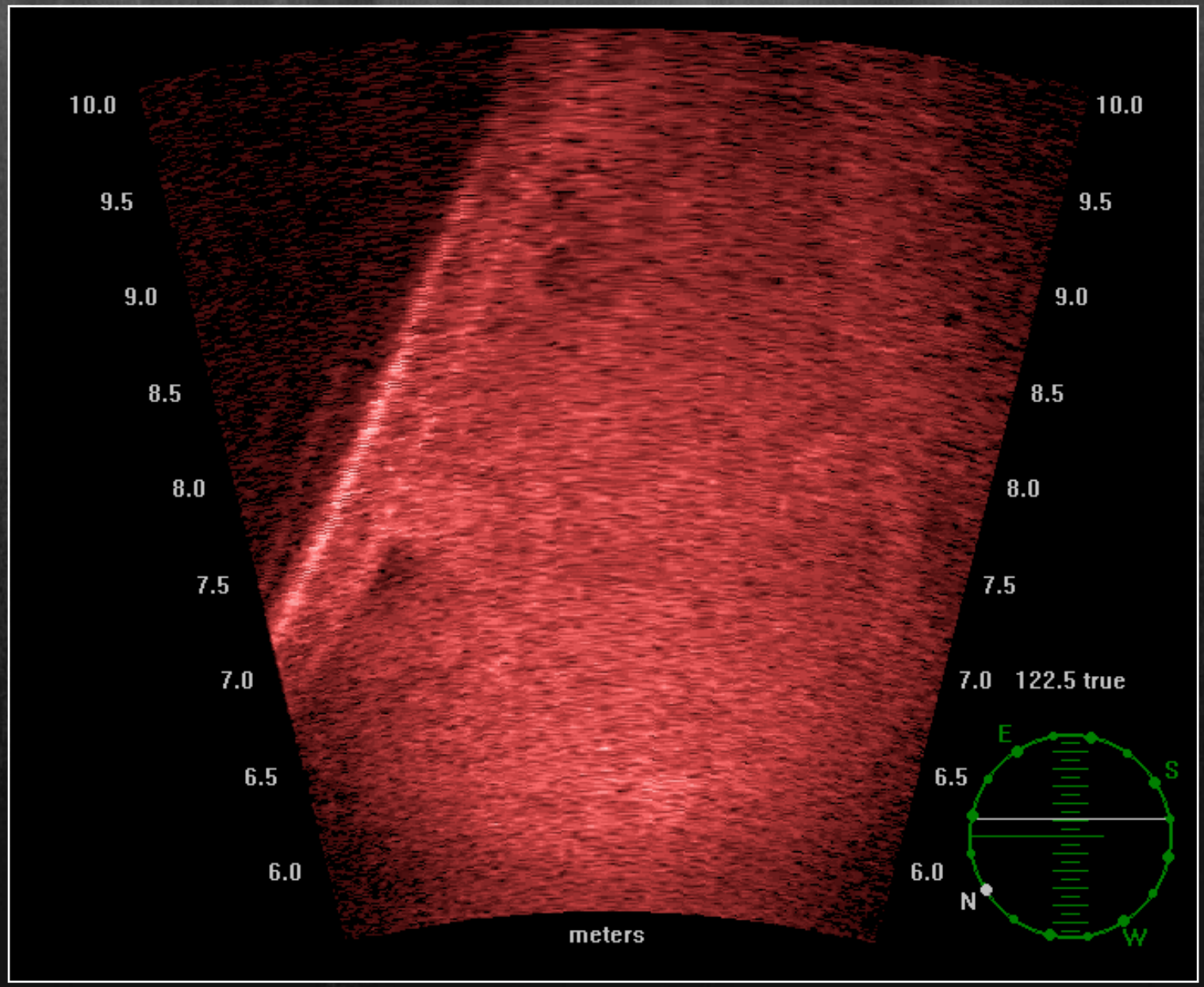
Anströmgeschwindigkeiten WKW Hamm



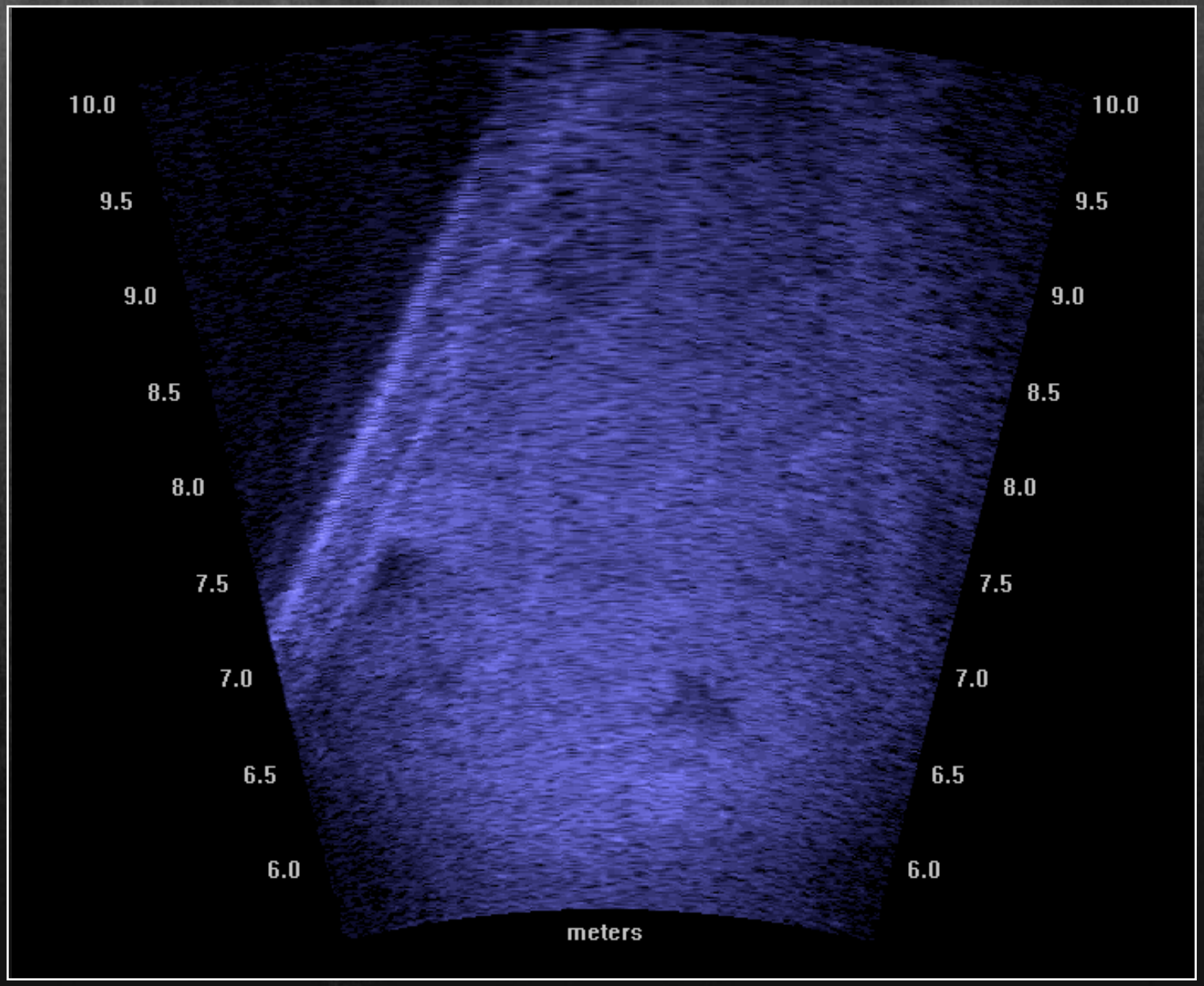
Zwei Karpfen an der Rechenbasis (WKW Hamm, Lippe)



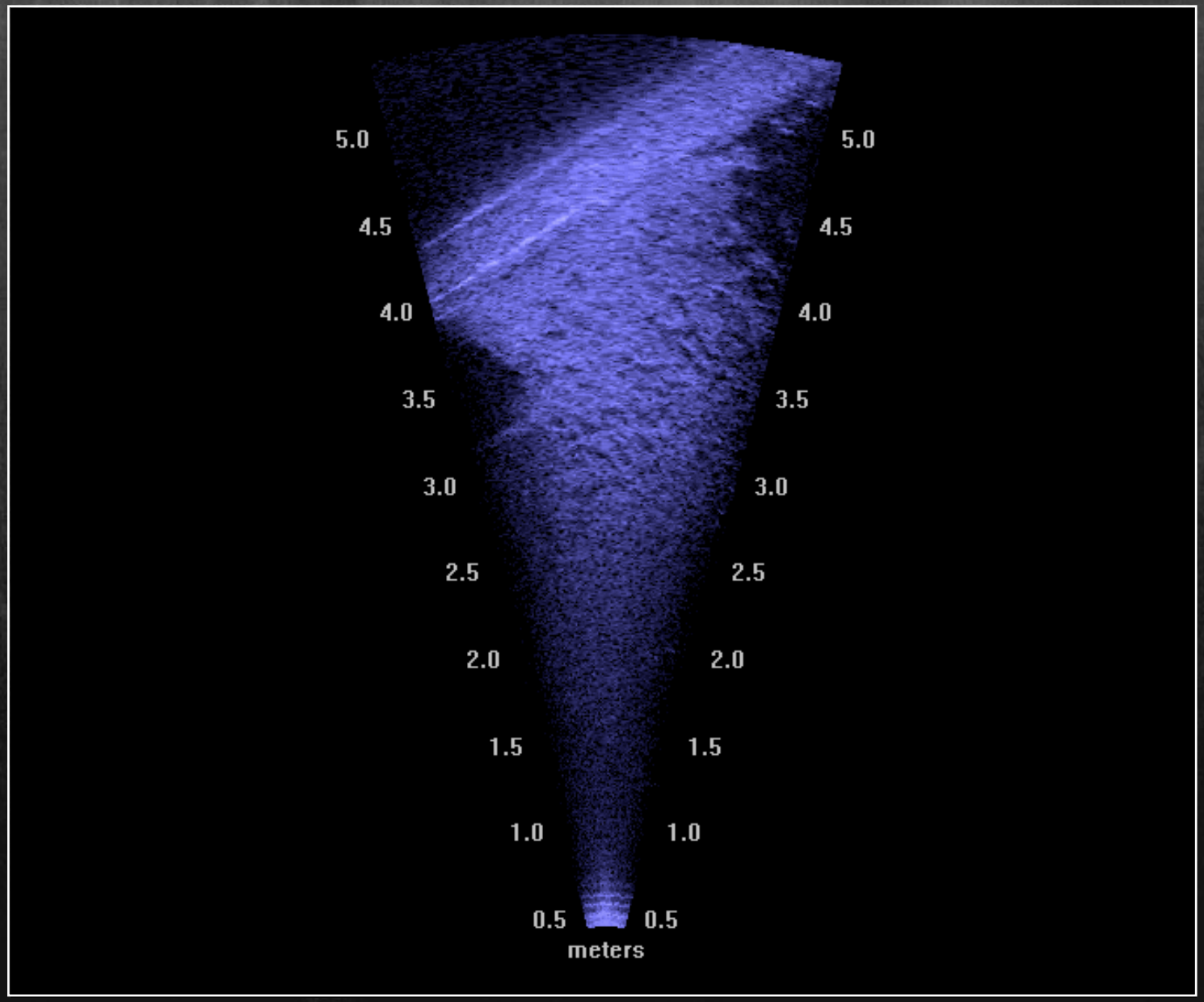
Wels (> 180 cm) am Rechen (WKW Hamm, Lippe)



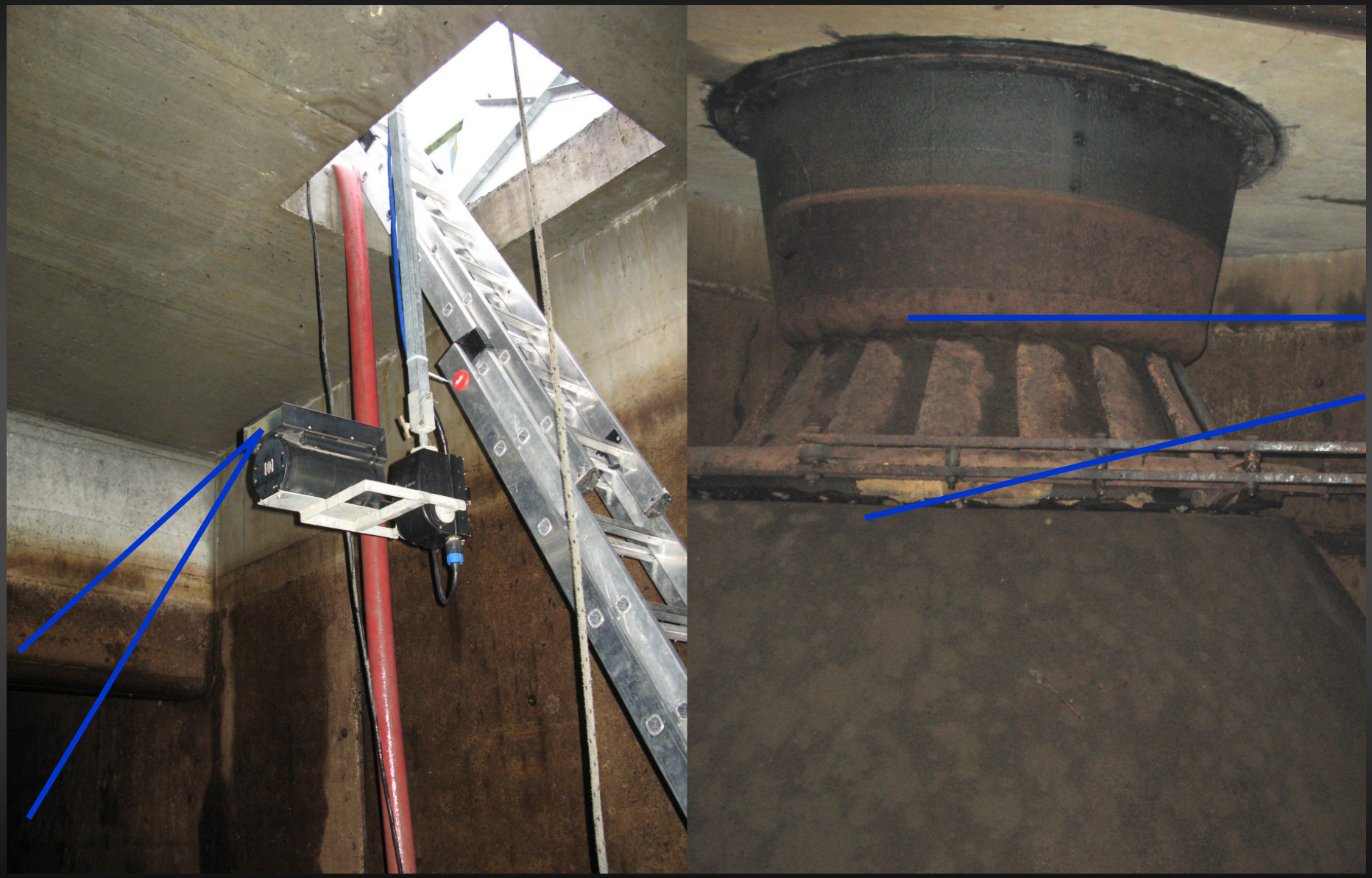
Reaktion: Auftreffen und Rückschwimmen (WKW Hamm, Lippe)

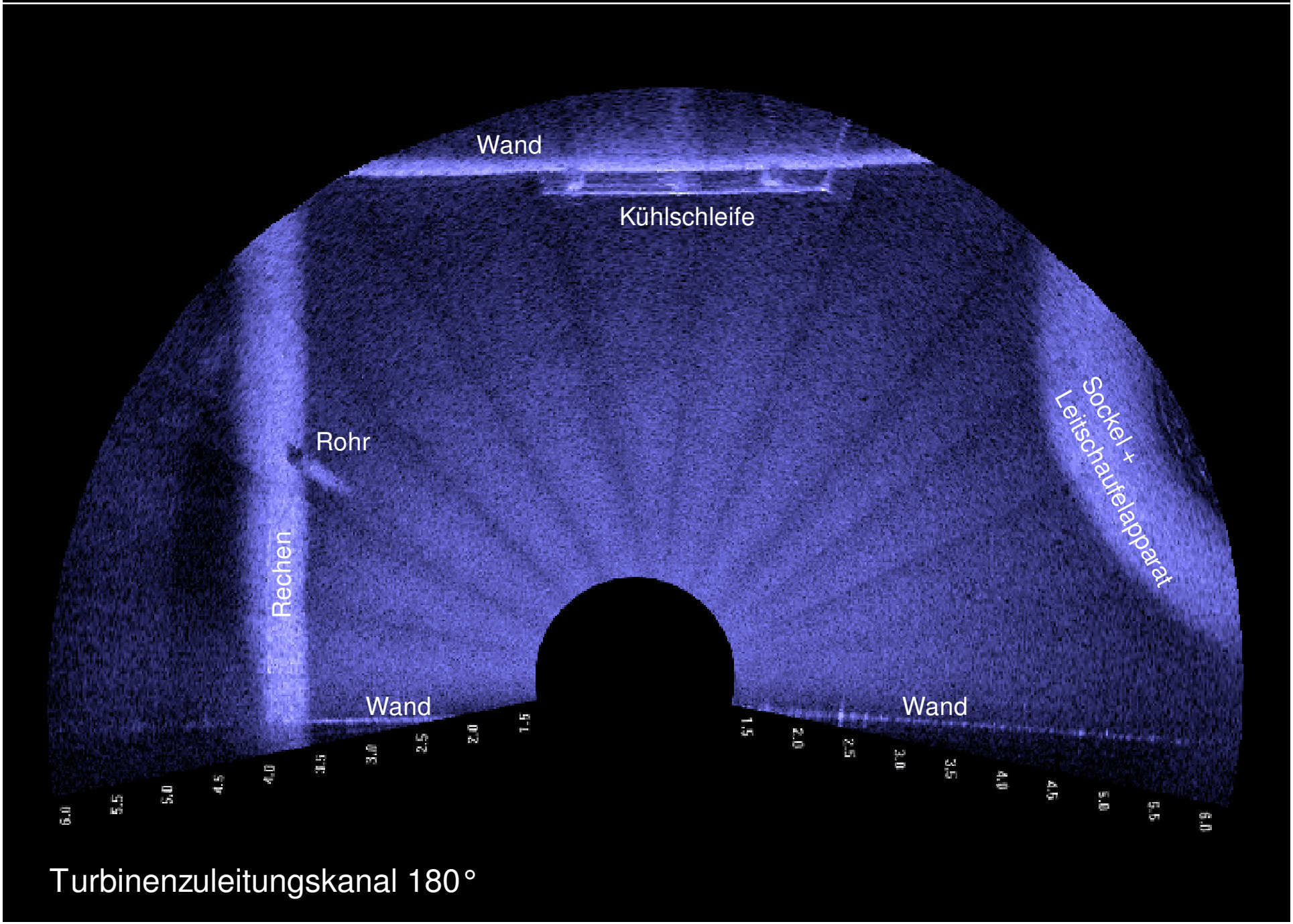


Aal und Rechenreiniger (WKW Hamm, Lippe)

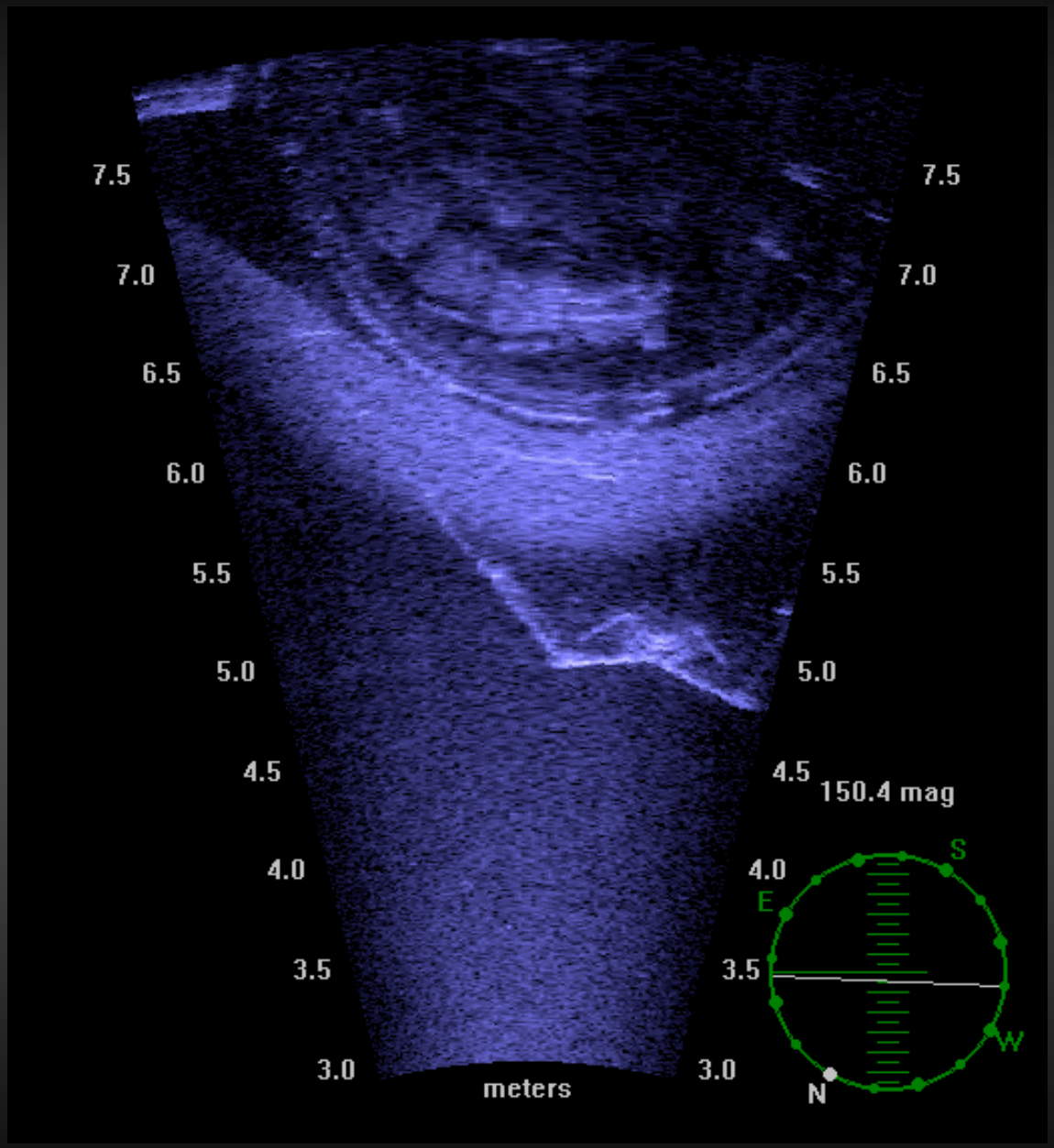


„Passives Einsaugen“ (WKW Hamm, Lippe)

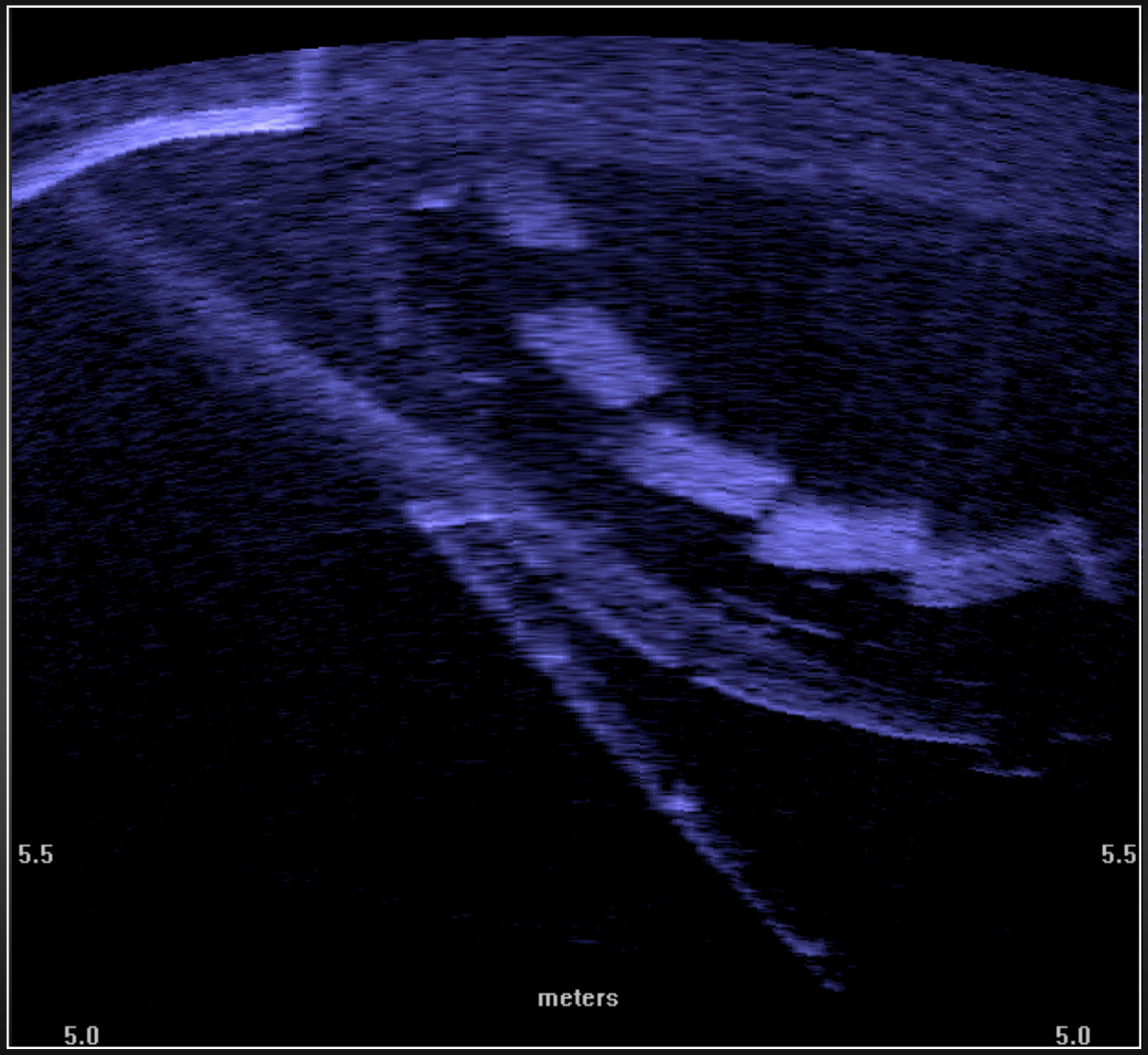




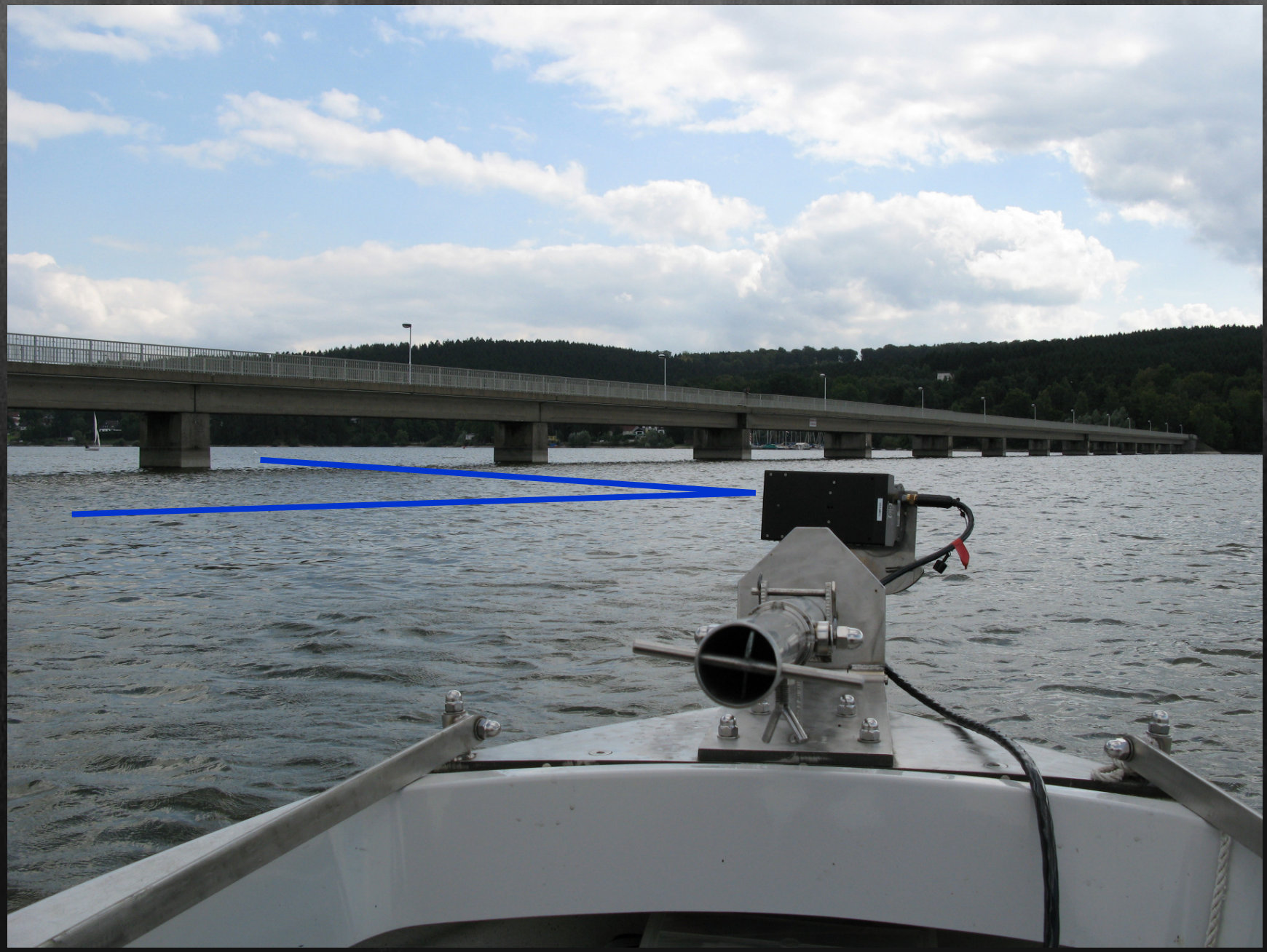
Turbinenzuleitungskanal 180°

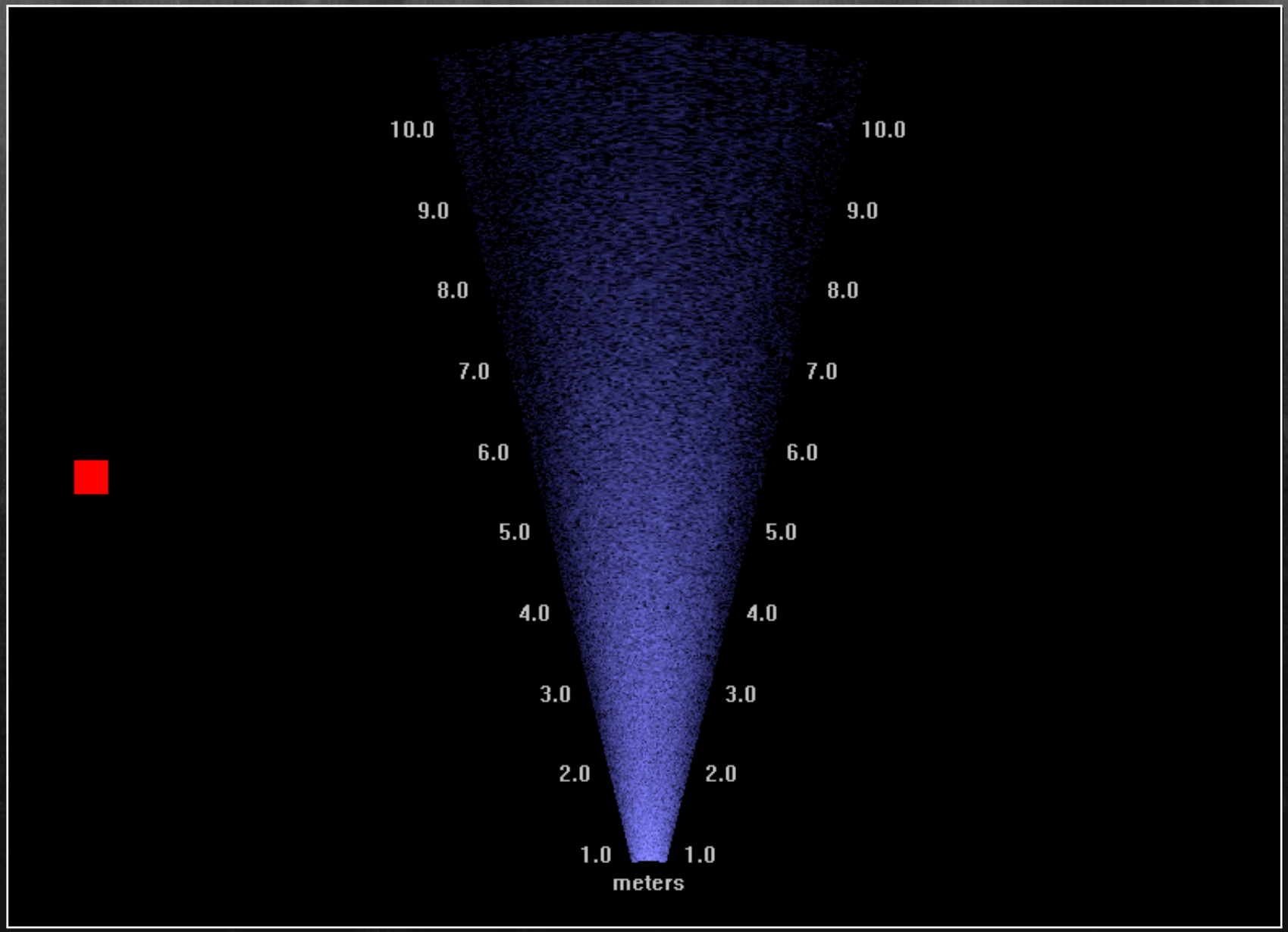


Leitschaufelapparat



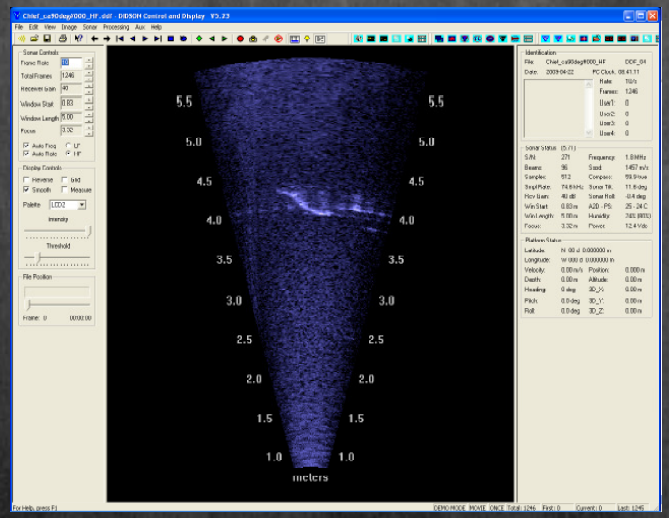
Bachforelle am Leitschaufelapparat einer WKA





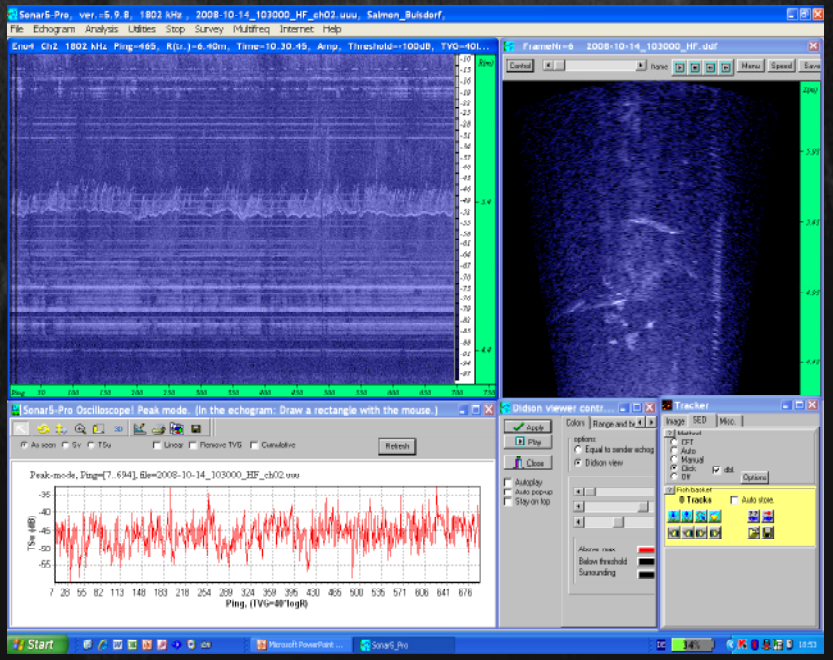
Fischansammlungen an Brückenpfeilern (Möhnetalsperre)

Datenauswertung/ Post-processing

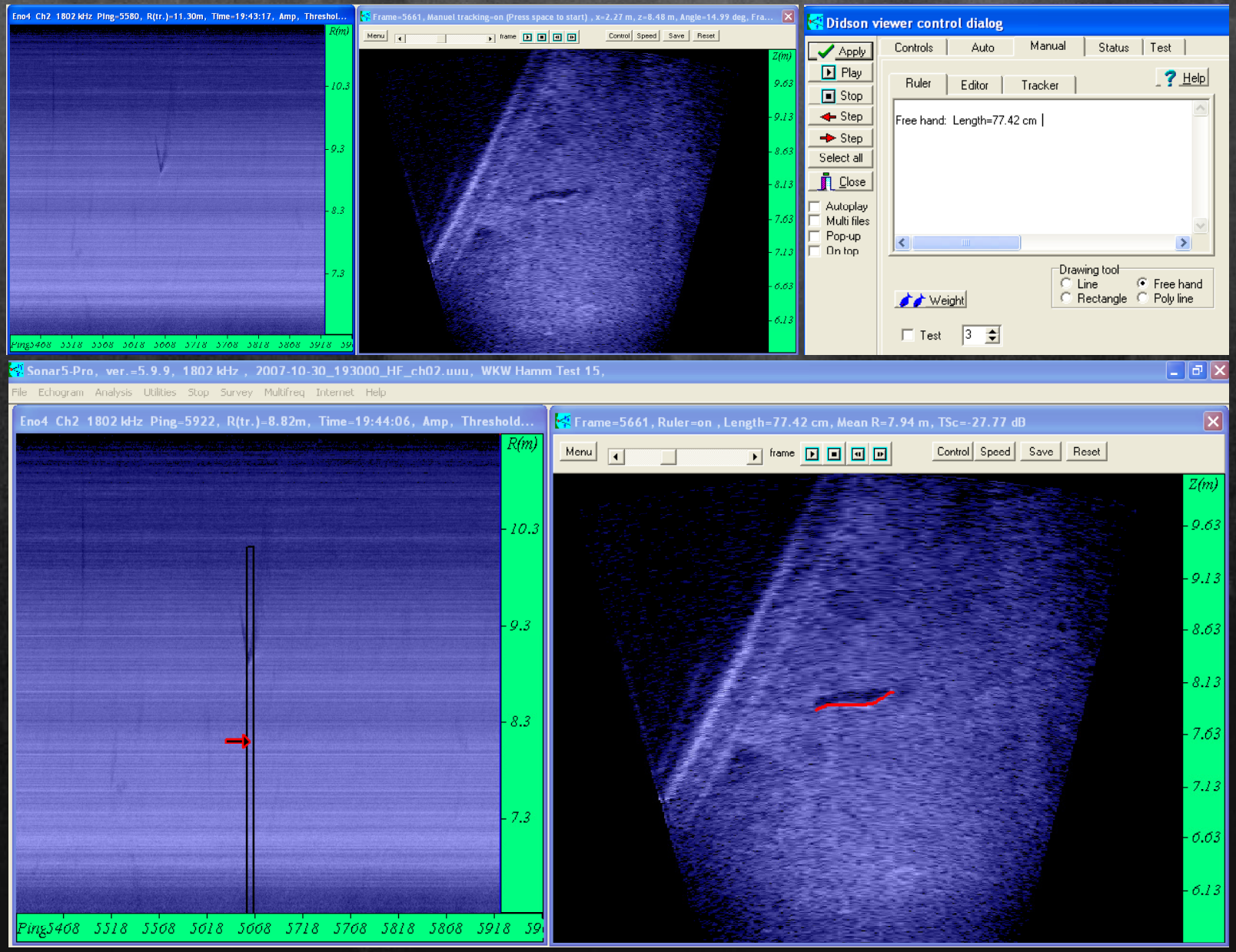


DIDSON Software (Soundmetrics, USA: Daten-erfassung/Auswertung begrenzt möglich, Lieferumfang)

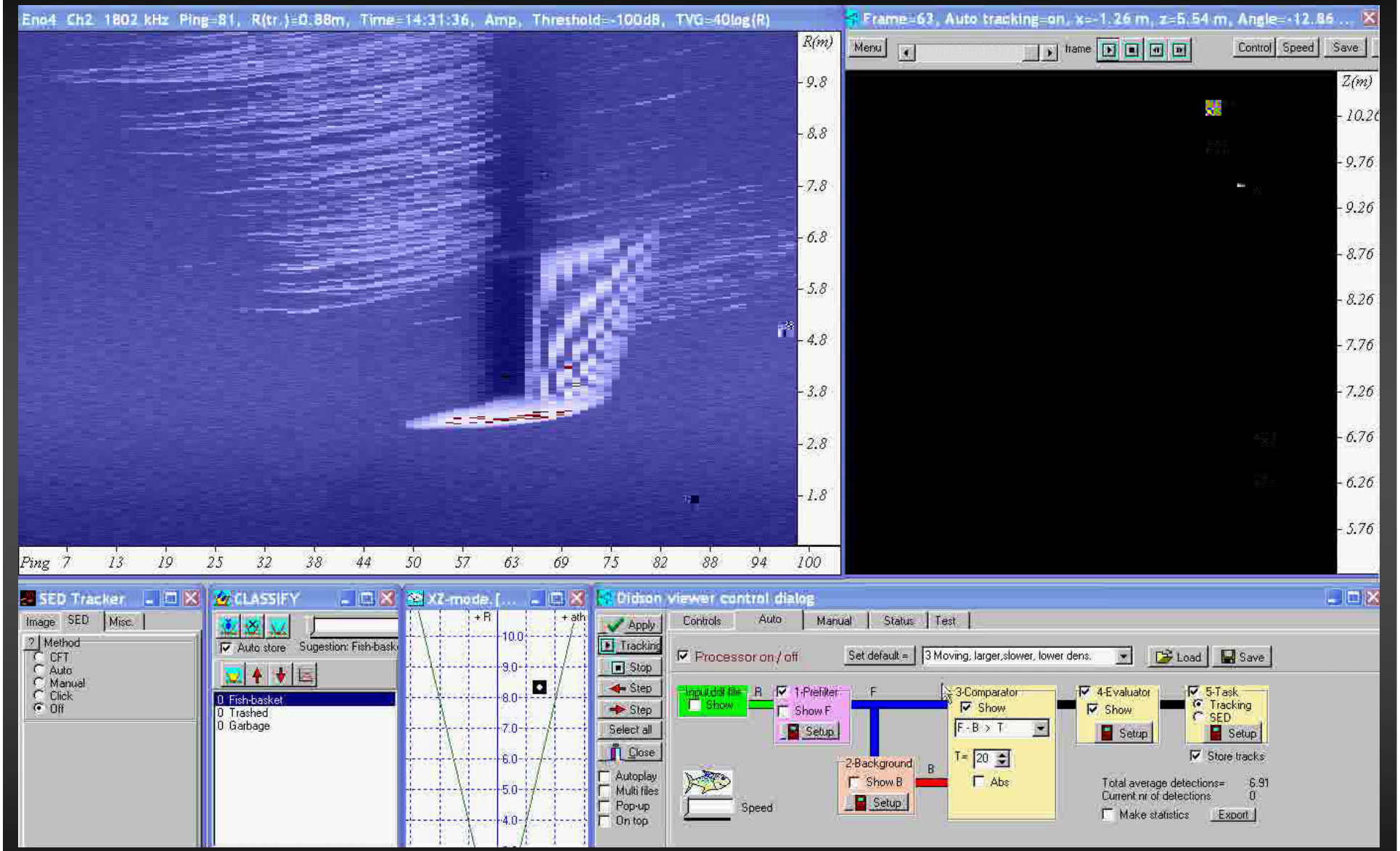
Echoview (Myriax, AUS, vormals SonarData)



Sonar5 Pro (Lindem Data Aquisition, NO)

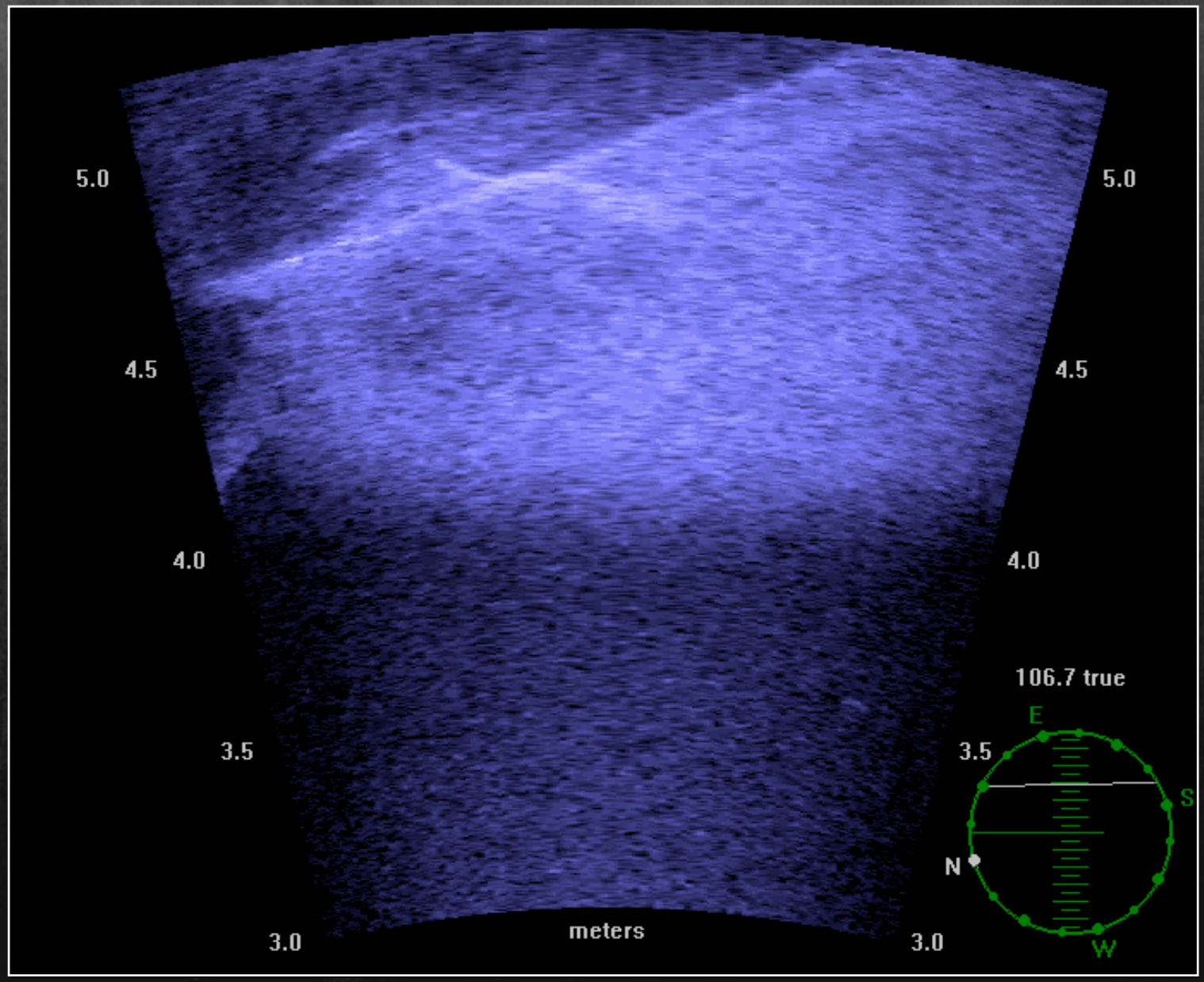


Zählen, Messen, **Verhaltensbeobachtung *in situ***

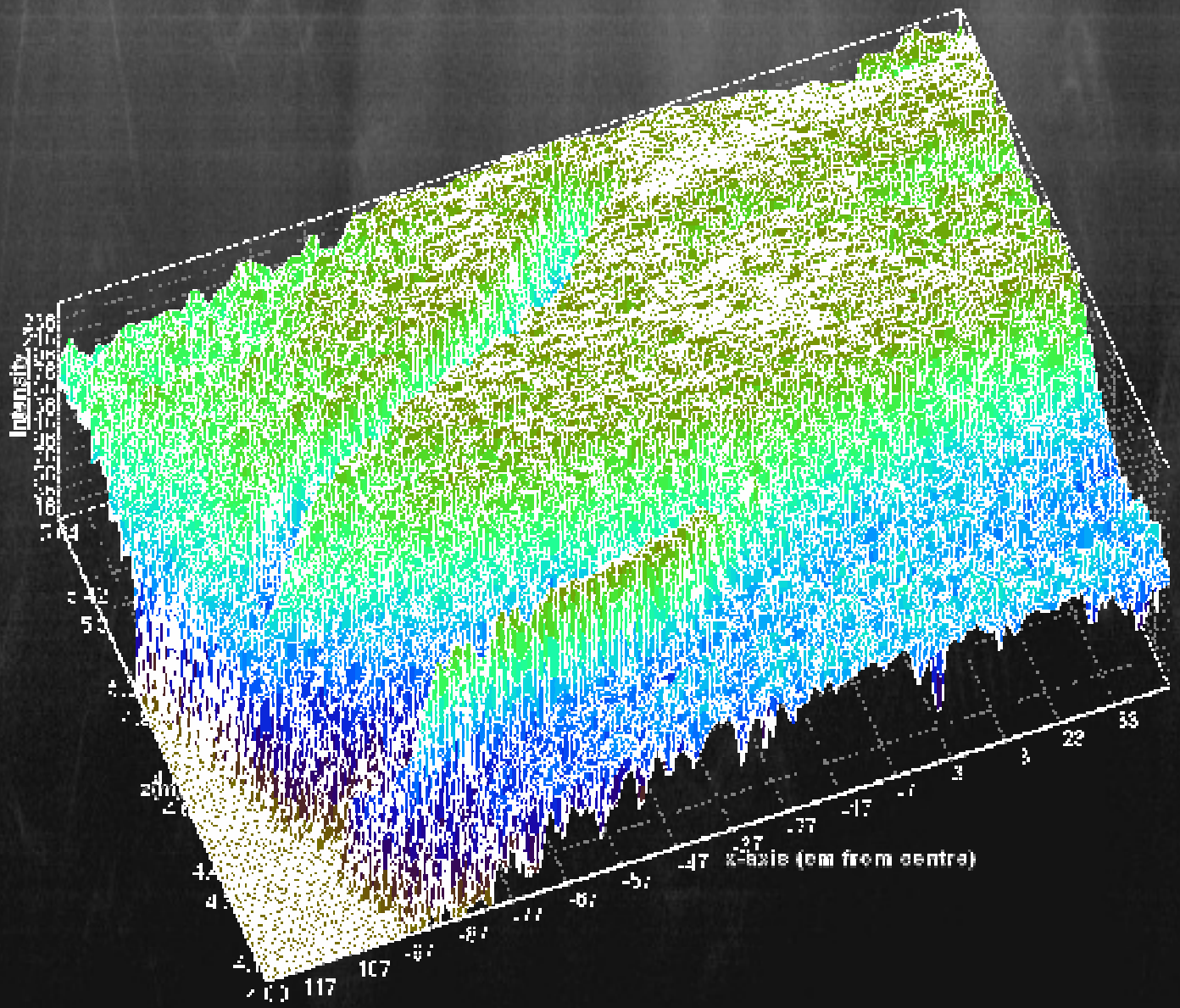


Automatisierte Erfassungssysteme

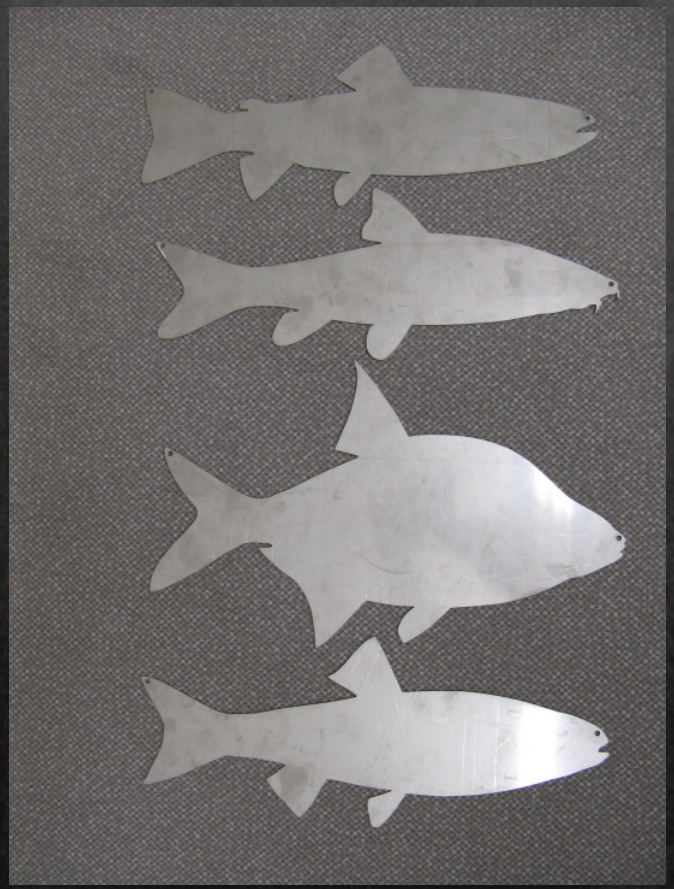
Perspektiven

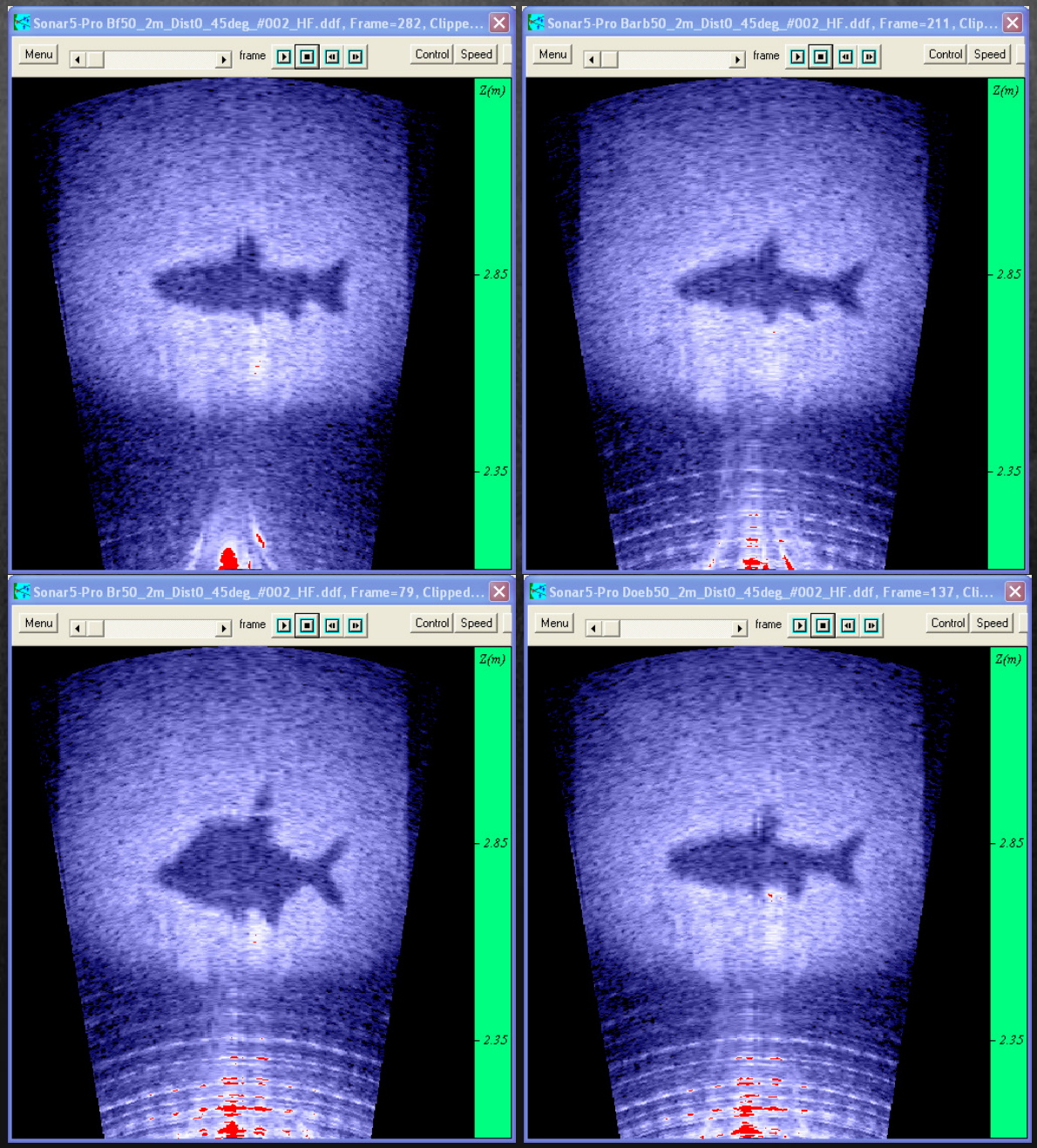


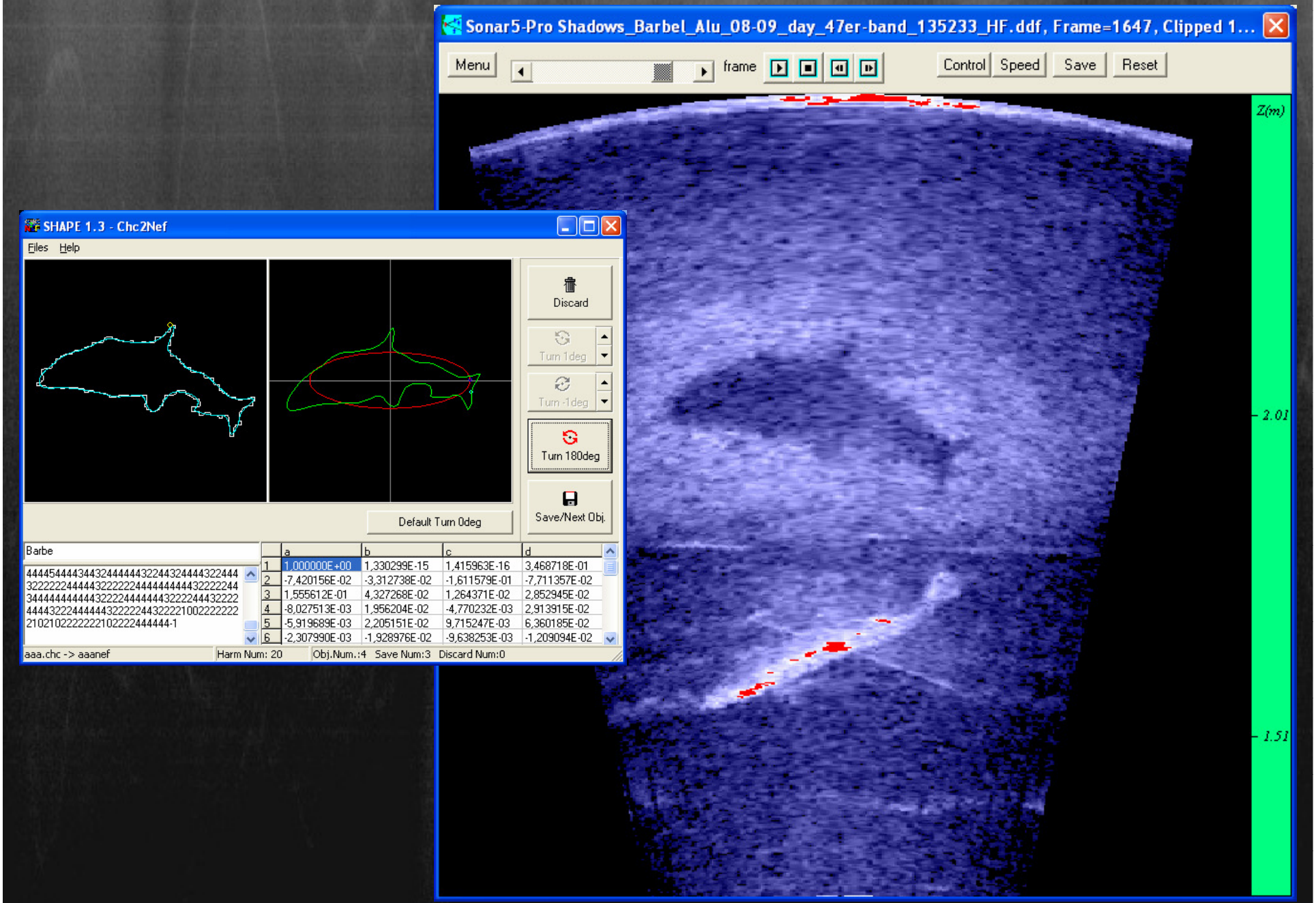
Aal und Echoschatten

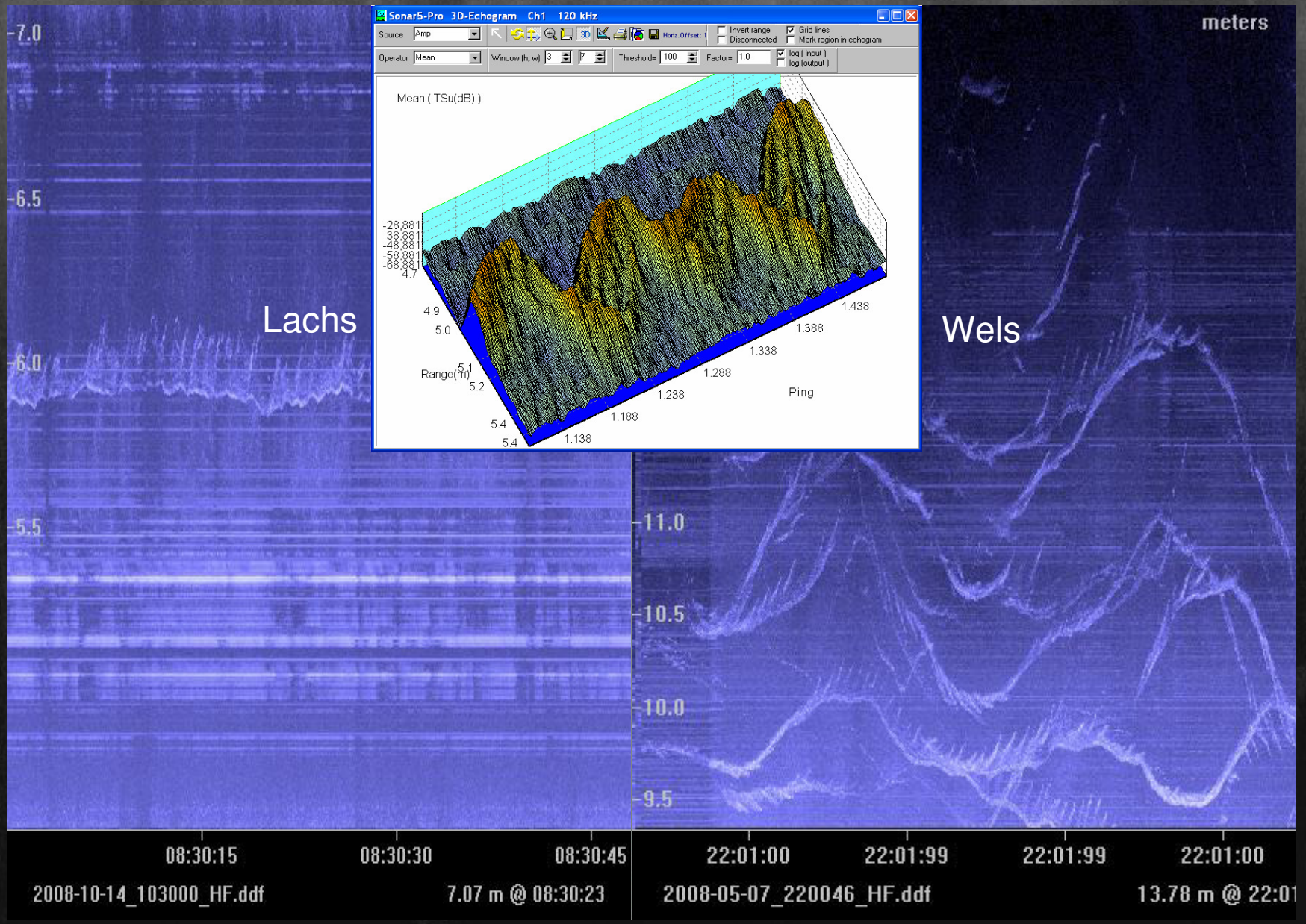


„Akustische Schatten“

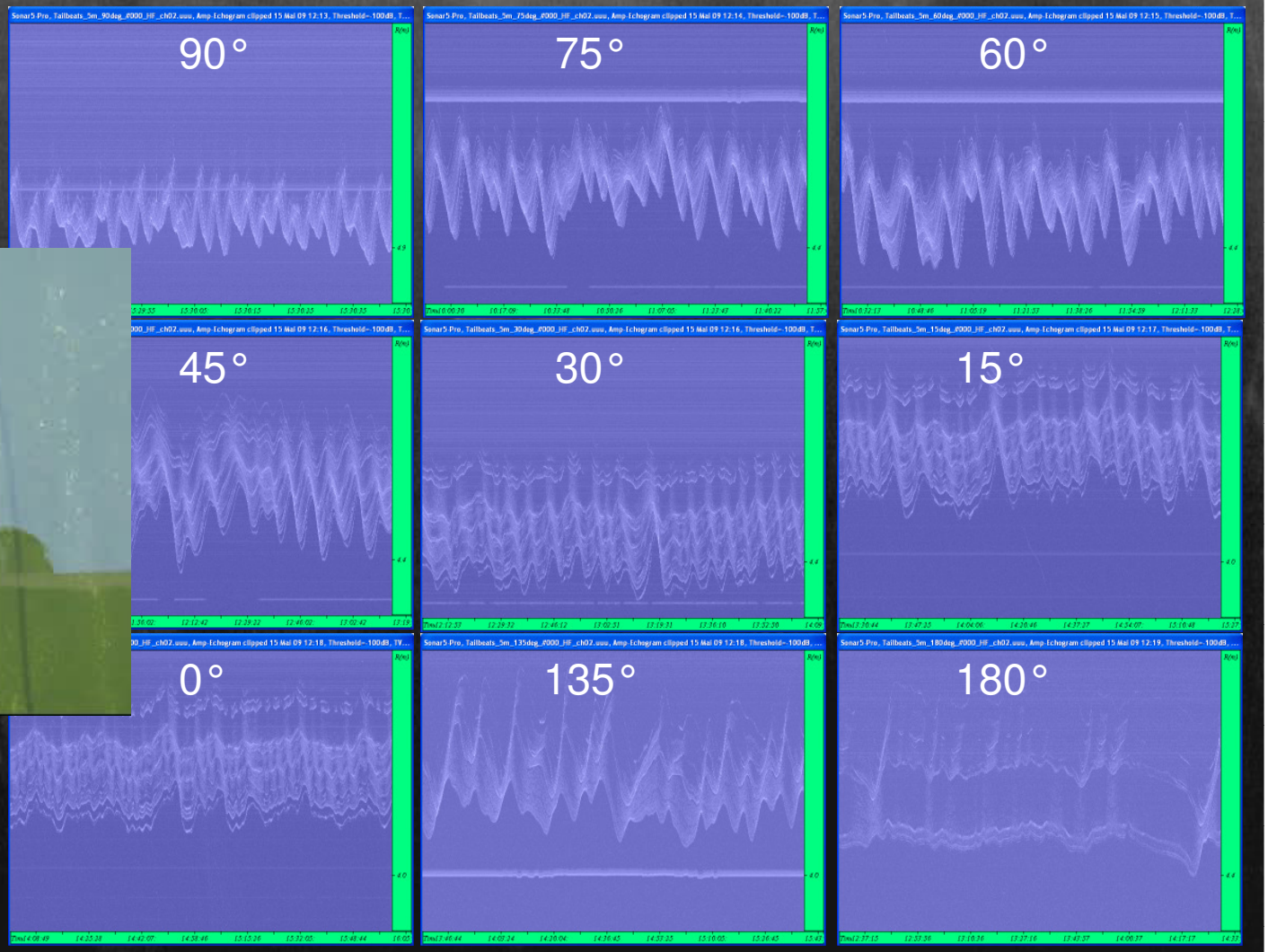



Sonar5-Pro Bf50_2m_Dist0_45deg_#002_HF.ddf, Frame=282, Clippe...
Sonar5-Pro Barb50_2m_Dist0_45deg_#002_HF.ddf, Frame=211, Clip...
Sonar5-Pro Br50_2m_Dist0_45deg_#002_HF.ddf, Frame=79, Clipped...
Sonar5-Pro Doeb50_2m_Dist0_45deg_#002_HF.ddf, Frame=137, Cli...
Menu
frame
Control
Speed
Z(m)
2.85
2.35


Sonar5-Pro Shadows_Barbel_Alu_08-09_day_47er-band_135233_HF.ddf, Frame=1647, Clipped 1...
Menu
frame
Control
Speed
Save
Reset
Z(m)
2.01
1.51
SHAPE 1.3 - Chc2Nef
Files
Help
Discard
Turn 1deg
Turn -1deg
Turn 180deg
Save/Next Obj.
Default Turn 0deg
Barbe
a
b
c
d
1 1,000000E+00 1,330299E-15 1,415963E-16 3,468718E-01
2 -7,420156E-02 -3,312738E-02 -1,611579E-01 -7,711357E-02
3 1,555612E-01 4,327268E-02 1,264371E-02 2,852945E-02
4 -8,027513E-03 1,956204E-02 -4,770232E-03 2,913915E-02
5 -5,919689E-03 2,205151E-02 9,715247E-03 6,360185E-02
6 -2,307990E-03 -1,928976E-02 -9,638253E-03 -1,209094E-02
aaa.chc -> aaanef
Harm Num: 20
Obj.Num.:4
Save Num:3
Discard Num:0



Schlagfrequenzen/ Schwimmmuster/ Amplituden



Schlagfrequenzen („Tailbeats“) und Winkelaspekt

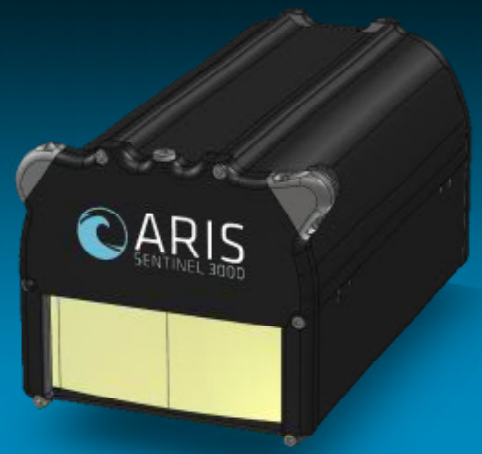
SOUND METRICS

Depth Rating 300m | Inspection Mode 3.0 MHz | Detection Mode 1.8 MHz

ARIS SENTINEL 3000

The next generation in image clarity.

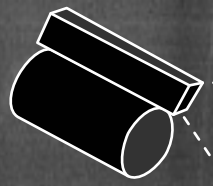
The ARIS Sentinel 3000 boasts 128 beams operating at 3 MHz, enabling it to collect more data than any imaging sonar in its class. The result? Unmatched image clarity, even in the most turbid water. Powerful and compact, the Sentinel 3000 is ideal for ROV/AUV integration. And it's designed for low maintenance, making it reliable in waters from the arctic to the equator. For longer-range applications, 1.8 - 1.1 MHz and 1.2 - 0.7 MHz models are available. Regardless of your needs, you'll find the new ARIS line is built to deliver in the real world.



Download Specifications *soundmetrics.com* *Contact Info* *About Sound Metrics*

Innovative Entwicklungen

Kosten & Praxistauglichkeit



DIDSON-Sonar	~ 100.000 €
Pan & Tilt	~ 10 -20.000 €
Zusätzliche Hardware (Big Lens etc.)	~ 15.000 €
Software	~ 10-20.000 €
Portable Montageeinheit	~ 5.000 €
	~ 140-160.000 €

Know-how/ Personal…


COMPASS

Landesfischereiverband Westfalen und Lippe e.V.

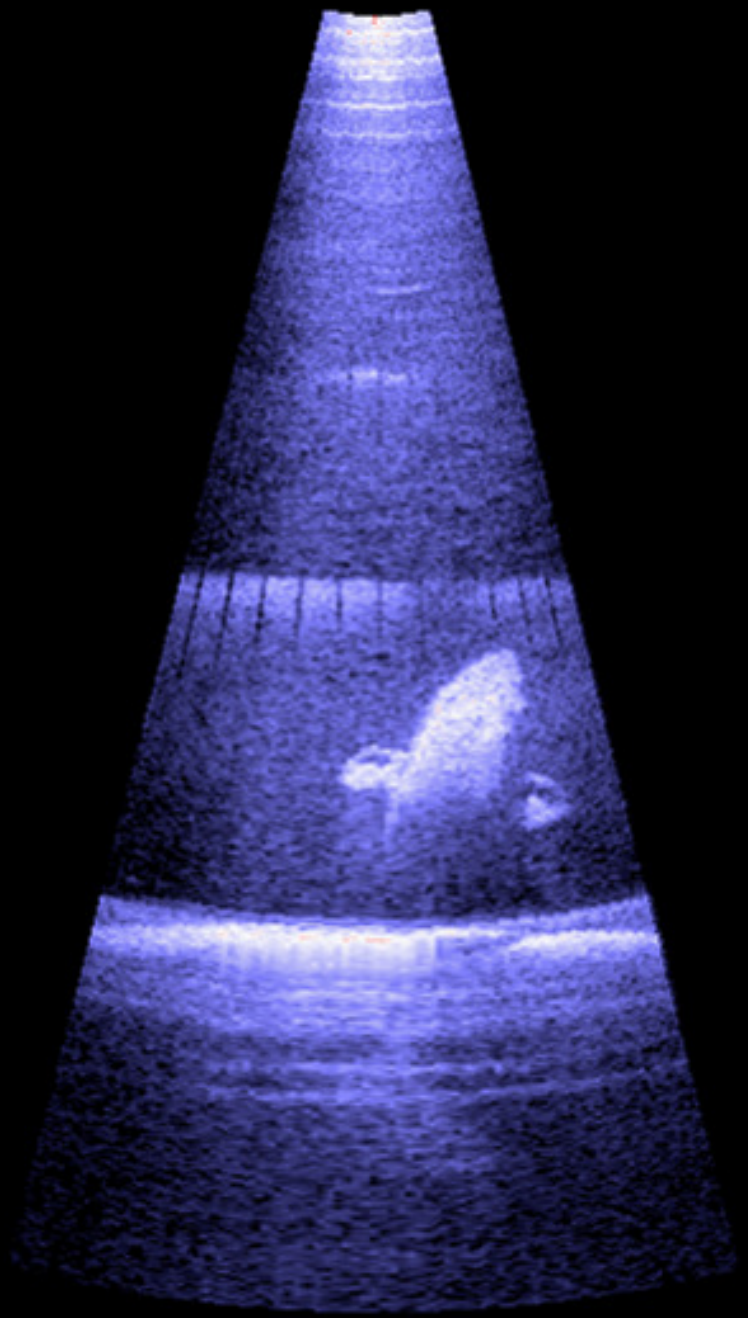
– Hydroakustik –

schmidt@lfv-westfalen.de
langkau@lfv-westfalen.de

www.lfv-hydroakustik.de

Vielen Dank

für Ihre Aufmerksamkeit



Dr. Marc Schmidt

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Fax 0251 48271-29
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