EESTI SÕUDETREENERITE SEMINAR

FISA COACHES CONFERENCE, HEATHROW 2018

PRIIT PURGE

South African Rowing 2009 - 2017

Tailoring a Performance Environment

Tom Dyson - Chief Coach, Paralympic Programme GBR

Rowing Instrumentation & Technology

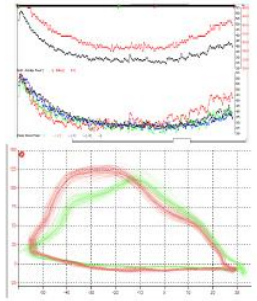
BIOROW
BIOMECHANICS OF ROWING

Dr. Valery Kleshnev
BioRow Ltd.
www.biorow.com
valery@biorow.com

webasport

Oar Power Meter

Capturing Data and Using Technology



Conny Draper, PhD
Applied Sports Biomechanist
Consultant
conny.draper@gma

Barriers and Supports for Female Rowing Coaches

What Can We Do?

MyPerfectCoach
Train hard when you can and easy when you need

ROWE.RS

How the Rowers platform can help drive Performance

MATERJALID JA ETTEKANDED

HTTP://WWW.WORLDROWING.COM/EVENTS/2017-WORLD-ROWING-COACHES-CONFERENCE/EVENT-INFORMATION

South African Rowing
2009 - 2017

South African History at Olympic games

- 1992 / 1 boat – 8+ 8th
- 1996 / 3 boat – LM4- 9th / W2- 11th / M2- 16th
- 2000 / 3 boat – W2- 5th / LM4- 5th / M2- 6th
- 2004 / 1 boat – M2- 3rd
- 2008 / 3 boat – M2- 5th / W1x 13th / LW2x 14th
- 2012 / 2 boat – LM4- 1st / W2- 8th
- 2016 / 5 boat – M2- 2nd / LM2x 4th / M4- 4th / LW2x 5th / W2- 5th

OLULINE

- LAHENDUSELE ORIENTEERITUD
- MEESKONDLIKULT JUHITUD
- TUGIMEESKOND
- PÕIMUMINE

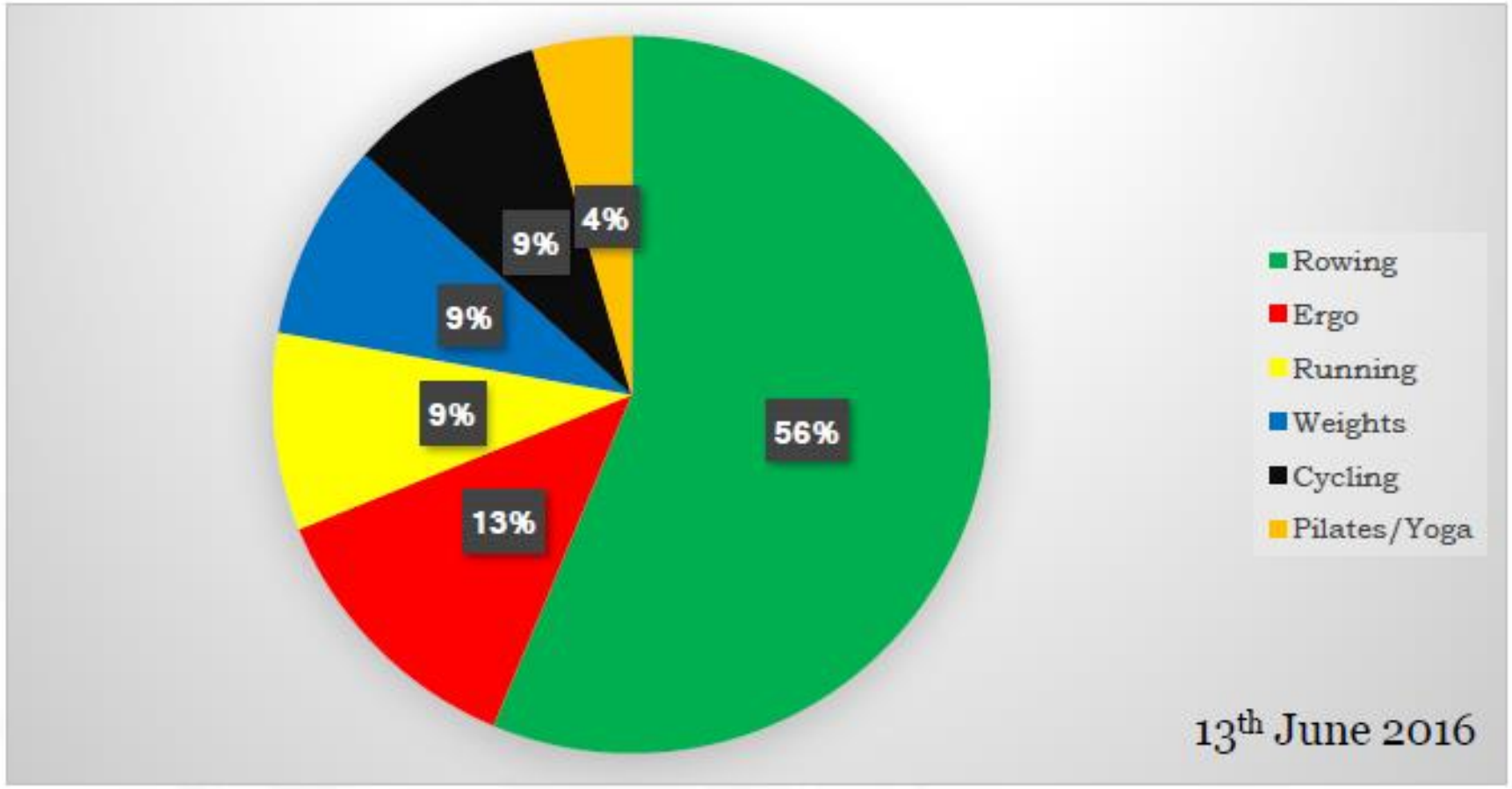
PÕHIFILOSOOFIA

- TREENI KUI MEESKONDA
- TREENINGUD KOOS ÜHES KOHAS
- VÕITLUSLIK KESKKOND
- PIDEV KONTROLL JA TESTIMINE

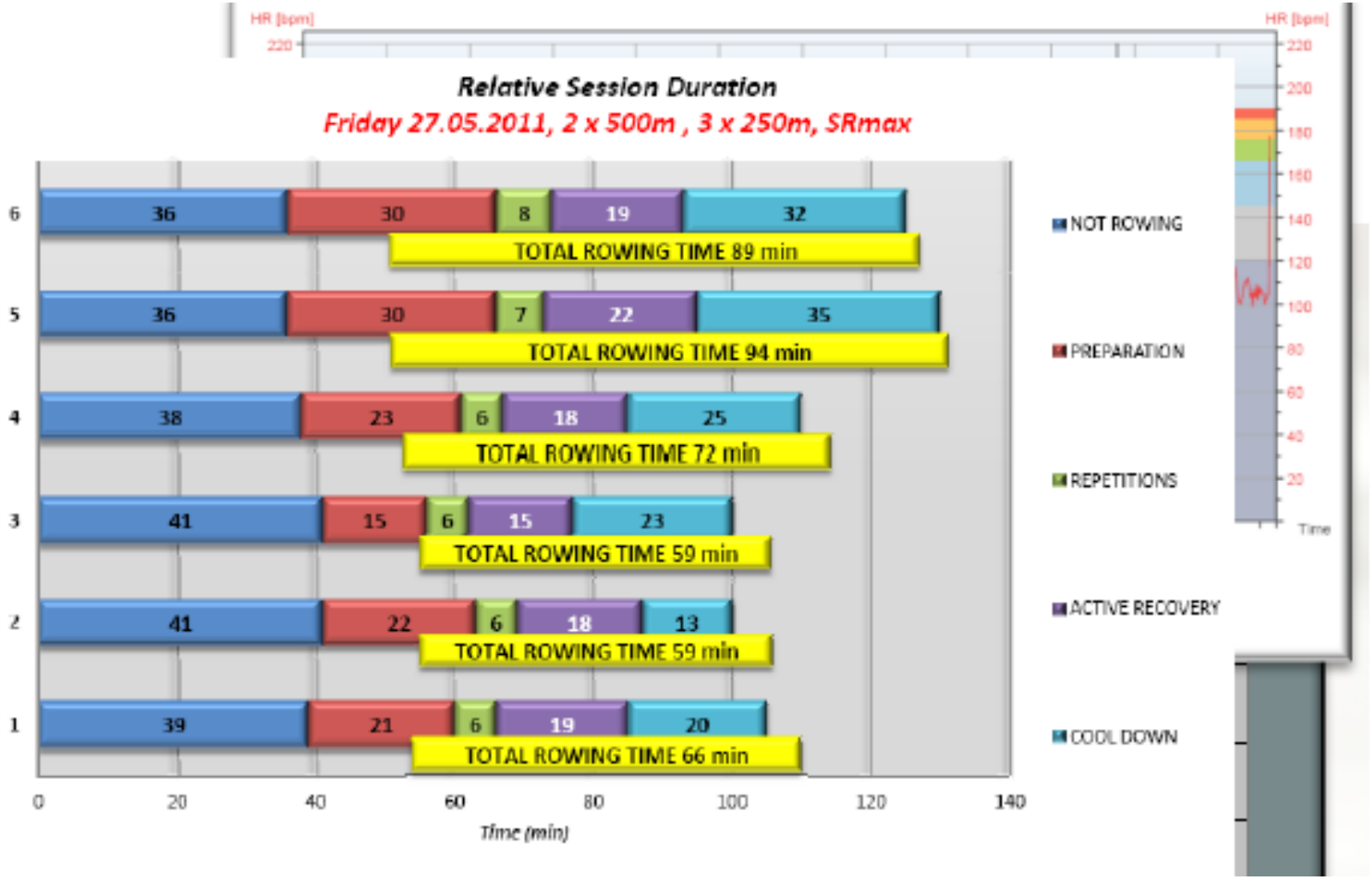
HEA ETTEVALMISTUS

- VÕISTLUS ON VÕIDETUD JUBA ÜKS KUU ENNE VÕISTLUST
- TREENINGUD LÄBI AASTA
- JÄTA VAHELE VÕIMALIKULT VÄHE TREENINGUID
- POLE OTSETEID
- TÄHELEPANU DETAILIDELE
- TEHNIKA

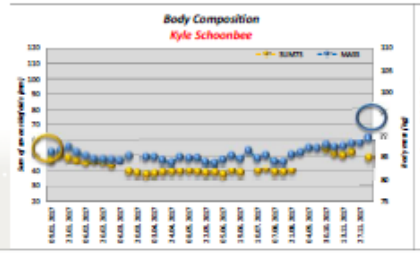
Training %

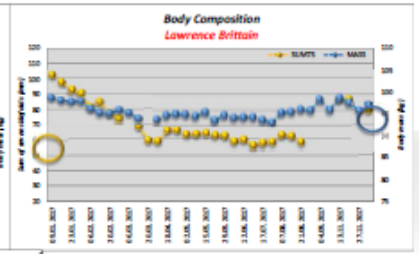

56%
13%
9%
9%
9%
4%
Rowing
Ergo
Running
Weights
Cycling
Pilates/Yoga
13th June 2016

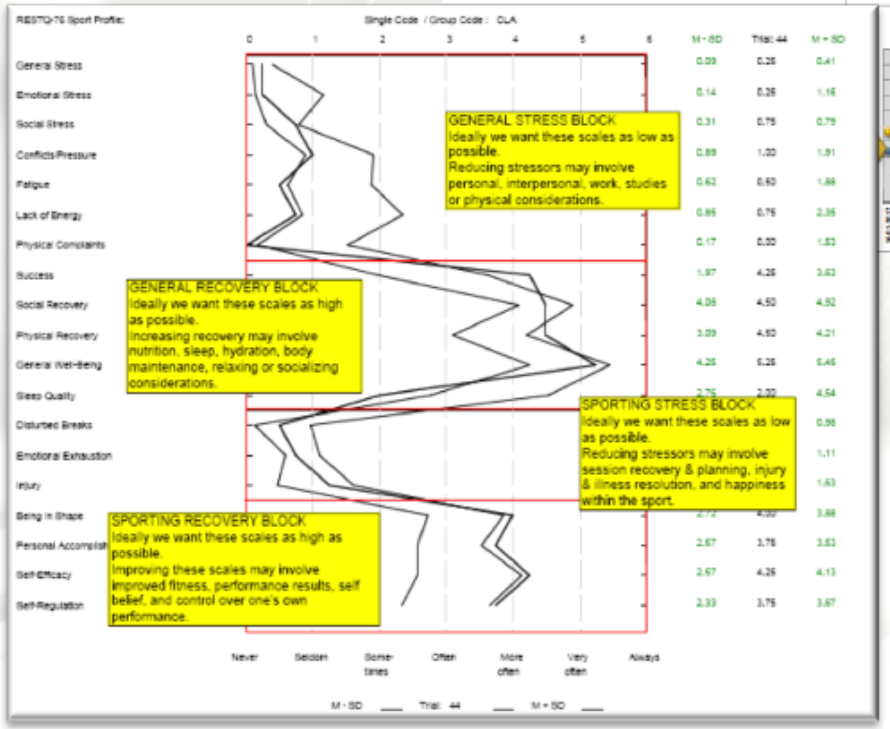
Training Status & Physiology

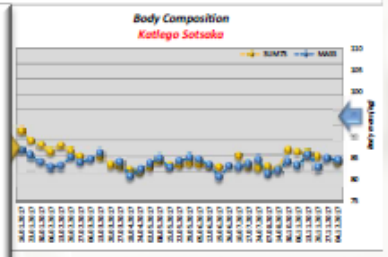


Athlete Monitoring

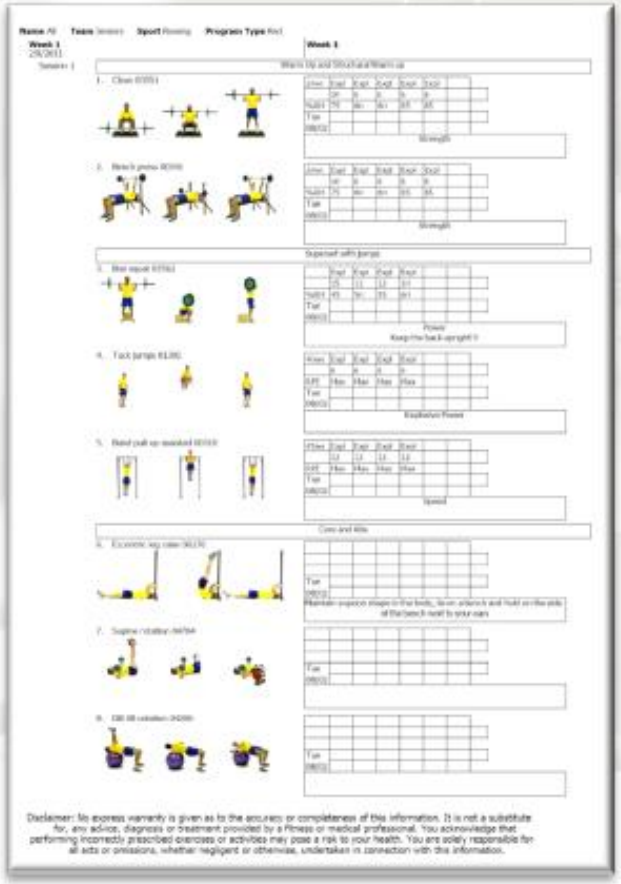








NATIONAL SQUAD
THINKING. PULLING. TOGETHER.



Strength & Conditioning

TREENINGKOHAD

- Roodeplaat Dam (1300m) (Home Base) Pretoria
- Ebenezer Dam (1350m)
- Tzaneen Dam (700m)
- Katse Dam (2050m) Lesotho

Roodeplaat Dam
1300m

- 5km 1 direction
- Summer 30 c
- Winter 18c
- 8 lane 2000m

Ebenezer / Tzaneen Dams
1300m 700m

- 10km 1 direction
- Winter temp 18 c
- Isolated

- 8km 1 direction
- Winter temp 25 c
- Danger of hippos

Katse Dam
Kingdom of Lesotho (2050m)

- 42km 1 direction
- Summer temp 22 c
- High humidity
- Very Remote - Safety

VÕITLUSLIK KESKKOND

- IGAPÄEVANE RIVAALITSEMINE
- EI MINGEID VABANDUSI
- EDETABELI SÜSTEEM
- KÕIK ON KOONDISE VAATEVÄLJAS
- VIGASID MÄRGATAKSE JA SELLEST ÕPITAKSE

MAJANDAMINE

- TREENERID
  - TÄISKOHAGA TREENERID (2 TREENERIT)
  - VABATAHTLIKUD
- TAUSTAJÕUD
  - ARST
  - FÜSIOTERAPEUT
  - FÜSIOLOOG
  - JÕUTREENINGU SPETSIALIST

FINANTSILINE POOL

- RAHA AITAB KUID POLE ALATI KÕIGE OLULISEM
- RAHA SUURUS EI OLE SEOTUD MEDALITE ARVUGA
- KUI PALJU OLEKS RAHA VAJA?
- ABILISED
    - RIIKLIKULT 375 000 EUR
    - SPONSORID 123 000 EUR
    - PRETORIA ÜLIKOOL

Rowing Instrumentation & Technology

Dr. Valery Kleshnev
BioRow Ltd.
www.biorow.com
valery@biorow.com

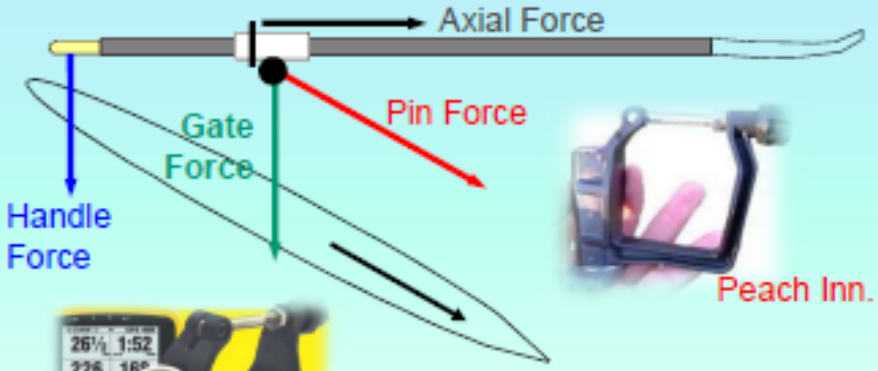
BioRow Vision:

To continue the process of creation of this World by means of discovering new phenomena and inventing new things, even in such a “simple” thing as rowing

BioRow Mission:

To help those rowing people, who are curious enough, to improve rowing technique and row smarter and faster, by means of essential measurements, objective analysis and practical feedback

What is best method to measure rowing power?



Peach Inn. Ltd.

NK EmPower oarlock

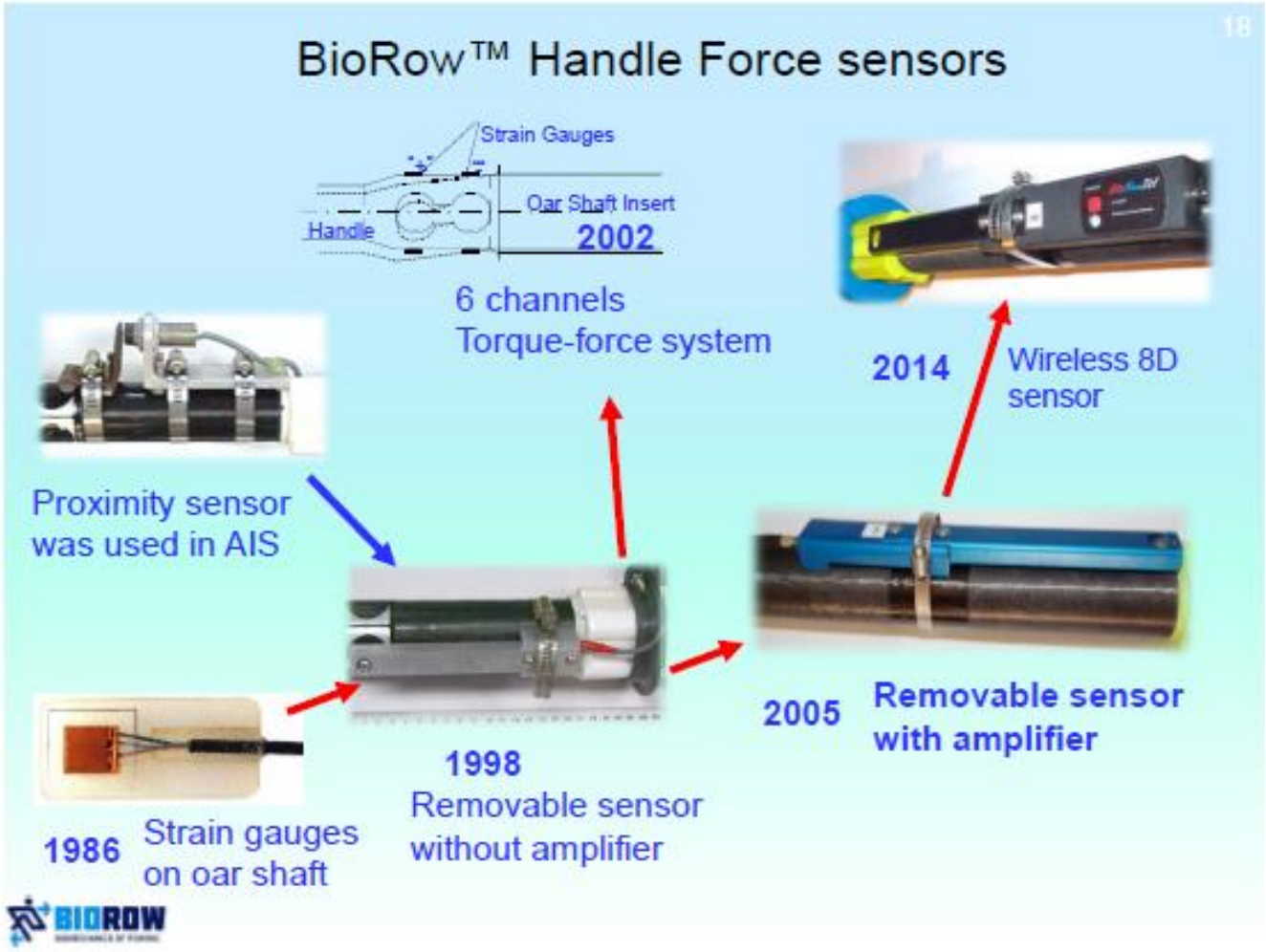
In all systems, the traditional method (Handle Power) is used anyway, because only one force is measured

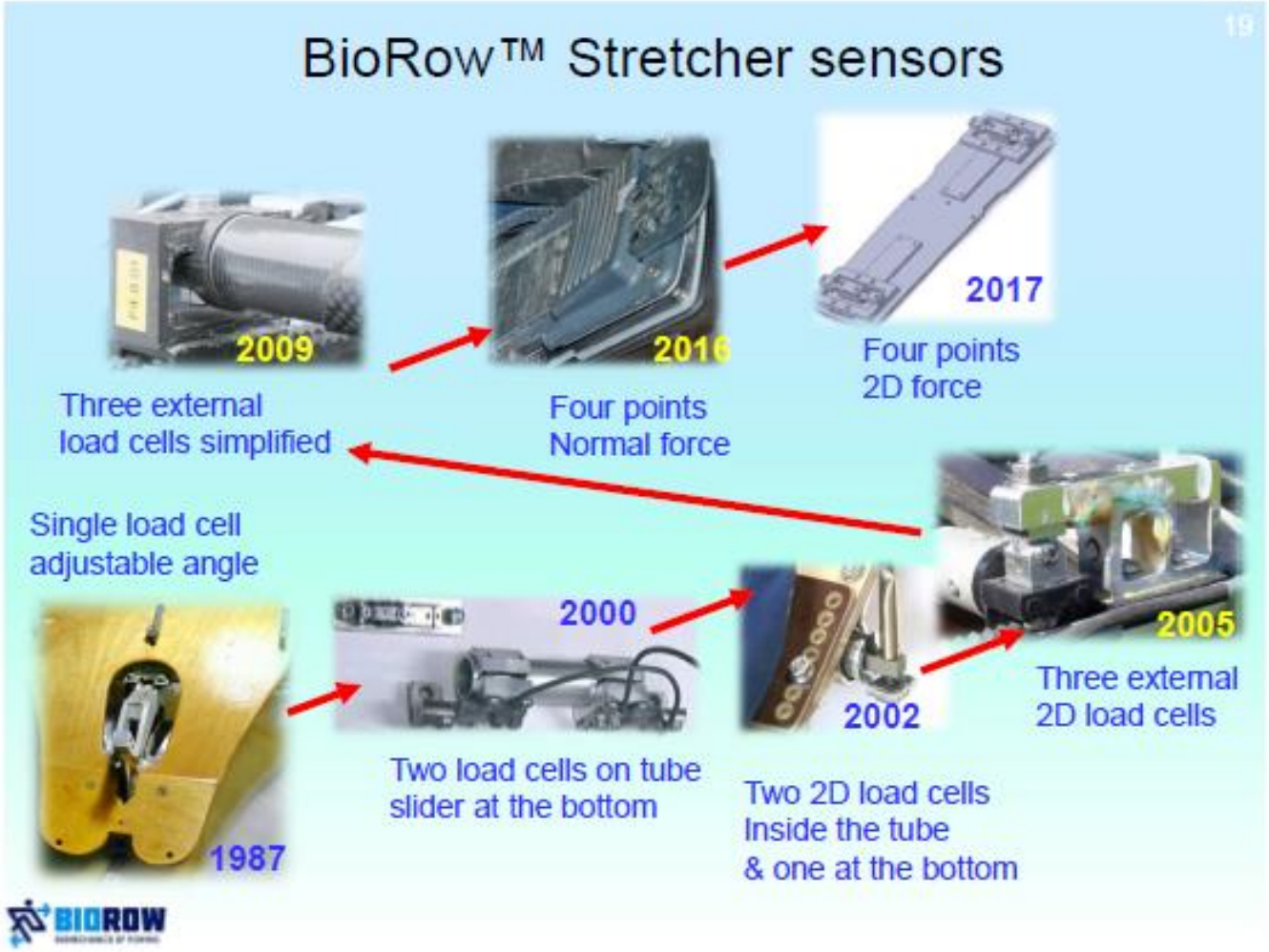
- ✓ Handle Force gives the most accurate power measures, but require calibration of every oar.
- ✓ Pin Force is affected by oar angle and axial force, so power inaccuracy could be up to ±20%;
- ✓ Gate force require inboard for power calculation, which could vary during the drive ±5%;

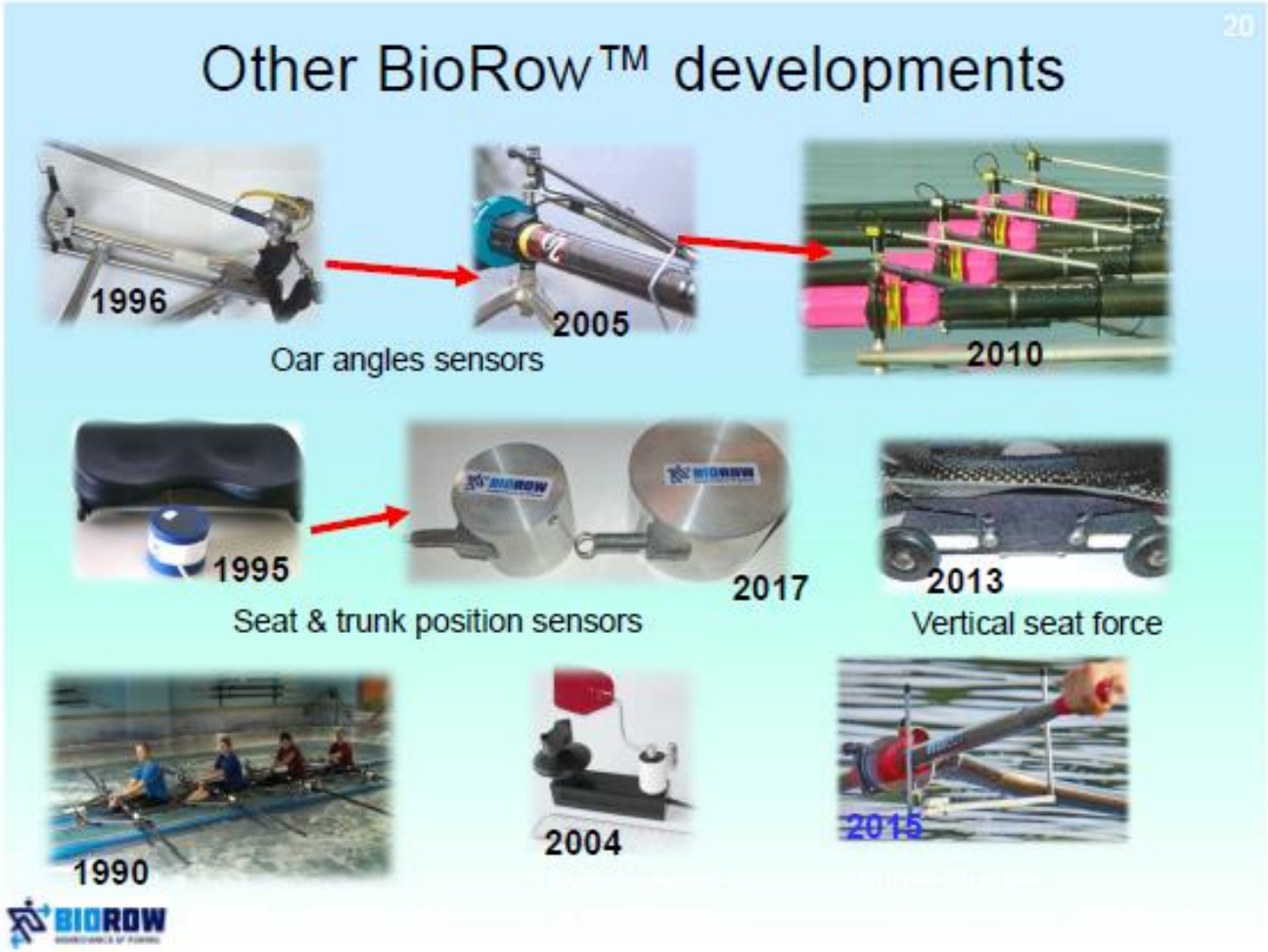
Estimation on rowing instrumentation

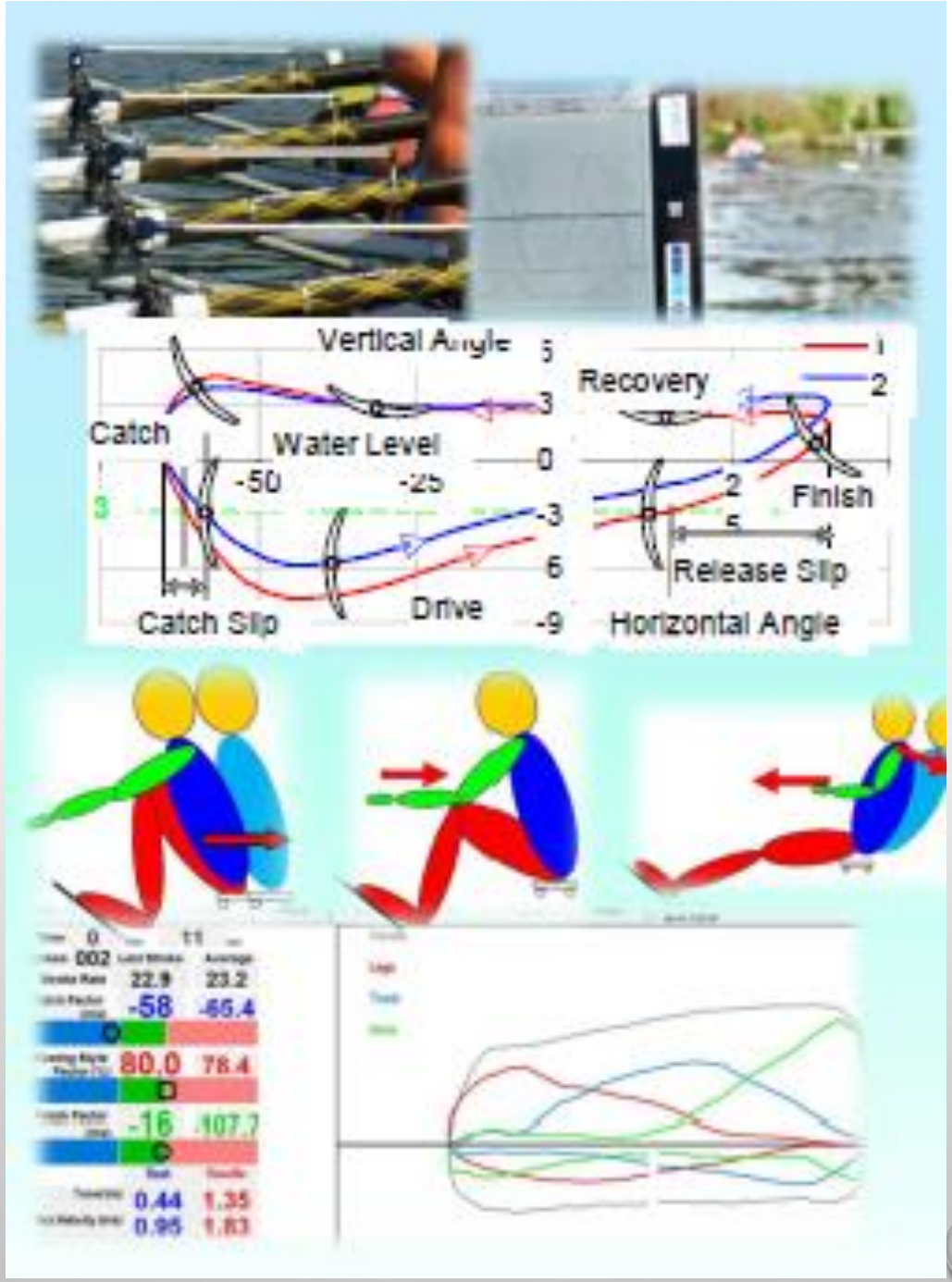
	Product	Practicality	Complexity	Technology
	NK EmPower oarlock	8	3	7
	BioRowTel system (standard)	5	8	5
	Peach Inn. system	7	4	6
	Video analysis	5-10	1-10	1-10

BioRow™ developments in instrumented oarlocks
17
Referenced by Peach Inn.
WEBA RowX
2001
2014
NK EmPower
1987
2 Ring sensors
2000
AIS gate
2011
Rotating cylinder load cell
4 Ring sensors & angle
1988
1992
Rotating pin
2005
Rotating binocular-shape load cell
BIOROW


18
BioRow™ Handle Force sensors
Strain Gauges
Oar Shaft Insert
Handle
2002
6 channels
Torque-force system
2014
Wireless 8D
sensor
Proximity sensor
was used in AIS
2005
Removable sensor
with amplifier
1998
Removable sensor
without amplifier
1986
Strain gauges
on oar shaft
BIOROW


19
BioRow™ Stretcher sensors
2009
Three external
load cells simplified
2016
Four points
Normal force
2017
Four points
2D force
Single load cell
adjustable angle
1987
2000
Two load cells on tube
slider at the bottom
2002
Two 2D load cells
Inside the tube
& one at the bottom
2005
Three external
2D load cells
BIOROW


20
Other BioRow™ developments
1996
2005
2010
Oar angles sensors
1995
2017
2013
Seat & trunk position sensors
Vertical seat force
1990
2004
2015
BIOROW


Vertical Angle
Catch
Water Level
-50
-25
Catch Slip
Drive
Recovery
Finish
Release Slip
Horizontal Angle
5
3
0
-3
6
-9
1
2
22.9
23.2
-58
-65.4
80.0
78.4
-16
107.7
0.44
1.35
0.95
1.83

webasport

Oar Power Meter

is a coaching tool that directly measures:

- Time
- Stroke rate
- Force
- Peak force
- Force peak vs. Angle
- Power
- Peak power
- Heart rate
- Angle
- Slip angle
- Wash angle
- Speed
- Pace 500m
- Pace 2000m
- Distance
- Distance per stroke
- Calories
- Active time
- Passive time

OPM installing

Designed to fit to sweep or scull

Turn on OPM by swiping a magnet over the green mark.

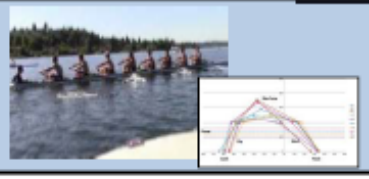
Technology to Make the Boat Go Faster

1. *NEXT STROKE* improvement
2. *QUANTITATIVE feedback*
3. *SUPPLEMENTAL* to your standard practice
4. *EVERY DAY* tool

Technology to Make the Boat Go Faster

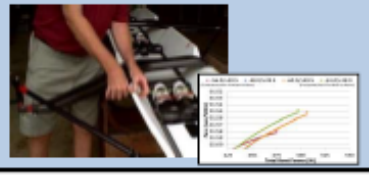
Optimize Athletes

- Technique
- Strength & Conditioning



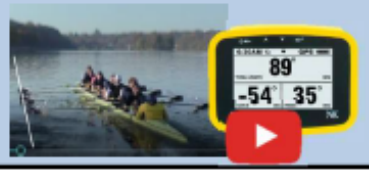
Optimize Lineup

- Selection
- Order



Optimize Equipment

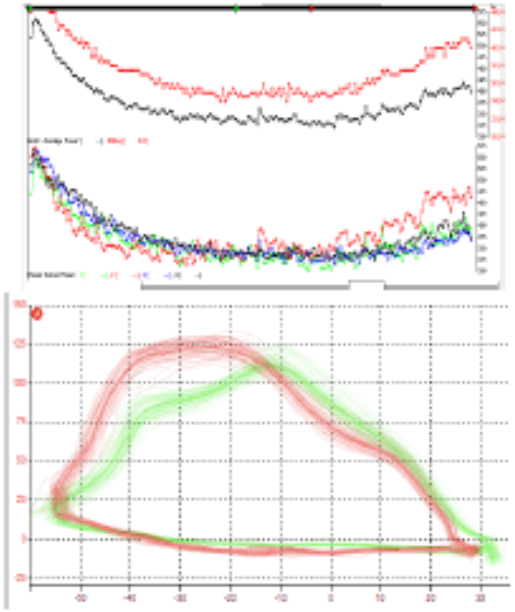
- Selection
- Rigging



Optimize Coordination

- Do the same thing
- Do it together

Capturing Data and Using Technology



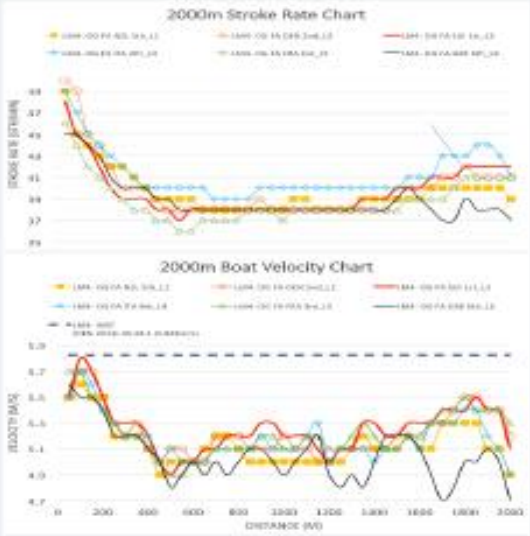
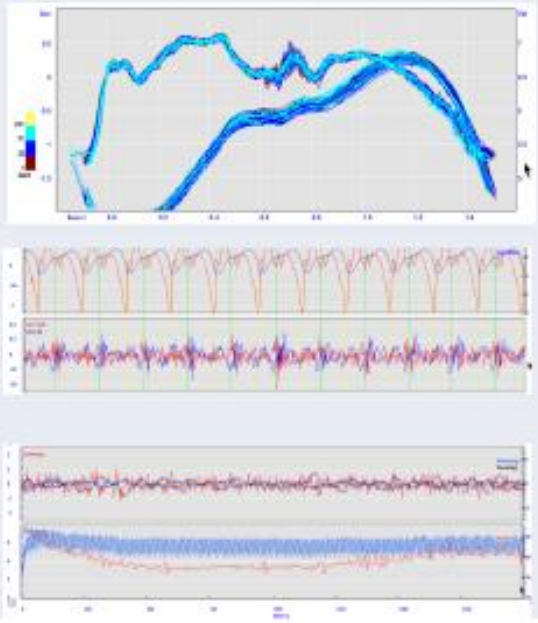
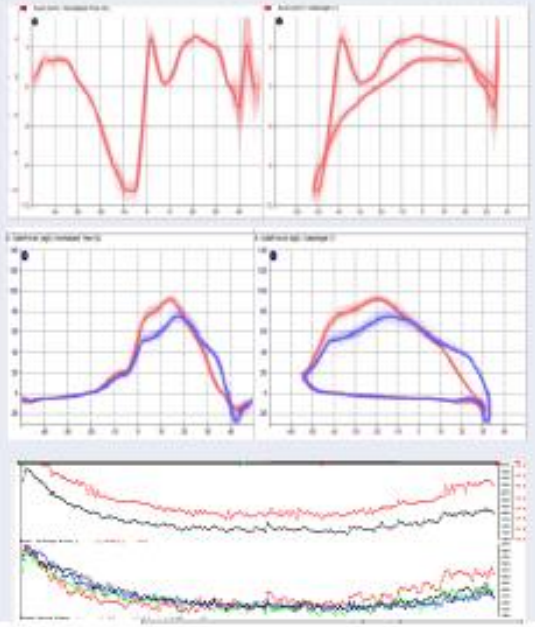
Conny Draper, PhD

Applied Sports Biomechanist
Consultant
conny.draper@gmail.com

Coaching & objective Assessment during Training

Ergometer	On-water	Rowing tank
Load regulation	Technique & performance assessment	Movement regulation
Conditioning training	On-water technique training	Additional technique training

Biomechanical On-water Analysis & Feedback

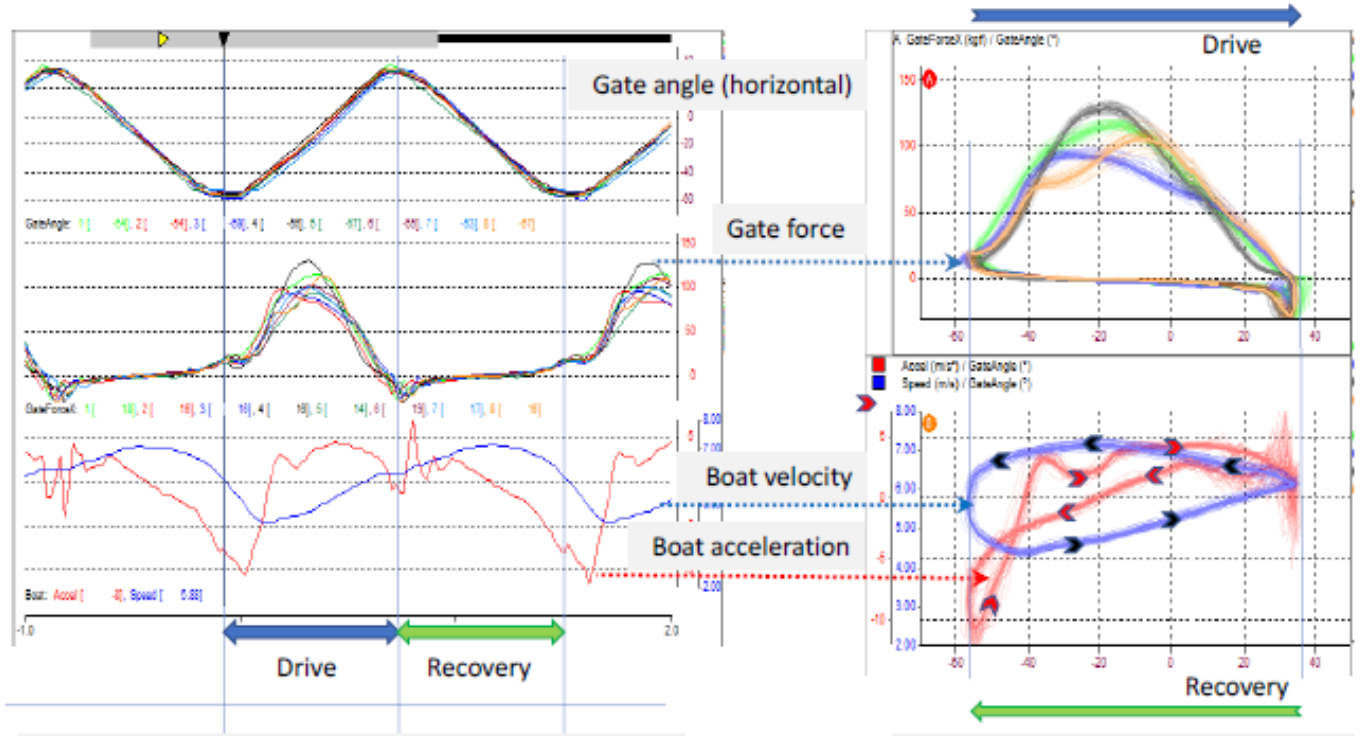
FISA GPS Racing System (Swiss Timing)	GPS Monitoring System (i.e. Catapult 'MinimaxX')	On-water Rowing Instrumentation System (i.e. Peach Innovation)
Public Racing information of up to 6 crews/ race - Stroke rate & Boat speed/ 50m	Training monitoring/ racing tool to assess boat-specific performance & boat motion information	Training monitoring/ racing tool to assess athlete & boat specific performance & boat motion information
		

Graphical description of Rowing technique

Characteristic 'rowing' curve patterns (same data set – different display)

1. 'Time' Scale (cont. stroke by stroke)

'Gate angle' Scale (cont. sbs)



X-axis: Time (s) – continuous time scale

X-axis:Gate angle (horizontal) (deg)

Assessment Tools - Intervention Tools (for real-time feedback)

...for Technique/ Performance Improvement

- Technical drills
- Telemetry measurement with appropriate feedback

- Video filming in conjunction with telemetry or separately
- Visual Immediate Feedback System (Virtual Realty Goggles)

- Sensory-Mechanical Feedback
- Sonification (Online acoustic information)