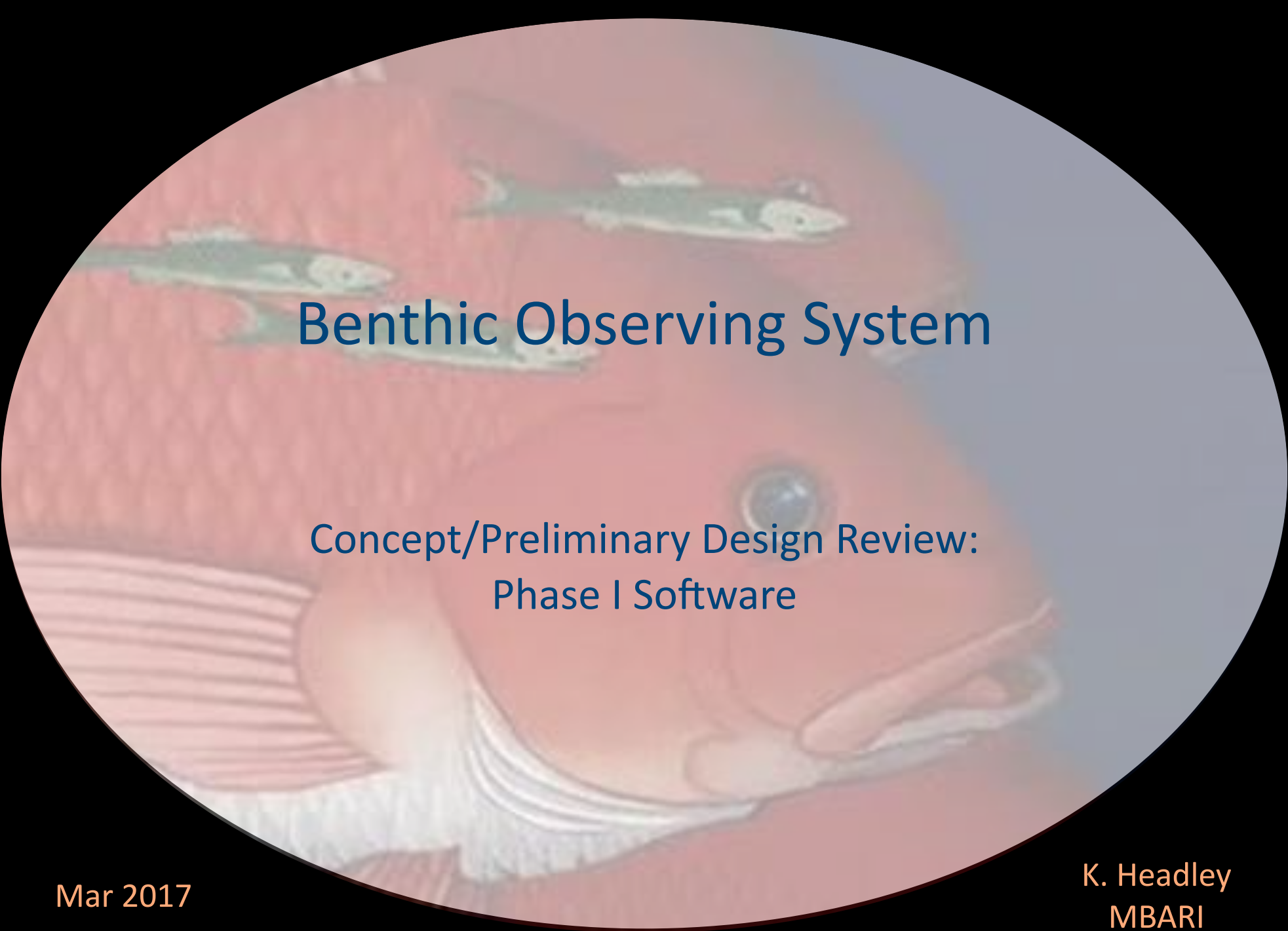




Benthic Observing System

Concept/Preliminary Design Review:
Phase I Software

Mar 2017

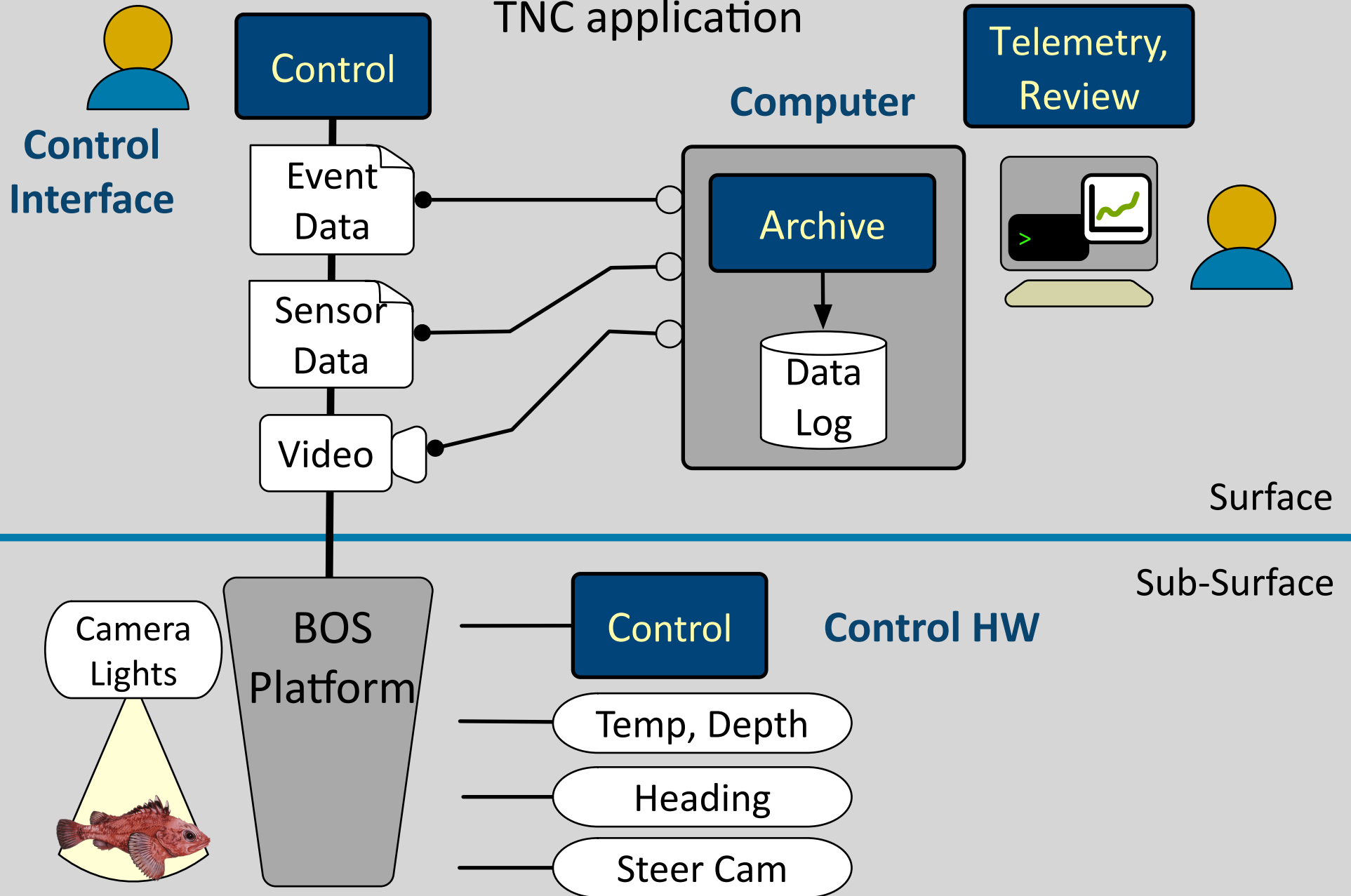
K. Headley
MBARI

Content Outline

- Where the software lives
- CART : Functions, requirements, options
- At the corner of software and hardware
- Implementation approaches
- Selection and recommendations

BOS: Where Software Lives

TNC application



CART: Required Software Features

Control

- Power control
- Start/stop recording

Review

- Data workflows, post-op

Telemetry

- Sensor data
- Video

Archive

- Record timestamped data
- Contextual sensors:
 - Temperature, depth
 - Heading, [pitch, roll?]
- Control events:
 - Camera/lights power
 - Start/stop recording

Optional Features

- **Configuration**
 - Sample rates
 - Instrument configuration
- **Computation**
 - Parse data in real time
 - Generate new derived data streams
 - e.g. turns count

Constraints : Design Goals

- Minimize software development for first iteration
- Architect for future expansion
 - TBD contextual sensors
 - Real time, distributed/mobile displays
 - Control interface
 - Configuration
- Keep it Simple:
 - minimal codebase and development environment
- Minimize complexity in the system

At the Corner of HW & SW

Platform selection : combining HW and SW to cover function requirements

HW and SW selection decisions are closely coupled

Hardware choices involve software considerations:

NRE	Lifecycle
HW/SW Cost	Power
Firmware	Sampling Performance
Compilers, Tools	O&M, Tech Transfer
Integration	

Implementation Approaches

- Many options to satisfy requirements
- Key decisions: HW/SW, Build/Buy

Platform Technology Options

Hardware

PC
PLC
COTS Relay
Stream Logger
General Logger
COTS Embedded

Software

Wedge
LabView
Vendor Utils

Selection Criteria

- CART Coverage
- Cost
- Schedule
- Performance
- Risk
- Tech Transfer
- Roadmap

Buy

Build

OASIS
MMC
BOS new HW

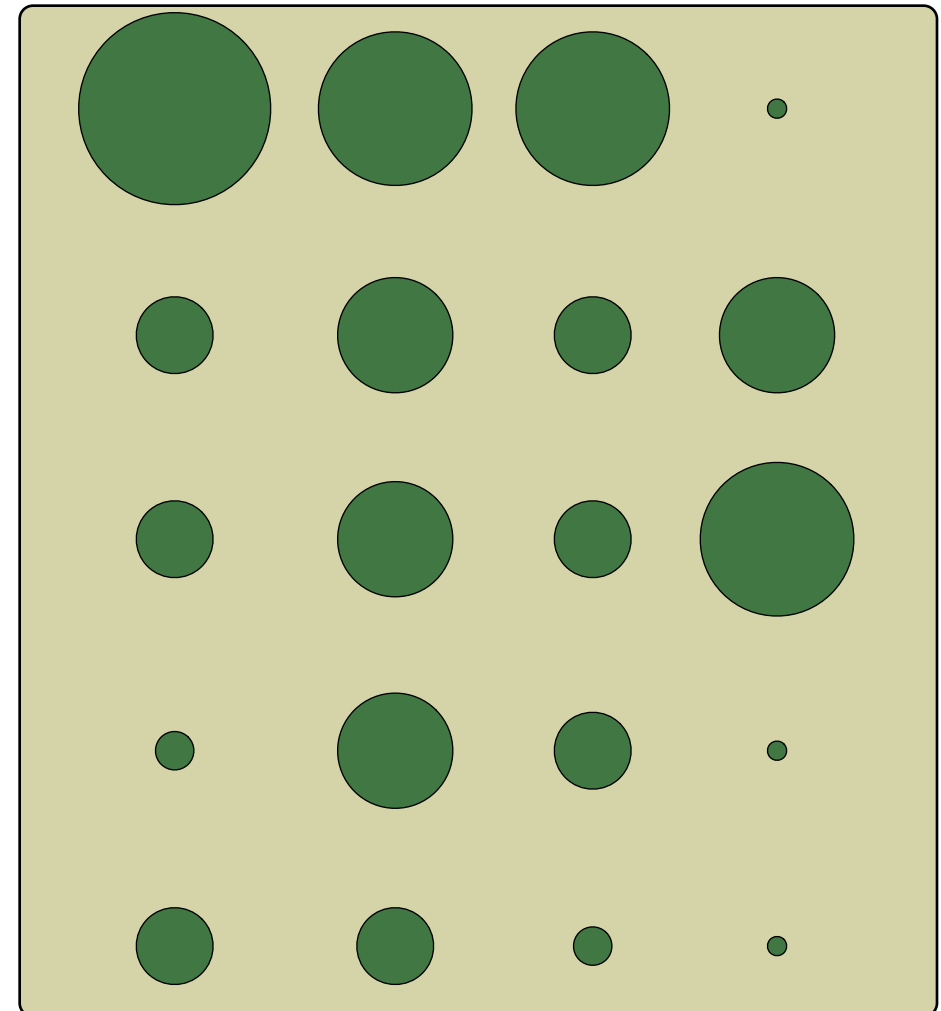
OASIS
Flux
SIAM
BOS new SW

Comparison of Selected Platforms

Circle size : Relative advantage

- Low Cost
- Easy to use
- Best Option for TNC
- Not good fit for untethered design
- Distributed or autonomous use
- Moderate power
- Reliable, low power
- Moderate integration effort required
- Potential candidate for untethered design

Platform	
	PC, PLC Wedge
	PC, COTS Ctrl Flux
	PC OASIS
	PC, COTS Ctrl LabView
	COTS Emb Custom



Touchscreen
Builder

Aggsoft Wedge
Browser
3rd Party Video

TNC BOS
HW/SW Concept

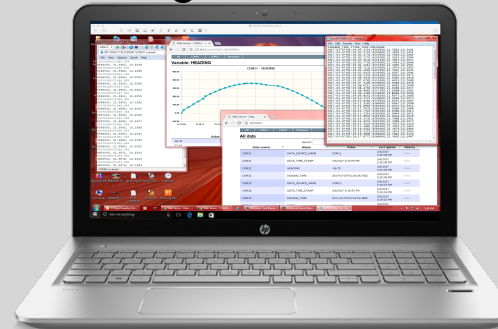
Touchscreen



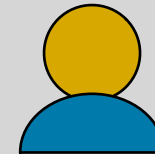
Ladder
Logic



PLC



Windows PC



Surface



BOS
Platform



Ladder
Logic

RBRduet

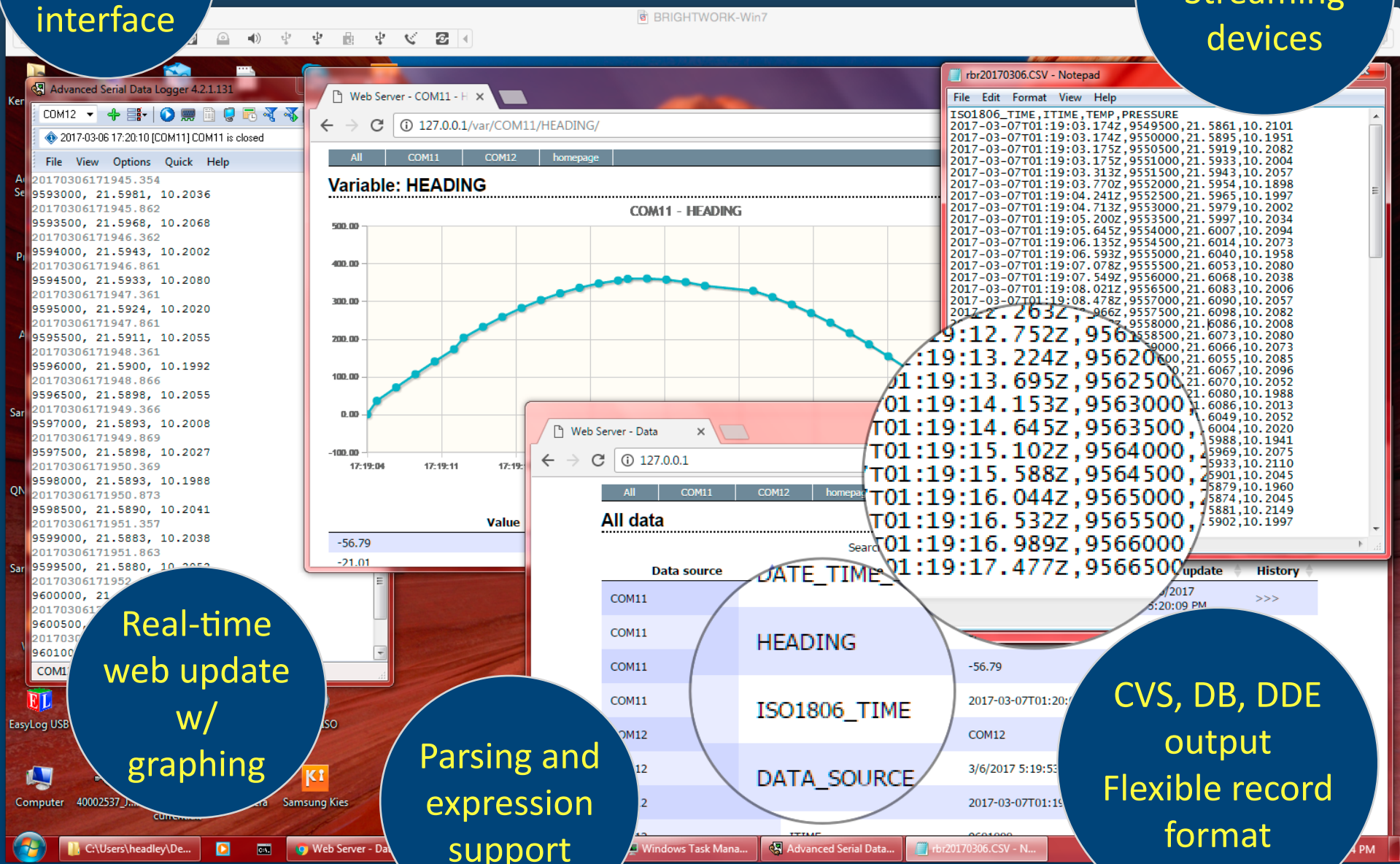


Sub-Surface

Intuitive
user
interface

Screenshot: Aggsoft Wedge Evaluation

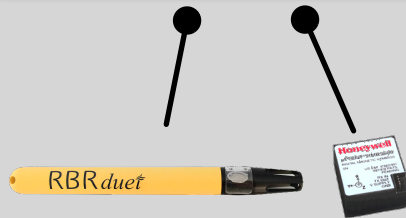
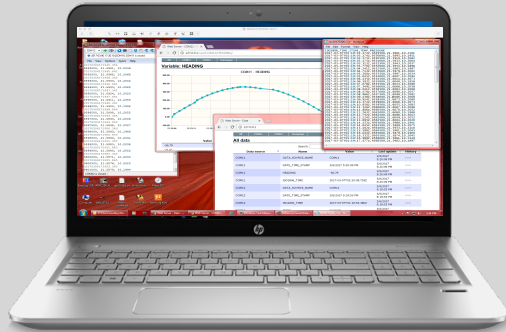
Polled,
Streaming
devices



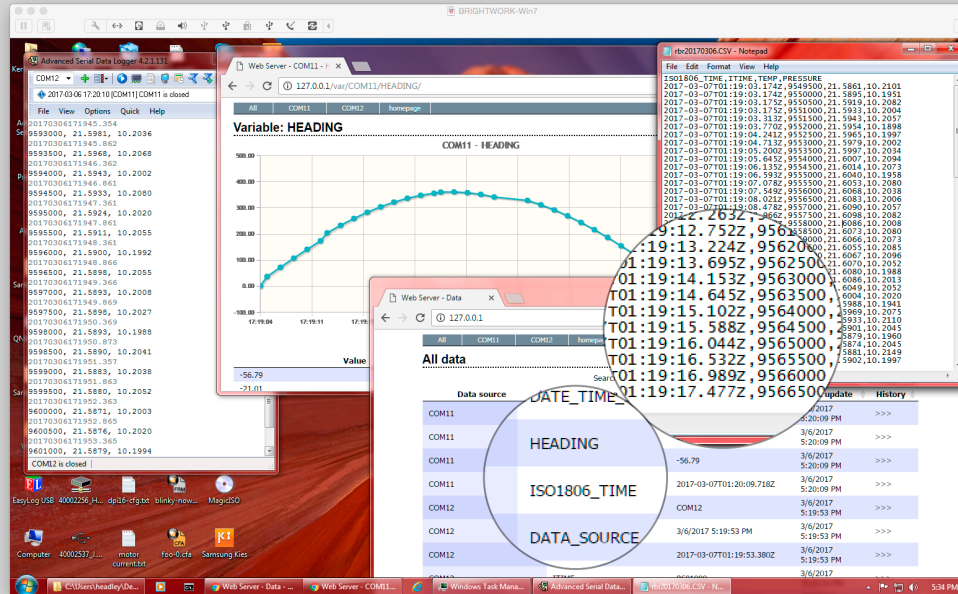


Discussion

Software Data Wedge



Instruments connect to wedge using serial or TCP...



...data is sent to files, a web server, databases, or other applications.

...the wedge acquires data via polling or streams...

...which may be timestamped and/or parsed ...

...even used to create new data via expressions...

