#### 2022 GlobalHAB Symposium

#### **IFCB Industry Perspective**

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#### **McLane Research Laboratories**

- ✤ 22 employees
- 12 product lines
  - Profilers
  - ✤ Samplers
  - Floatation

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 McLane Research Labs. has a long history of supporting the oceanographic science community (est. 1983)







• The IFCB technology transfer and commercialization began in 2011, with the first commercial sale in 2014.





#### IFCB Industry Perspective

- Adaptation of submersible real-time particle imaging systems has shown promising growth since commercialization of IFCB
  - Expanding customer locations
    - Canada, Chile, China, Finland, France, Germany, Israel, Italy, Japan, Norway, Philippines, Scotland, Sweden, Singapore, South Korea, UK, USA
  - Expanding deployment types
    - Shore based, pier, floating dock, underway shipboard, autonomous vehicle, mooring, bottom lander
  - IFCB sales have mirrored this growing market



- Production, Development & Training Facility
  Upgrade
  - IFCB product line moved in July 2021 to a new facility
  - Dedicated 800 ft<sup>2</sup> space uniquely designed for IFCB production
  - Up to 12 work stations for new unit production, in service maintenance and development projects



- Supply Chain Management
  - OTS part lead times have increased significantly
  - McLane stocks most OTS parts in order to support unexpected maintenance
  - IFCB lead time has remained stable for new orders (6-8 months)



- Product Quality & Customer Support Remain Priority #1
  - McLane Engineering staff prioritizes customer support
    - One-on-one remote troubleshooting
    - Expedited parts shipment
    - Remote guidance for maintenance
  - Product quality / reliability is paramount
    - Each IFCB is built to the highest standards by McLane's Engineering staff
    - QA is integral to the IFCB build process
    - Failure mechanisms are identified & managed through close contact with vendors or internal product re-design

### • Product Development / Enhancement

- Linux OS development
  - Migrating away from Windows OS due to stability issues & development limitations
  - IFCBacquire running on Linux OS using Debian 10 with LXDE desktop environment
  - Remote communication using WebSocket API
- IFCBacquire functional enhancements
  - Added user feedback (real-time syringe and valve status)
  - User customizable routines for unique operations
  - Ability to query & tag samples with NEMA GPS stream data
  - Ability to power external sensors / devices (CTD, AML UV Lamp)

### • Product Development / Enhancement

#### - Alternative SBC options for IFCB



- ADLink CM3-BT4 PC-104 SBC
  - X86 architecture
  - 4-core Intel Atom Processor
  - No GPU



- NVIDIA Jetson Xavier AGX SBC
  - ARM architecture
  - 8-core NVIDIA Carmel Arm Processor
  - 512 NVIDIA CUDA GPU Cores
  - Edge Computing: running real-time classification onboard IFCB

### • Product Development / Enhancement

#### - Syringe Assembly Redesign



- Original syringe assembly OTS & involved secondary machining
- Discontinued by vendor



- Syringe assembly redesign made of custom machined parts
- Added robustness / rigidity with slide bearing addition

### Product Development / Enhancement

#### - PivotViewer

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#### Profilers + Samplers + Flotation +

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