Protei
Open Source Sailing Drone

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engineer / hacker - Protei
1. Unsinkable
2. Segmented Articulated
3. Self-righting
4. Self-powered
5. Remotely controlled -> to become autonomous
6. Upwind sailing
7. Oil Absorbant
8. Collision safe Highly visible
9. Sensors controlled
10. Green Affordable

Protei
<table>
<thead>
<tr>
<th>REPURPOSED MANNED FISHING VESSELS</th>
<th>PROTEI GOALS</th>
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</thead>
<tbody>
<tr>
<td>Exposes crew to health risks and toxins</td>
<td>Unmanned and autonomous</td>
</tr>
<tr>
<td>Cannot operate during a storm</td>
<td>Able to operate during extreme weather conditions</td>
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<tr>
<td>Oil sensing limited to human eye sight</td>
<td>Sensing technologies</td>
</tr>
<tr>
<td>Not sustainable, environmentally destructive</td>
<td>Uses renewable energy</td>
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<tr>
<td>Expensive</td>
<td>Inexpensive</td>
</tr>
<tr>
<td>Proprietary design</td>
<td>Open-source hardware</td>
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How Protei implements Open_source Hardware:

**Process:**
- Shared design
- Open feedback loop
- Document development and progress

**Electronic architecture:**
- Use of Arduino, XBee, gps and other sensors

**Mechanical Design:**
- Built with consumer and industrial products
  - power drills, plumbing equipment, salvaged wood
- 3D models are available online for custom milled parts
How Protei implements Open-source Hardware:

Documentation and distribution of information:

The Protei Handbook, available in print and online
Why Open_source?

Collaborative:

- People from all over the world converging to share ideas of Protei’s creation
- We function with an open workflow: horizontal rather than hierarchical chain of command for planning, budgeting, hardware, software, fabrication, design, testing
Why Open_source?

Anybody can build one:

- low cost design
- shortens the time frame for development
Why Open source?

Reappropriated for other purposes

Radioactive plume over Japan

Ocean temperature and salinity data

Sample of plastic garbage

Fishery monitoring in marine protected areas
Protei's goal in use of OSHW

**Fleets of DIY sailing drones**

- Protei needs users (people to build and deploy it)
- Networks of autonomous vessels
- Boats controlled by onshore gamers, fishermen, etc.

*Images:

- *Centralized swarm*
- *Decentralized swarm*
- *Multi-platform network*
Open_hardware and Intellectual Property

<table>
<thead>
<tr>
<th>Object, mechanical design</th>
<th>Documentation, texts, photos, videos, communication materials</th>
<th>Source code</th>
<th>Name, trademark</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="open_hardware" /></td>
<td><img src="image" alt="Creative Commons BY-SA" /></td>
<td>![GNU General Public License, version 3 (GPL-3.0)]</td>
<td><img src="image" alt="US trademark regulation #85339997" /></td>
</tr>
</tbody>
</table>

**Licenses that fall under the definition of Open_hardware**

- Licenses chosen according to the content of work that they protect
- The aim is that all of our materials can be studied, modified, reproduced, redistributed, with the credit of Protei.org
Challenges Protei faces using OSHW

- Documentation takes organization and time
- Uniting many disciplines
- Encouraging continuous feedback
- Maintaining a sustainable business
- Efficiency in chain of command
Ways to find out more about Protei, even how to build one yourself

Protei website: protei.org
flickr: www.flickr.com/groups/protei
kickstarter

- documentation of work processes
- current events related to Protei
- the Protei Handbook

Github:
https://github.com/Protei/Protei-005-6

- source code
- orthographic views of parts
- SolidWorks files

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THANK YOU!