Ropeless Gear
A brief summary by Fran Recht, PSMFC

See presentation 8 in link that Amanda send out for the Ropeless Gear Workshop for more information
Requirements

• The position and orientation of traps (singles) or trawls must be available to fixed and mobile fishermen
  • Trap/trawl positions should be available to non-owners only when on scene near the gear
• Enable commercial chart plotters to display the positions of acoustically marked fixed gear so fishermen don’t set/run over other’s gear
• Registration/permit information must be available to enforcement

Instead of surface buoys and lines—using acoustics to mark gear locations
• Acoustic modems allow data to be passed through water via acoustical waves (the way cell phone modems allow data to be passed through air via radio waves)

• Modems are installed on boats that are fishing fixed or mobile gear

• Modems on the traps report information to the modems on passing boats

• Information is relayed to a data warehouse when a ship returns to shore
Data sent from trap to ship:

**Public data**
Last known position of trap (GPS/ranging)

**Private (encrypted) data**
Last surface date/time
Fisherman’s registration number
Unique device identifier
User-designated identification number
Sensor data (e.g., trap occupancy)

What Owner/Enforcement can see

What other vessels see (on plotter)

Data sent from trap to ship:

**Public data**
Last known position of trap (GPS/ranging)
Data warehouse (cloud) operated by
- Private company
- Fisheries commission
- Government

Fisherman-only their info
Enforcement Regulators

Gear that moves from its deployment location can be located
- All vessels with modems automatically report to the data warehouse the locations and private data of all the trap modems with which they communicated while at sea

Data Warehouse

Trap modem data (public and private)
Trap recovery

Same acoustic modem allows gear to be retrieved by owner only
PROTOTYPES STILL IN EXPERIMENTAL DEVELOPMENT—VERY EXPENSIVE AND NOT PRACTICAL OPERATIONALLY (LONG RESET TIMES) FOR WEST COAST FISHERIES NOT IN CRISIS MODE LIKE ON EAST COAST

<table>
<thead>
<tr>
<th>Units</th>
<th>Cost per unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$18,000</td>
</tr>
<tr>
<td>10</td>
<td>$9,000</td>
</tr>
<tr>
<td>100</td>
<td>$4,500</td>
</tr>
<tr>
<td>1,000</td>
<td>$2,250</td>
</tr>
<tr>
<td>10,000</td>
<td>$1,125</td>
</tr>
<tr>
<td>100,000</td>
<td>$563</td>
</tr>
<tr>
<td>1,000,000</td>
<td>$281</td>
</tr>
</tbody>
</table>

Who pays for this?

If government signals there will be a market for rope-less, manufacturers with venture capital may help to subsidize costs.

If not, this will need to be funded by government or private foundations.

Estimate $3000 total per trap modem, release, and equipment to move the gear from the sea floor to the sea surface. For a fisherman fishing 40 trawls with devices on both ends of the trawl, this means $240K per fisherman. For 15 fishermen, this is $3.6M per fishery.
But Need To Act Here Too...
The ropeless gear information got California fishermen thinking...

• What if the buoy/line was just to mark the location, not to pull the gear? (weak line)

• Timed galvanic releases –
  • Buoys/line come to surface in 1, 3, 5 days etc. (Buoys would have to be the hard buoys used on trawls—different sizes, number to get lift).

• What about pelican hooks or salmon downriggers- where weak line is just used to release the stronger line/buoys? Manila line that doesn’t stretch.

• What about only the first 10 fathoms being the weak line, with additional break-away or degrading swivel – pull first 10 fathoms slowly than like normal?

• What about a telescoping trailer line– like a yo-yo... if main buoy submerged, at a certain tension unspools the trailer buoy

• OTHER IDEAS? Need your innovation. Funding available for testing.

Fran Recht, 541-765-2229, franrecht@gmail.com
Other work being done

• Line profiles (with and without swivels)
• Load testing (what is load when gear is being pulled)
• Smart Buoy (to detect motion when whale gets entangled)
• Forensic review of gear in August