Testing Hookpod-minis (results)

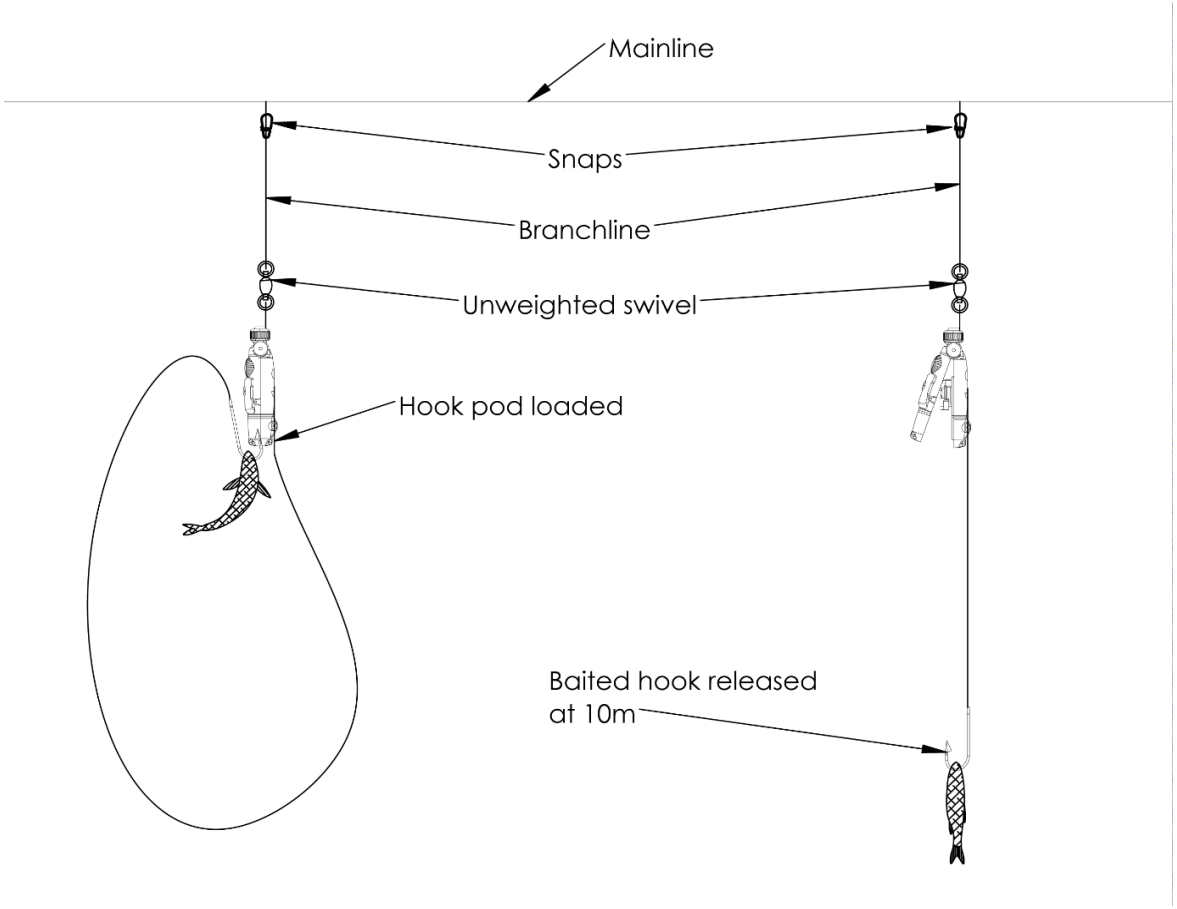
Project objective:

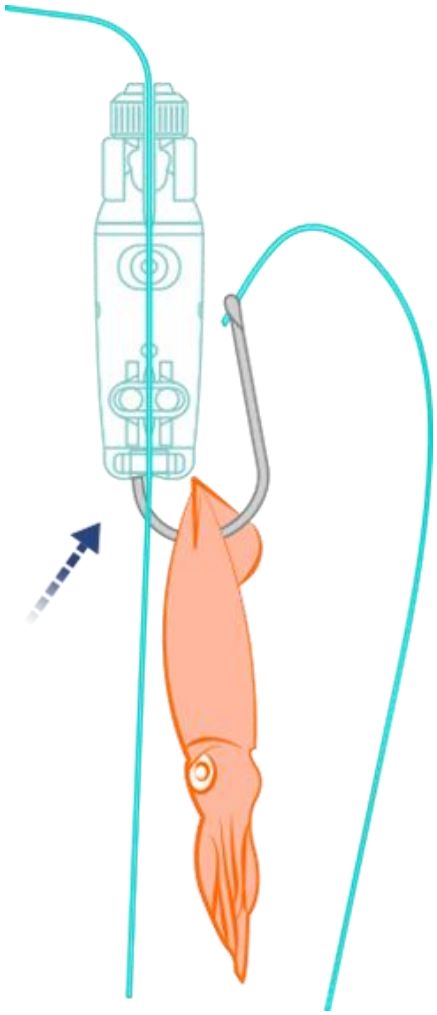
Test the operational effectiveness of hookpod-minis relative to current fishing practices in the New Zealand pelagic longline fishery.

Presentation to CSP Technical Working Group
4661, MIT2015-02 CSP seabird mitigation: small longline vessel trials

Background - hookpod

Hookpod design





Background - the fleet

1 set a day, mostly at night, occasionally pre-dusk.

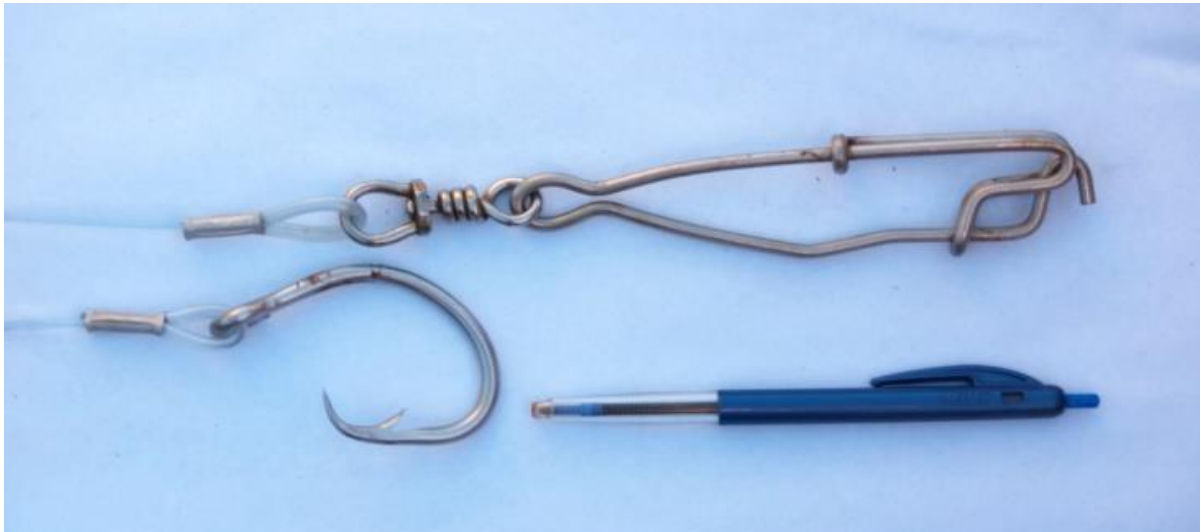
800 - 1200 hooks per day

15 - 30 nautical miles

Floating gear, lots floats, long snoods.

Winter - bluefin target

Summer - bigeye / swordfish



Hookpod-mini opening depth tests

Two separate tests:

Test 1: dropped 100 pods to 10 m and 15 m

Some open after drop to 10 m, all open at 15 m

Test 2: dropped 100 pods to 7 m, 10 m, and 15 m with 3 repeats

All closed after drop to 7 m

Test	7 m			10 m			15 m		
	open once	open twice	open x 3	open once	open twice	open x 3	open once	open twice	open x 3
1	-	-	-	20	-	-	100	-	-
2	0	0	0	18	6	1	99	99	99

Catch comparison methods

Two separate trials, Hookpod-minis on half the gear

Vessel A

- Hookpod-mini vs unweighted gear, both with tori
- Sept 2016
- Bigeye target
- East coast North Island

Vessel B

- Hookpod-mini (no tori) vs 60 g sliding GloLeads (tori most sets)
- 60 – 30% GloLeads luminous
- July 2017
- Bluefin target
- West coast South Island

Catch comparison – raw data

		Vessel A		Vessel B	
		minipods	unweighted	minipods	glo leads
Number of snoods		2882	3274	4982	5462
Number of fish:	albacore	14	16	2	7
	bigeye	19	15	0	0
	southern bluefin	10	7	214	192
	northern bluefin	2	0	0	0
	yellowfin	1	0	0	0
	swordfish	3	3	1	3
	blue shark	64	73	102	142
	porbeagle shark	3	3	21	23
	mako shark	5	6	1	4
	unidentified	1	4	1	3
Bycatch numbers:	fur seal	0	0	2	4
	white-capped albatross	0	0	1	1

Catch comparison statistical analysis

Numbers of tuna similar, but lower numbers of blue shark in hook pod treatments.

But lots of variation between sets and between treatments

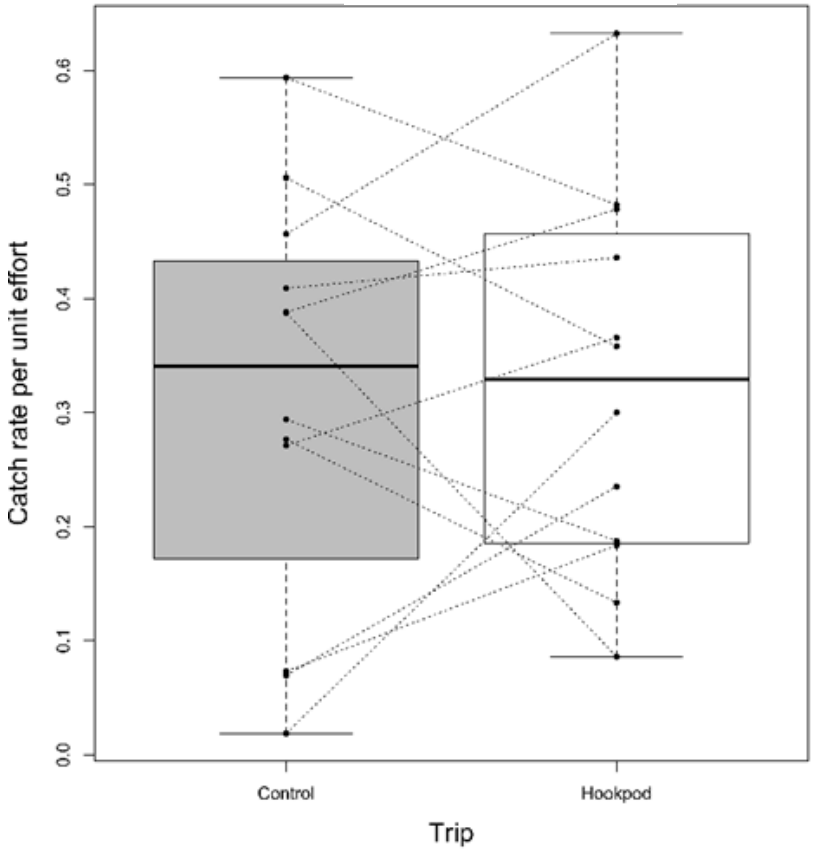
Paired t-tests conducted for each vessel separately resulted in no significant difference between catch rates of:

- Tuna, or
- Blue shark, or
- All sharks

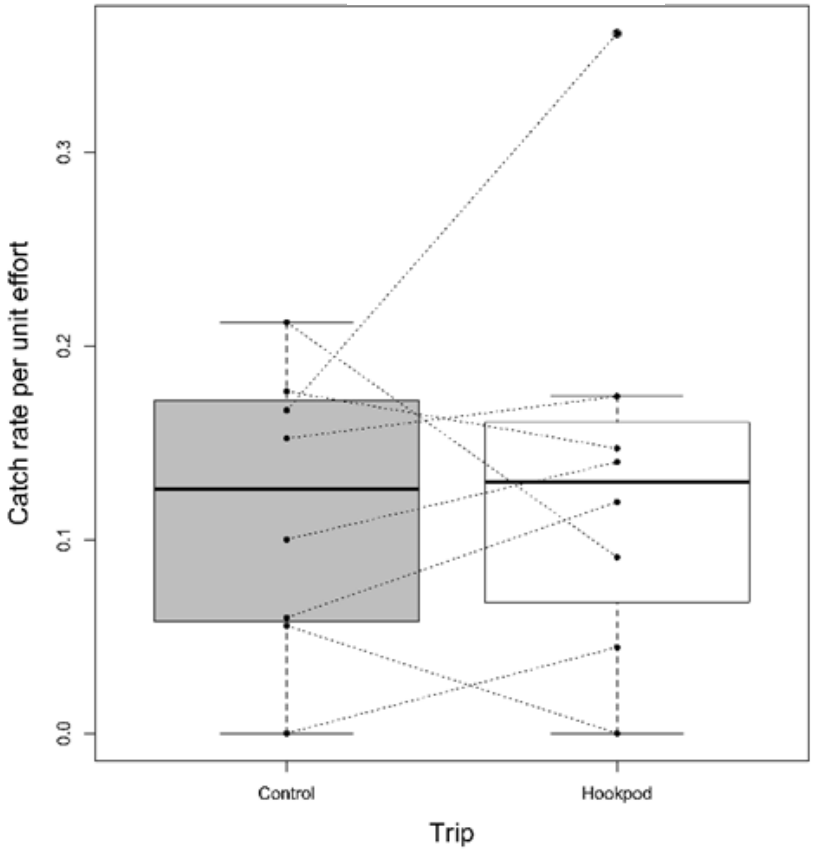
On control and hookpod-mini gear.

Catch rate comparison all tuna

Vessel B

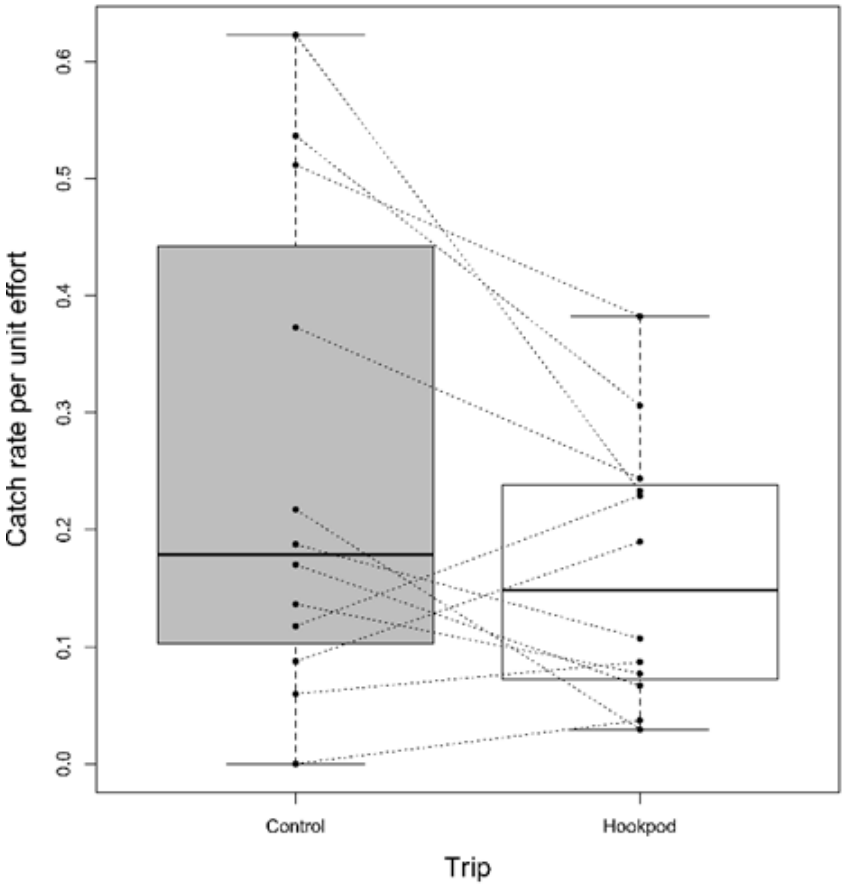


Vessel A

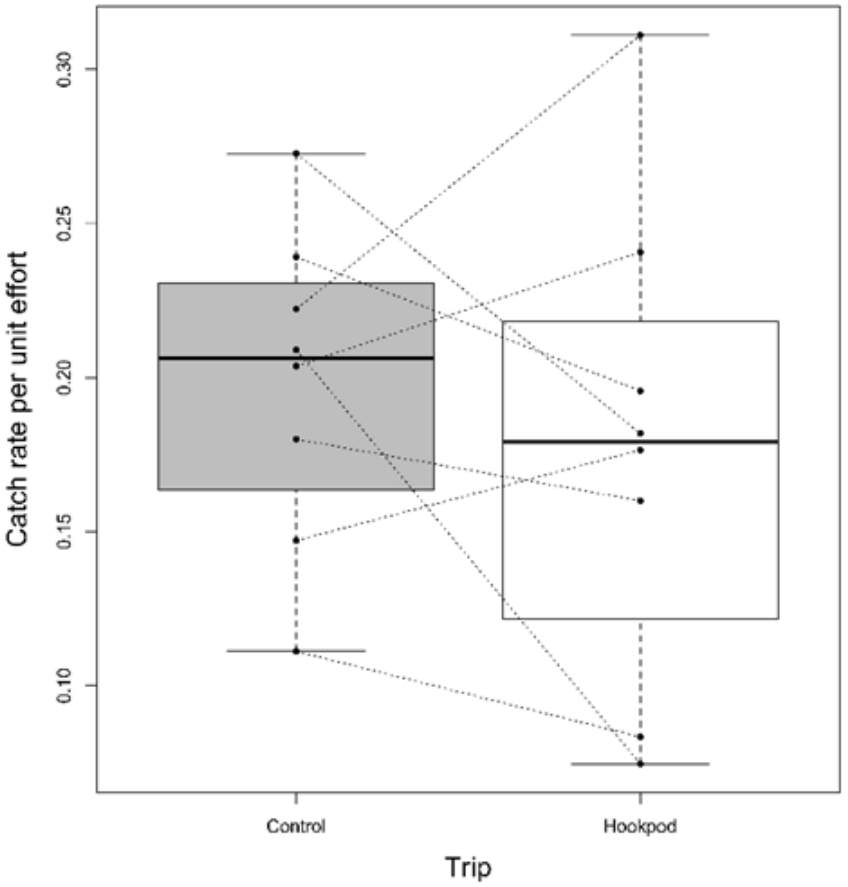


Catch rate comparison blue shark

Vessel B



Vessel A



Long term performance data collection

- Skipper – collected data
- 10 months fishing
- Results could vary between boats / skippers
- Good indication of what is possible
- Skipper is happy working them long term

Long term Hookpod-mini performance

	Totals	Per 1000 deployments
Number of sets	110	
Number of pods set	38152	
Number of control snoods set	52404	
Number of pods not open	147	3.9
Number of pods open but hook not released	14	0.08
Number of pods lost	201	5.3
Number of pods damaged	40	0.86
Dead birds returned on hook pod gear	**3**	**0.079**
Dead birds returned on normal gear	**13**	**0.248**

Operational characteristics

Not slowing down setting operation

Slightly more potential for tangles but hard to quantify and still workable

If they are in the gear they will get used

More incentive to recover pods than weights (cost)

Flexibility for skippers

- Distance from hook
- Can add lights / lightsticks separately

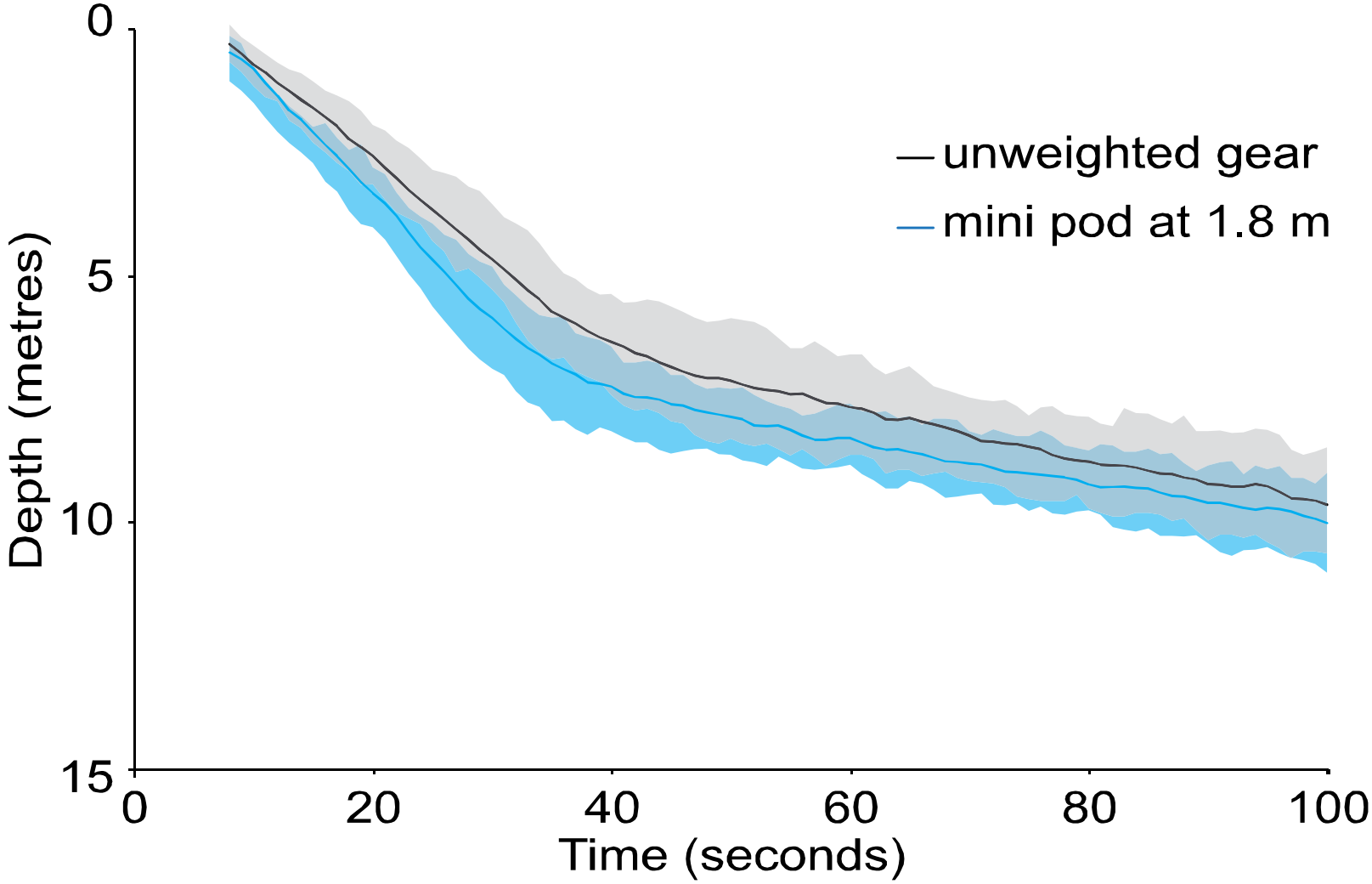
Depends on skipper’s attitude and style of fishing

Fly backs were recorded for pods and weighted gear.

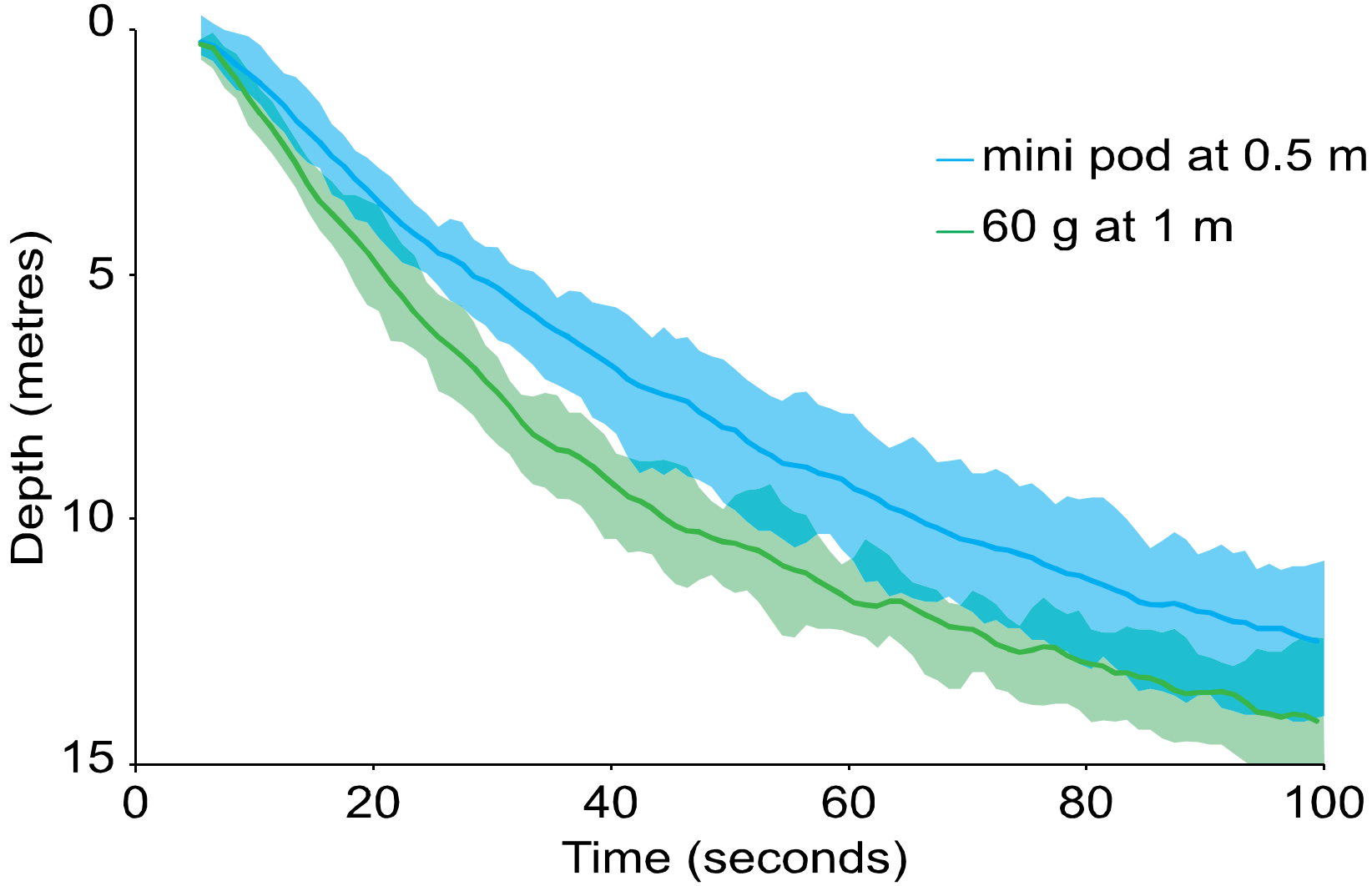
Sink rate data

- Separate snoods (13 m)
- Deployed during normal fishing sets
- TDRs 0.5 m from hook
- Baited hooks (squid)
- Not an absolute measure of true sink rate, but an unbiased comparison
- ‘Traditional’ measure: hook protection depends on sink rate, speed and tori line length (assumes tori deployed and effective)
- Not so relevant for pods as hook is protected to depth

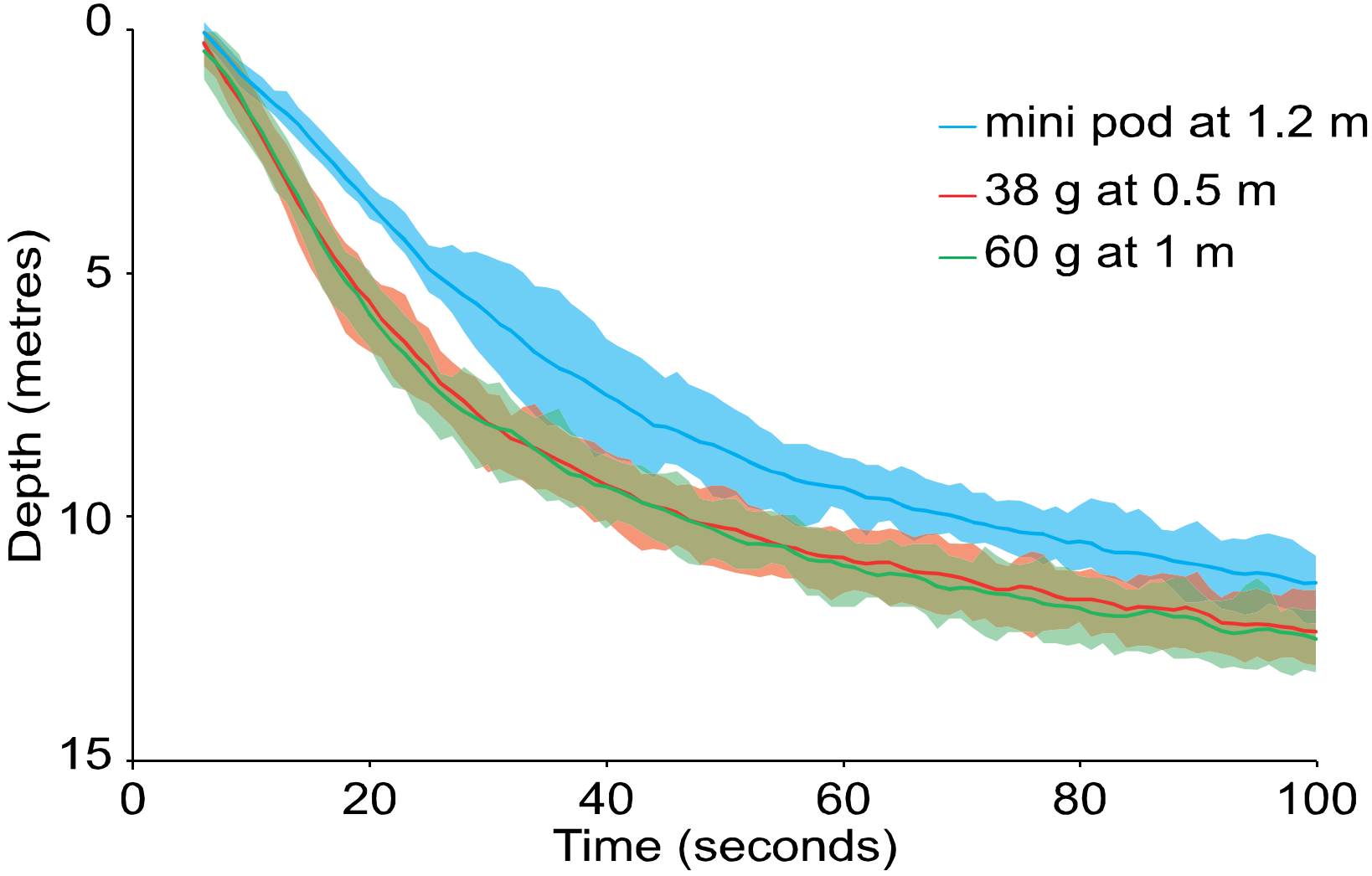
Hookpod-mini vs unweighted gear, vessel A



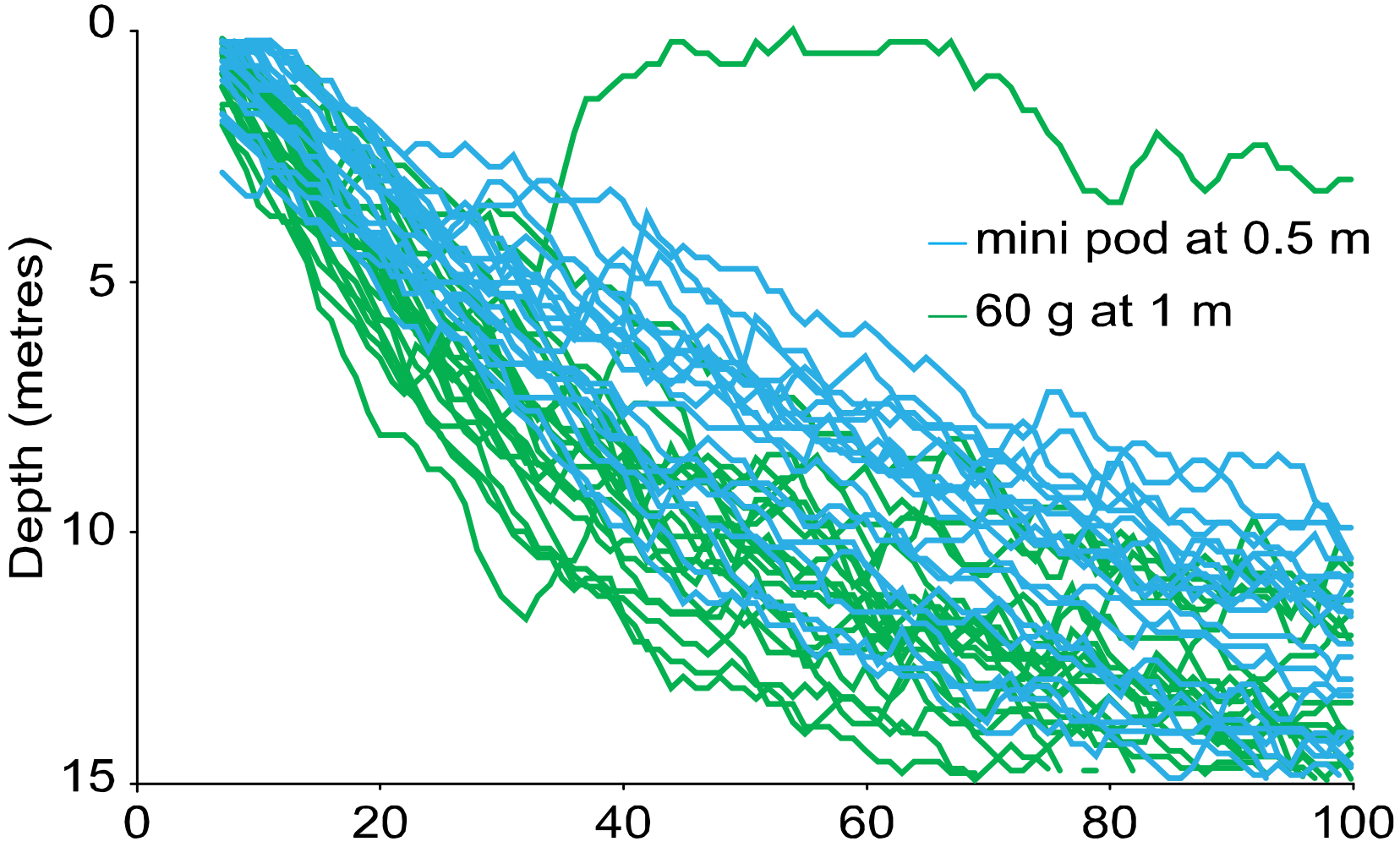
Hookpod-mini vs 60 g at 1 m, vessel B



Hookpod-mini vs 38g at 0.5 m vs 60 g at 1 m, vessel C



Lots of variation (vessel B)



Tabulated sink rate data

			mean time / depth (+/- SE)				
vessel	speed	treatment	time to 2 m (s)	time to 5 m (s)	time to 10 m (s)	depth at 75 m astern (m)	depth at 100 m astern (m)
A	5.5 - 6.5	mini pod	15 (11 - 20)	28 (21 - 34)	126 (60 - 193)	4.4 (5.7 - 3.1)	6.4 (7.9 - 5.0)
A	5.5 - 6.5	unweighted	18 (13 - 22)	36 (24 - 48)	127 (66 - 188)	3.4 (4.6 - 2.2)	5.2 (6.8 - 3.6)
B	7.3	mini pod	15 (11 - 19)	32 (24 - 40)	71 (51 - 91)	3.3 (2.4 - 4.2)	4.6 (3.6 - 5.7)
B	7.3	60 g at 1 m	13 (10 - 16)	22 (17 - 28)	52 (33 - 71)	4.6 (3.2 - 6.1)	6.6 (5.2 - 8)
C	6.5	mini pod	15 (12 - 17)	28 (21 - 34)	72 (52 - 93)	4.3 (3.3 - 5.3)	5.8 (4.3 - 7.3)
C	6.5	38 g at 0.5 m	11 (8 - 14)	19 (14 - 24)	52 (26 - 78)	6.4 (5.0 - 7.8)	8.0 (6.3 - 9.7)
C	6.5	60 g at 1 m	11 (9 - 13)	19 (15 - 24)	48 (35 - 62)	6.6 (5.1 - 8.1)	8.1 (6.5 - 9.6)

Next steps

Feedback please

Final write up

Continue long term data collection

Acknowledgements

Owners, skippers and crew

Jo Potts (statistician)

DOC CSP and MPI (special permit)

Funding through levy on relevant fish stocks (STN SWO BIG)