Literature notes:

Bradley et al. 2019

* Talk about how data collection, storing and analysis systems are largely absent from all fisheries – commercial, recreational and artisanal
  + Gulf red snapper (with commercial and recreational fisheries) were overfished for 6 years because NMFS hadn’t analyzed the recreational fisheries data in a timely way
* Talk about electronic monitoring is used such as VMS and shore cameras
* Four challenges in technology uptake:
  + Upfront costs
  + Bureaucratic hurdles
  + Failure to implement dat standards
  + Lack of trust from fishers
* They provide suggested steps for adoption
* Several systems exist to identify and measure fish, as well as other uses of AI
  + While some of these systems are integrated in data rich fisheries, they are ararely, if ever integrated into data poor fisheries such as small-scale fisheries, recreational or artisanal fisheries

Brick et al. 2022

* There are lots of data coming in; some are probablistically sampled (MRIP), others not (organic data from cell towers – harvesting ore-existing data)
* Provide equation MRIP uses to calculate fishing effort: p.fishing x effort per trip [all from phone interviews] x total population [known]
* bias comes from nonresponse of anglers in p
* Apps use diff equation: n.fishing x effort per trip; don’t know n.fishing because not all people report all trips
* Can’t correct because you don’t know true number of anglers (because some are unlicensed)
* No papers suggest you use apps to estimate effort
* Self-selection bias is also a problem - where anglers only respond after successful trips
* You could use apps to measure length of discards (Jiorle), angler movement (Papenfuss), or surveys (Venturelli)
  + For each, use the equations shown to calculate bias through sensitivity analysis
  + These data could also be used to evaluate hypotheses that could later be tested using probabilistic sampling
* Getting occasional anglers to use an app seems unattainable
* Using apps for catch rates instead of effort is possible because it is a mean rather than total
  + But, need to ensure anglers install and keep using app – unlikely
* Bad biased data isn’t necessarily better than no data at all

Gundelund and Skov 2021

* Looked at catch and effort trends of Danish app users during COVID
* Younger, inexperienced, and different daily effort patterns

Gundelund et al. 2020

* Compared users of Danish angler app with anglers intercepted in roving creel
* Users were younger, more specialized and had higher catch rates
* Those who kept using the app over time were older and pht higher importance on fishing than those who dropped out

Gutowsky et al 2013

* Talk about how smartphones and tablets make research and monitoring easier

Jiorle et al. 2016

* Compared IAngler and MRIP data for shore and private boats fishing along Florida coast
* Some species had reasonable (>30) sample size to make comparisons within particular counties
* Spatial bias exists, so can’t be used at state-wide level
* Catch rates were comparable at state-wide level
* Can’t be used for stock assessment, but could fill in gaps in information, such as with discards
  + Information on captured fish (lengths) can’t be captured from post-trip surveys like MRIP
  + \*\*it is even an improvement on creel surveys because you get info on released fish
  + Smartphones are also better able to collect data from spatially diffuse fisheries

Johnston et al. 2022

Meyer et al. 2022

* 2018 German Baltic small scale fishery was obligated to use an app during cod time-area closures
  + Small-scale fishers include trawlers and gill effete with boats <12m
* Much of the paper is about the problems of implementing mandatory electronic reporting (like a logbook but on a phone)
* Found statistics for commercial fishers were generally insistent with other modes
* They had app monitor location every minute and found this helped determine exact trawling and gill net location which could identify changes in spatial allocation of effort over time

Midway et al. 2020

* Look at GoM snapper angler’s willingness to electronically report their trips
* Found >80% are willing to electronically report, yet only 1% actually do
* Strong perception among anglers that apps would help
* In monitoring anglers fishing from private docks

Papenfus et al. 2015

* Quantifying angler behaviour is important for management and invasive species control
* Conventional methods (creel, surveys) try to estimate retrospective patterns that are limited in time and space and suggest intentions or attitudes rather than revealed preference (Adamowicz et al. 1994)
* Angler apps are like volunteer diaries, and also provide fine-scale movement data
* Captured open water and ice fishing seasons
* Identified anglers who fished two or more times per week and showed these were typically less than 150 km apart
* Estimates relative popularity of lakes, but underestimates by >259 lX
* Strong sampling bias results in some areas over it underrepresented in data. For eg, angling seems lower around Calgary, but this may be due to rivers not included in the app
* There is also transiency (people not using the app for long) and avidity bias.

Silva et al. 2022

* Talk about how image recognition can help extract length and species information to help inform management

Skov et al. 2021

* App users are self-selecting (Gundelund et al 2020); also likely underreport small or non-target catch (declaration bias) or non-catch trips
* Surveyed representatives from many countries-mostly Europe to see their knowledge and interest in app data
* Respondents consider use of fishing apps to be in its infancy
* Optimism for using app data was higher among those from data poor countries and managers rather than researchers

Teacher et al. 2013

* Smartphones have gps, microphones, accelerometers and can read QR codes and take pics/videos
* Generally talks about tips tricks and mistakes made when developing an app for collecting citizen science information

Venturelli et al. 2017

* They present state of the art, challenges and suggest standards to help reduce or address challenges
* Apps can receive info from anglers and educate anglers to make them more engaged, potentially leading to democratization of anglers
* Can also collect ancillary info like size, sex, maturity and tag numbers
* Suggest three grand challenges: recruitment and retention, data quality, integration)
  + R &R is relevant to all apps and citizen science
    - More likely when participants perceive advantage, when it’s simple and when they can trial or see other people use it