#SharkRaySA Day 2

Tweets and photos from the second day of the Southern African Shark and Ray Symposium, held from 7-9 September 2015 in Cape Town.

Up on the #mountain again today for day two of the 2015 Southern African #Shark & #Ray #Symposium. Follow the #SharkRaySA hashtag on twitter for live tweets from the event. Looking forward to presentations by @aseeqahdavids, @sharkspotters, and others! #nofilter #SimonsTown #sunrise #CapeTown #science #scicomm #morning #conferencing #conference

Day 2 of #SharkRaySA starts in about an hour. Here’s the day’s program. Keep up with the shark & ray science here! pic.twitter.com/VsqrZ8arNC

https://storify.com/learn2divetoday/sharkraysa-day-2.html
You can find the abstracts for all the #SharkRaySA talks at sharkandraysymposium.wordpress.com/abstracts/

First up a keynote from Dr Paul Cowley of SAIAB "ATAP – enhancing opportunities to explore marine animal movement behaviour" #SharkRaySA

#SharkRaySA Cowley: is funded by @saveourseas and @ACEP_ZA

Paul Cowley delivers keynote address on Day 2 of #SharkRaySA: movement of marine animals using acoustic telemetry pic.twitter.com/Fn5GlgYEmv
#SharkRaySA Cowley: 1st tagging study in SA was 1934, initiated by govt sea fisheries institute. Even tagged pilchards!

#SharkRaySA Cowley: 1st shark tagging study 1964, over 1000 sharks tagged, recapture rate of 27%!

#SharkRaySA - 1st fish tagging in SA was in 1934, 1st sharks in 1964. Raggie tagged in Durban in 1964, recap 22 years later in mossel bay!

#SharkRaySA Cowley: Oceanographic Institute has tagged nearly 300,000 fish (80,000 elasmobranchs)

#SharkRaySA Cowley: we have a good history of acoustic telemetry in South Africa

#SharkRaySA Cowley: good reason for all the interest in fish tagging in SA - Agulhas & Benguela currents allow great biodiversity here

#SharkRaySA Cowley: we have >250 estuaries along our coast, mixed habitats
#SharkRaySA Cowley: SA’s coast also host to numerous fisheries and “the greatest shoal on earth” (sardine run) - much movement of fishes

3 YEARS AGO

#SharkRaySA Cowley: what is ATAP and how can it enhance our understanding of fish movements around SA coast?

3 YEARS AGO

More information on ATAP (acoustic tracking array program): goo.gl/Hpka2v & goo.gl/vG8kWo

#SharkRaySA

3 YEARS AGO

#SharkRaySA Cowley: there is an array of acoustic listening devices around SA coast. Tags communicate with these devices

3 YEARS AGO
#SharkRaySA here's what an acoustic listening device looks like (out of water)
pic.twitter.com/JePgfrGvIC

@SHARKandRAY2015

SharkandRay2015

#SharkRaySA Cowley: receivers are lifted & cleaned every 7 months to minimise fatigue, biofouling, wear on the metal chains securing them
#SharkRaySA - SA part of global tracking network, the Ocean Tracking Network. 100 receivers currently along SA coastline pic.twitter.com/0nNmQTkaQN

Shark Ray 2015
@SHARKSPOTTERS - 3 YEARS AGO

#SharkRaySA Cowley: ATAP is part of a global network called @OceanTracking

EleanorYeldHutchings
@Eleanor_YH

#sharkraysa Cowley: Acoustic tracking array pattern has over 100 listening stations! Amazing network complemented by private receivers too

Shark and Ray 2015
@SHARKandRAY2015

#SharkRaySA Cowley: there are now >100 permanent deployment sites. Not much room for expansion due to $$ & human resources restrictions

Shark Ray 2015
@SHARKandRAY2015

3 YEARS AGO
Cowley: tagged >500 animals; shark species include GWS, raggies, Zambezi, seven gills, reef mantas, threshers

Cowley: also 3x penguins, and teleosts include dusky kob, leervis grunter, white steenbras, potato bass, green jobfish

Cowley: have >70 tags that have been tracked for >10 years

Cowley: can learn about hotspots, philopatry (returning to place of birth to breed), seasonality & trans boundary movements

Cowley: a lot of the data collected will enable us to interrogate effects of climate change in years to come

Cowley: the @OCEARCH satellite tags are dead but acoustic tags in the same sharks allow us to update movements of those sharks

Cowley: trans boundary movements of GWS (from SA into Mozambican waters) a huge conservation concern
#SharkRaySA Cowley: Zambezi shark tagged by @KznSharks in Durban moved between Port Alfred & Mozambique 4x in 2 years!

3 YEARS AGO

Zambezi shark is another name for bull shark (*Carcharhinus leucas*)

#SharkRaySA - White sharks easily travel from False Bay to Mozam & back. This pic shows the movements of a Zambezi shark pic.twitter.com/IVkhsbBhDa

3 YEARS AGO

#sharkraysa Cowley: bull sharks show periods of extended residency periods, rapid longshore movements - also transboundary concerns.

3 YEARS AGO

#sharkraysa Cowley: juvenile bull sharks resident in estuaries for +-4 years, then start adopting adult movement patterns

3 YEARS AGO
Cowley: tiger sharks tagged in Reunion in Aug 2013 - two came across to SA, detected around Mozambique border and south

Cowley: ATAP enables comparison of behaviour of captive animals released from aquaria with free-swimming counterparts

Cowley: vulnerability of fisheries is shown by 21 Leervis tagged in Kowie estuary, of which there has been a 33% mortality rate

Cowley: one leervis was caught 4x, recaptured 3x, tagged twice (dart & acoustic)... never had a chance to spawn

Cowley: great data collected, strong global links, active tagging community, sufficient infrastructure for the short term

ATAP program is functioning well. The time for tagging is NOW. Array can track most marine species, including diving sea birds. #SharkRaySA
#SharkRaySA (audience Q to Cowley) any plans to move up the west coast of SA or to expand to penguins & other species?

#SharkRaySA Cowley: manpower to maintain W coast receivers is lacking - not too much interest from or numbers of researchers in that area

#SharkRaySA Cowley: SA’s west coast is seeing climate change effects, fish movements down from Namibia - time is ripe to expand to that area

#SharkRaySA Cowley: one acoustic tag costs (at current exchange rates) over ZAR 4,000... but for 10 yrs of data, it’s not expensive

Next #SharkRaySA talk is Ryan Daly @pontasharkdiaries of @BayworldPE “Refuges & risks: are tiger sharks safe within the SW Indian Ocean?”

Ryan Daly’s twitter handle should read @PontaSharks

#SharkRaySA Dr Malcolm Smale, Daly’s collaborator will deliver his talk
#SharkRaySA Smale: tiger sharks are apex predators, range over huge areas, classified as near threatened (IUCN)

C. da Silva
@mmustelus

#SharkRaySA Smale: Tiger sharks are near threatened, and potentially under threat from a number of fisheries

#SharkRaySA Smale: tiger sharks born at 50-90cm, litter size 30-60 pups. Gestation period 13-16 months. Little known other than basics!

#SharkRaySA Smale: male tiger shark size at maturity 2.9-3.5m, females 2.9-31.m. They may live to 45-50 yrs

#SharkRaySA Smale: @KznSharks mean annual catch of 49 animals. As Dicken indicated yesterday, size of captured animals increasing over time

#SharkRaySA Smale: need to investigate tiger shark movements in the SW Indian ocean

#SharkRaySA Smale: acoustic tags were used; tigers are easy to tag (relax when captured)
#SharkRaySA Smale: preliminary work - tagged tiger sharks with two types of tag

#SharkRaySA Smale: size range of study animals is 3.2-3.3m total length. All sharks remained in SW Indian Ocean.

#SharkRaySA Smale: animals moved south to Port St Johns, to Inhaca in the north (Mozambique)

#SharkRaySA Smale: the tagged animals exhibited residency within @iSimangaliso_ZA and Ponta do Ouro Partial Marine Reserve

The twitter handle for iSimangaliso should read @iSimangalisoZA (oops!)

#SharkRaySA Smale: risks to sharks include nets of @KznSharks & fishing activity along SA coast. Offshore/ IUU fisheries of most concern

#SharkRaySA Smale: tiger sharks move extensively across SA-Moz border. Protection within @iSimangalisoZA high, less so in Moz
Malcolm Smale: tiger sharks are clearly making transboundary movements between Moz and RSA, navigating risks on the way #SharkRaySA

C.da Silva: Smale: Conclusion- align transboundary protection for tiger sharks.

SharkandRay2015: Smale: what next? Study population genetics, ecological role, and more!

Next up is Dylan Irion of Oceans Research talking about great white sharks (GWS) #SharkRaySA
#SharkRaySA - Dylan Irion: Movement-based behavioural patterns of white sharks, from active acoustic telemetry data [pic.twitter.com/oCpODKL2VT](https://storify.com/learn2divetoday/sharkraysa-day-2.html)
#SharkRaySA Irion: movement a response to many things – environmental factors, internal state of animal

#SharkRaySA Irion: movement data from GWS is "gappy" - need to find model to accommodate this

#SharkRaySA Irion: tracked 6 sharks for several hundred hours

#SharkRaySA Irion: measured persistence velocity & turning velocity of the sharks...

#SharkRaySA Irion: statistical properties of these measurements enable us to describe the possible type of motion the shark is doing

#SharkRaySA Irion: examined movement data in conjunction with wind speed, tide, time of day, area in use

#SharkRaySA Irion: analysed different size classes of sharks separately (juveniles & adults may behave differently)
#SharkRaySA - White sharks less than 3.4m generally eat fish and smaller sharks, over 3.4m generally eat seals and other pinnipeds

#SharkRaySA  Irion: we were able to identify several phases of the sharks’ movement

#SharkRaySA  Irion: these phases of behaviour included foraging for fish, foraging for seals, scavenging around fishing boats, travelling

#SharkRaySA  Irion: one class of movement appeared to be associated with chumming vessels - an “unnatural” behaviour

#SharkRaySA  Irion: transitions between different types of behaviours were also examined

#SharkRaySA  Irion: island-related and reef-related behaviours were separated by travel behaviour - a neat result

Next up Dr Alison Kock @UrbanEdgeSharks of @SharkSpotters “Size & sex-specific spatiotemporal patterns of GWS at Seal Island” #SharkRaySA
#SharkRaySA - Alison Kock - Size and sex-specific spatiotemporal patterns of white sharks @ Seal Island, False Bay, SA pic.twitter.com/tsmfuoV8c3

@SHARKSPOTTERS - 3 YEARS AGO

#SharkRaySA Kock: at Seal Island in #FalseBay there is a specific pattern of predatory attacks by GWS on Cape fur seals

@SHARKandRAY2015 - 3 YEARS AGO
#SharkRaySA Seal Island in False Bay - home to between 30,000 & 70,000 Cape fur seals
pic.twitter.com/BMFXmFkSz5

Shark Spotters
@SharkSpotters

#SharkRaySA-White sharks most successful at hunting seals just after sunrise, seals find it harder to see the sharks in low light conditions

3 YEARS AGO

SharkandRay2015
@SHARKandRAY2015

#SharkRaySA Kock: highest success rate by GWS is first two hours after sunrise - using low light for ambush

3 YEARS AGO

Lisa Boonzaier
@lisaboonzaier

Alison Kock: at Seal Island, white sharks concentrate their predatory attacks on the south and south-western side of the island #SharkRaySA

3 YEARS AGO
Alison Kock: sharks are not behaving 'randomly' at Seal Island, but do smaller and larger or M and F sharks behave differently? #SharkRaySA

EleanorYeldHutchings
@Eleanor_YH

#sharkraysa Kock: do all GWS size groups follow same patterns using Seal Island? How about males & females? Does chumming have impact?

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#SharkRaySA Kock: seal movement is concentrated on the southern edge of the island

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@SHARKandRAY2015

#SharkRaySA Kock: sharks patrol the southern side of the island around sunrise

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@SHARKandRAY2015

#SharkRaySA Kock: research questions = are all GWS behaving in the same way? Do smaller GWS know the prime areas/times for hunting?

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@SHARKandRAY2015

#SharkRaySA Kock: could larger sharks out-compete the small sharks? Do males & females use the island similarly?

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@SHARKandRAY2015

#SharkRaySA Kock: does chumming (by research vessels & cage diving boats) impact GWS behaviour at Seal Island?
#SharkRaySA Kock: used acoustic telemetry – receivers situated around Seal Island

3 YEARS AGO

#SharkRaySA - Location of acoustic receivers around seal island, False Bay, to track shark movements @UrbanEdgeSharks pic.twitter.com/hAgHiSNpWS

3 YEARS AGO

#SharkRaySA Kock: tagged sharks ranging in size from 2-5 metres, receivers deployed for 12 months at a time

3 YEARS AGO

Alison Kock: monitored 68 sharks for 1349 days #SharkRaySA

3 YEARS AGO
Kock: estimated size (hard to do) in 0.5 metre bins – split sharks into 3m & smaller, greater than 3m length

Kock: residency on the daily presence of sharks not statistically different for small and large sharks or females and males.

Kock: both sexes spent similar amounts of time at Seal Island

Kock: sharks concentrated around the island in Autumn and Winter.

Kock: used data from autumn & winter to eliminate seasonal effect of sharks moving inshore during summer

Kock: used a model to investigate variables impacting the proportion of sharks at the north & south of Seal Island

Kock: size and chumming did not affect the location of the sharks in the north or south of the island
Kock: this left the sex of the shark and the time of day as determinants of the sharks' location around Seal Island

C.da Silva
@mmustelus

Kock: chumming had no effect on hunting behavior due to lack of reward to maintain energetic costs of hunting.

Pippa Ehrlich
@PippaEhrlich

Alison Kock: At around 3 meter size white sharks' start to eat marine mammals. How do bigger vs smaller sharks use seal island? #SharkRaySA

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Kock: all sharks regardless of their size prefer to be south of Seal Island at sunrise

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Kock: males spent 80% of time on the south side, females 60% - different dietary importance of seals/energy requirement?

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@mmustelus

Kock: future research will use active tracking and critter cams to investigate hunting behavior of white sharks

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Kock: future work - use critter cams to identify social interactions & other behaviours
Camera technology is changing the game for biologists. What will crittercams show us about great whites’ social interactions? #SharkRaySA

For more info on Alison Kock’s activities with white sharks: saveourseas.com/project/white-... follow @UrbanEdgeSharks @SharkSpotters #sharkraySA

After tea, 1st up Enrico Gennari of Oceans Research on “The Story of a Small Town with a Big Acoustic Array: Mossel Bay” #SharkRaySA

#SharkRaySA - Enrico Gennari - a small town with a big acoustic array, Mossel Bay
pic.twitter.com/0Ol7h5Wejn
Gennari: the good old days researching sharks in Mossel Bay - one man, one species!

Gennari: acoustic receivers are very expensive relative to the cost of the tags

here's another picture of some acoustic listening devices, retrieved from their positions on the seabed pic.twitter.com/5Q3RDrznTe

Gennari: tag/receiver ratio in Mossel Bay used to be very low (2 tags per receiver in 2004)
SHARKandRAY2015

#SharkRaySA Gennari: advent of ATAP and @OceanTracking enabled multi-study, multi-year, multi-species collaborative work

3 YEARS AGO

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#SharkRaySA Gennari: we can answer local questions on top of regional ones, share resources & workload, retrieve receivers more frequently

3 YEARS AGO

SHARKandRAY2015

#SharkRaySA Gennari: the cons of this approach are similar to the pros! More listening power = more data to analyse!

3 YEARS AGO

SHARKandRAY2015

#SharkRaySA Gennari: by leveraging the incredible marine biodiversity we can attract global collaborators

3 YEARS AGO

SHARKandRAY2015

#SharkRaySA Gennari: example project (with SAIAB) studying trophic ecology of catsharks, their reef use in Mossel Bay

3 YEARS AGO

SHARKandRAY2015

#SharkRaySA Gennari: projects undertaken with @Dalnews, @SussexUni, @aberdeenuni, @UPTuks - massive collaboration potential

3 YEARS AGO
#SharkRaySA Gennari: array has also enabled collaborations with @Rhodes_Uni, @NMMU4U and more

#SharkRaySA Gennari: the most effective “shark repellent” doesn’t target sharks, but humans!

#SharkRaySA Gennari: could we interrogate the data to model GWS habitat utilisation, and determine when/why overlap w/ humans happens?

Similar work has been done in False Bay (minus the app) - check out sharkspotters.org.za/shark-...

#SharkRaySA Gennari: this approach could provide info to water users regarding chance of encountering a shark

#SharkRaySA Gennari: an app drawing on this data could provide a probability of shark presence based on time of day, location

#SharkRaySA Gennari: the app is a long-term project, has confidence in the possibility

#SharkRaySA Gennari: future work - more tags, more sharing, more funding!
Enrico: We need more tags #SharkRaySA pic.twitter.com/FkqEn48Shh

@KERRYMOSS1 · 3 YEARS AGO

C.da Silva
@mmustelus

#SharkRaySA- nice one Gennari! Sneaking a LOTR reference in. We all wants the precious 😊

3 YEARS AGO

Whalefish
@Whalefish_org

#SharkRaySA Enrico Gennari: we need to worry less about sharing data! Wise words!

3 YEARS AGO

C.da Silva
@mmustelus

#SharkRaySA Gennari: collaboration is important for sharks.

3 YEARS AGO
The next #SharkRaySA talk is Tamlyn Engelbrecht of @UCT_Research with preliminary results from a long-term cooperative fish tagging project.

First insights into movement ecology of another charismatic apex predator, the sevengill cowshark #SharkRaySA pic.twitter.com/EBmM1YEJnR

Engelbrecht: “Preliminary insights into the movement patterns of broadnose sevengill sharks caught along the SA coastline” #SharkRaySA
#SharkRaySA wonder what a broadnose sevengill cowshark looks like? Here’s one. Spot the tag! pic.twitter.com/e1bn3PoUxQ

@SHARKandRAY2015 3 YEARS AGO

#SharkRaySA Engelbrecht: 7gills are widely distributed (inshore areas), prey on a wide range of species

@SHARKandRAY2015 3 YEARS AGO

#SharkRaySA Engelbrecht: 7gills are often taken as bycatch & are subject to intensive fishing pressure

@SHARKandRAY2015 3 YEARS AGO

#SharkRaySA Engelbrecht: broad nosed sevengill cow sharks not a commercially valuable species

@mmustelus 3 YEARS AGO
Engelbrecht: my project focuses on the spatio-temporal dynamics of 7gills

Engelbrecht: used data from the ORI Co-operative Fish Tagging Project

Engelbrecht: aim of ORI tagging project is to gain insight for management of line fish species in SA

Engelbrecht: limitations - effort & sex not recorded, errors in data (e.g. capture length > re-capture length)

Engelbrecht: limitations - only receive 2 data points (locations of capture & recapture of animal)

Engelbrecht: benefits - cost effective, wide-ranging, lots of data

Engelbrecht: 7gills range from Cape Fria in Namibia to Kei River Mouth in SA’s E Cape
Engelbrecht: catches of 7gills concentrated on south & east coast of SA. Less fishing pressure? Less effort? Hard to know.

Engelbrecht: 2185 7gills tagged since 1984, recapture rate 5.2% (relatively low)

Engelbrecht: 36.5% of recaptured 7gills were recaptured in same location as original capture despite long periods at liberty

Engelbrecht: are the 7gills displaying seasonal site fidelity? residence in these areas?

Engelbrecht: 70% of 7gill recaptures were within 50km of original capture site

Engelbrecht: nearly 10% of recaptured 7gills were caught >300km from initial tagging site - greatest distance = >600km

Shark Spotters - one cowshark caught 650km from initial capture site; still a lot to learn on where they go and why they go there!
Engelbrecht: Broadnose 7gill show evidence of broad coastal migrations #SharkRaySA
pic.twitter.com/4S5OrCxkW2

3 YEARS AGO

@KERRYMOSS1

ENGELBRECHT: Data provides preliminary insight into movements & presence of 7gill sharks in SA

3 YEARS AGO

The next #SharkRaySA speaker is Leigh de Necker @_sharky_77 also of @ UCT_Research also on broadnose sevengill cowsharks

3 YEARS AGO
#SharkRaySA - Leigh de Necker - using stable isotopes to identify the trophic ecology of cowsharks in False Bay pic.twitter.com/9cFincwhd9

De Necker: “Preliminary insights using stable isotopes of the trophic ecology of broadnose sevengill sharks in False Bay, SA” #SharkRaySA

#SharkRaySA de Necker: 7gills are apex predators that aggregate seasonally in coastal habitats
#SharkRaySA another broadnose sevengill cowshark, because they’re beautiful! pic.twitter.com/v8jKZfF7bh

@SHARKandRAY2015 · 3 YEARS AGO

#SharkRaySA de Necker: stomach contents studies indicate other shark & ray species make up primary part of 7gill diet

@SHARKandRAY2015 · 3 YEARS AGO

#SharkRaySA de Necker: as size of shark increases, seals become more important/bony fish less important in diet

@SHARKandRAY2015 · 3 YEARS AGO
#SharkRaySA - As the cowsharks get bigger, their diet changes, eat less fish but more smaller sharks and even seals! pic.twitter.com/B93cERgI6T

SHARK SPOTTERS · @SHARKSPOTTERS · 3 YEARS AGO

#SharkRaySA de Necker: stomach contents provides short term snapshots of diet - stable isotope analysis provides more detailed knowledge

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#SharkRaySA de Necker: carbon isotopes indicate foraging location, habitat use

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#SharkRaySA de Necker: aims to use nitrogen, carbon isotope analysis to understand gills in False Bay

SHARKandRAY2015 · @SHARKandRAY2015 · 3 YEARS AGO
#SharkRaySA day 2

de Necker: study site on W edge of False Bay, Castle Rocks marine reserve, at a shallow site where 7gills aggregate

#SharkRaySA
de Necker: measure and tag sharks, muscle biopsy, fin clips & blood samples collected

#SharkRaySA
de Necker: preliminary results based on 32 muscle tissue samples from 7gills

#SharkRaySA
de Necker: prey samples - teleosts from recreational fishers, seals from carcasses, shark & ray samples from processor in strand

De Necker: isotope data nicely complement work done by Ebert 1991

De Necker: isotope analysis complements Ebert’s work - prey split between seals, other sharks & bony fish

De Necker: compared stable isotope values with body size
#SharkRaySA de Necker: decrease in nitrogen, increase in carbon with increasing body size

#SharkRaySA de Necker: evidence of relationship between nitrogen isotope values & body size, although sharks <160cm missing from analysis

#SharkRaySA de Necker: larger female 7gills have higher carbon, lower nitrogen values compared to smaller sharks

#SharkRaySA de Necker: no indication that these sharks had been feeding in offshore regions

#SharkRaySA de Necker: larger sharks spending proportionally more time in regions related to reproductive habits

#SharkRaySA- Large female cowsharks eat differently, mostly smaller inshore sharks, maybe because they spend more time close to shore to breed

#SharkRaySA de Necker: why are the larger 7gills feeding more on lower trophic level prey?
Big female cowsharks eat lower trophic level prey. Likely competing with great white sharks for food. #SharkRaySA pic.twitter.com/8YH6w8hhOn

@SASC3 · 3 YEARS AGO

SharkandRay2015

#SharkRaySA de Necker: could be because 7gills are sharing False Bay with an even larger apex predator... white sharks!

3 YEARS AGO

SharkandRay2015

#SharkRaySA de Necker: GWS in False Bay spend winter at Seal Island, summer inshore... worth investigating partitioning of habitat w/ 7gills

3 YEARS AGO

SharkandRay2015

#SharkRaySA de Necker: future work = sample male 7gills, more prey species (smaller, skates & rays), sample primary producers (plankton etc)

3 YEARS AGO

SharkandRay2015

#SharkRaySA de Necker: future work = use stable isotope analysis in conjunction w/ tagging data

3 YEARS AGO
Sevengill sharks are an understudied False Bay resident: @SharkSpotters student volunteers taking this on #SharkRaySA pic.twitter.com/028DFLAPc2

DAVID TICKLER @DAVIDTICKLER · 3 YEARS AGO

Now Aseeqah Davids of @UWConline “Geographic & bathymetric overlap betw 2common Squaloid sharks caught as bycatch off SA coast” #SharkRaySA

3 YEARS AGO
#SharkRaySA - Aseeqah Davids - Geographic and bathymetric overlap of two Squaloid sharks caught as by-catch off SA. pic.twitter.com/lHyOVnffUJ

@SHARKSPOTTERS · 3 YEARS AGO

C.da Silva
@mmustelus

#SharkRaySA So happy about all this science done on commercially caught sharks! Yay us.

3 YEARS AGO

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#SharkRaySA Davids: Squalidae are a diverse family of sharks, spiny dorsal fins & no anal fin

3 YEARS AGO

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#SharkRaySA Davids: mature at lengths <= 1.2 metres, some only after 30 years

3 YEARS AGO

SharkandRay2015
@SHARKandRAY2015

#SharkRaySA Davids: Squalidae have a low rate of population increase but are a common bycatch species

3 YEARS AGO

https://storify.com/learn2divetoday/sharkraysa-day-2.html
Dogsharks second most diverse group of sharks in SA and constitute 50% of bycatch in fisheries

#SharkRaySA pic.twitter.com/oXOg9KmTpg

@SASC3 · 3 YEARS AGO

#SharkRaySA Davids: other research has focused on commercially important species but not on small Squalid sharks

3 YEARS AGO

#SharkRaySA Davids: 25 species (5 endemic) species of dogfish (Squalidae) occur around SA coast

3 YEARS AGO

Davids: S. acutipinnis and S. mitsukurii together make up more than 50% of by-catch off the coast of SA. #SharkRaySA

3 YEARS AGO

#SharkRaySA Davids: bluntnose spiny dogfish & shortspine spurdog occur in overlapping habitats around SA coast

3 YEARS AGO
C.da Silva
@mmustelus

#SharkRaySA Davids: difference between the two is largely the length of the nose. S. mitsikurii is larger (1.2 m) than S. Acutipinnis

#SharkRaySA - Two sharks which look almost identical, but have some very different characteristics!
pic.twitter.com/i5pStsdHq2

C.da Silva
@mmustelus

#SharkRaySA: Davids: Squalus acutipinnis was formerly known as S. megalops.

#SharkRaySA Davids: sampling was conducted by routine demersal surveys from Orange River to beyond Port Elizabeth
#SharkRaySA Davids: data was received from @DAFFisheries - species, co-ordinates of capture, weight, total length

3 YEARS AGO

#SharkRaySA Davids: overlap in distribution, however significant difference in depth preference for S. Acutipinnis

3 YEARS AGO

#SharkRaySA Davids: increase in depth decreases the size of S. mitsikurii.

3 YEARS AGO

#SharkRaySA Davids: S.m occur deeper than S. a. Spatial partitioning decreases competition for food resources.

3 YEARS AGO

#SharkRaySA Davids: data may indicate habitat partitioning, segregation by depth, size and species

3 YEARS AGO

#SharkRaySA Davids: preliminary dietary results show cephalopods, teleosts most important in the diet of both S. acutipinnis & mitsukurii

3 YEARS AGO

#SharkRaySA Davids: with changing habitat (W to S coast), food sources changed

3 YEARS AGO
#SharkRaySA Davids: what can we conclude? Similar habitats, similar prey - the means by which they segregate habitat allows them to co-exist

Group photo at #SharkRaySA - here are half the participants! (This photo taken from inside the group...) pic.twitter.com/TGMp2w59Kd

First #SharkRaySA talk after lunch is keynote by Dr Malcolm Smale of @BayworldPE “Communicating shark science – from funding to publication”
#SharkRaySA - Last keynote speaker, Dr Malcolm Smale - “communicating shark science, from funding to publication” pic.twitter.com/t3d4Fb4DS6

SHARK SPOTTERS @SHARKSPOTTERS · 3 YEARS AGO

SharkandRay2015 @SHARKandRAY2015

#SharkRaySA Smale: scientists used to work in the background, only occasionally communicating w/ wider public

3 YEARS AGO

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#SharkRaySA Smale: this has changed... How do we communicate? How has technology enabled & changed scientists' communication w/ public?

3 YEARS AGO

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#SharkRaySA Smale: on getting funding - develop idea/project, collaborations critical (c.f. Gennari’s talk) e.g. @OCEARCH, @OceanTracking

3 YEARS AGO
#SharkRaySA Smale: what do funders want? Read the fine print! Requirements are specific & your proposal must “fit”

3 YEARS AGO

#SharkRaySA Smale: important to understand the fine print when applying for funding. Salesmanship is important

3 YEARS AGO

#SharkRaySA Smale: think of a funding application as a sales pitch, not just to funders

3 YEARS AGO

#SharkRaySA Smale: explain your field thoroughly, be specific in your proposal

3 YEARS AGO

#SharkRaySA Smale: funder will examine previous successes of your team

3 YEARS AGO

#SharkRaySA Smale: make the title of your proposal accurate & interesting

3 YEARS AGO

#SharkRaySA Smale: accurate and stimulating title is important when applying for funding. Proposal should be exciting.

3 YEARS AGO

https://storify.com/learn2divetoday/sharkraysa-day-2.html
#SharkRaySA Smale: in your proposal don’t use jargon; be concise

#SharkRaySA Smale: explain who will benefit from the work you propose to do

#SharkRaySA Smale: important to communicate the bigger picture related to the study.

#SharkRaySA Smale: is the work possible within the proposed budget & timespan?

#SharkRaySA Smale: guaranteed co-sponsorship may attract more funders

#SharkRaySA Smale: funding possibilities - @WWF, @saveourseas, NRF, WIMSA, The Rufford Foundation, etc

#SharkRaySA Smale: which form of output is most appropriate for your work?
#SharkRaySA Smale: consider potential citation rates, costs, impacts of the output type selected

3 YEARS AGO

#SharkRaySA Smale: aim for international journals; but local journals have their role & are critically NB

3 YEARS AGO

#SharkRaySA Smale: How important is it all? Publication is seen as most NB criteria for judging scientific output

3 YEARS AGO

How can we predict publication success & communicate research? Great keynote by Dr Malcolm Smale #SharkRaySA pic.twitter.com/mZswMzkxOH

3 YEARS AGO

#SharkRaySA Smale: studies suggest that publications pre-PhD correlate with long term success

3 YEARS AGO
#SharkRaySA Smale: early publication is vital for young scientists!

3 YEARS AGO

#SharkRaySA Smale: publication tips - plan research with hypotheses, ensure a large enough dataset for analysis

3 YEARS AGO

#SharkRaySA Smale: decide on the focus of the paper; title must be sharp; outline must be clear

3 YEARS AGO

#SharkRaySA Smale: who’s named as authors on the paper? In what order? Why? (Involvement w/ ideas, analysis, funding, etc)

3 YEARS AGO

#SharkRaySA Smale: being named as author on a paper conveys a responsibility - must be able to defend the ideas

3 YEARS AGO

#SharkRaySA Smale: another output = popular articles, books, educational material

3 YEARS AGO

#SharkRaySA Smale: news media want expert comments for shark stories...

3 YEARS AGO
Smale: news media may edit out accuracy in favour of impact, poor knowledge of sharks by journalists

Smale: are TV & radio better than newspapers? Long interview may be edited down. Solution: be specific, focused, brief

Smale: wildlife documentaries are tempting avenue to communicate your work. Ensure upfront the script is accurate, appropriate

"Fake megalodon documentary was a travesty", misleading the public and creating false hype around sharks.

Smale: beware of celebrity hosts on wildlife shows - ethics, accuracy failures

Smale: Twitter is a relentless vampire of time [we agree]

Smale: websites, blogs allow use of innovative methods (e.g. humour) to convey research findings
#SharkRaySA Smale: evaluate your outputs. Meeting goals? Reaching your audience? Making a difference?

3 YEARS AGO

#SharkRaySA Smale: shark conservation issues are one aspect of human pressure on the world’s resources

3 YEARS AGO

#SharkRaySA Smale: shark science is part of conservation - how will you do it?

3 YEARS AGO

#SharkRaySA - NB for scientists to communicate clearly to effectively conserve the species they study pic.twitter.com/tWgxbtiRvo

SHARK SPOTTERS @SHARKSPOTTERS - 3 YEARS AGO
#SharkRaySA question from @UrbanEdgeSharks to Smale: what are pitfalls facing young scientists?

3 YEARS AGO

#SharkRaySA Smale: is worried by immediacy of twitter, Facebook, other social media - comments can backfire

3 YEARS AGO

#SharkRaySA Smale: easy to respond in haste when you/your research is attacked, can make the situation worse

3 YEARS AGO

#SharkRaySA Smale: other pitfalls = not thinking out hypotheses for formal publication, not carefully evaluating strategies

3 YEARS AGO
#SharkRaySA Thanks Smale, for useful tips on how to write a good project proposal to obtain funding! pic.twitter.com/qqvfW801a3

WHALEFISH @WHALEFISH_ORG - 3 YEARS AGO

Next #SharkRaySA talk from Dr Sara Andreotti @AndreottiSara of @StellenboschUni “New insights into genetic structure of South African GWS”

SHARKandRAY2015 3 YEARS AGO

#SharkRaySA Andreotti: thanks to audience for listening to a genetics talk right after lunch!

SHARKandRAY2015 3 YEARS AGO
#SharkRaySA - Sara Andreotti - New insights into the genetic structure of South African white sharks

https://storify.com/learn2divetoday/sharkraysa-day-2.html
#SharkRaySA Andreotti: another 2010 study found complete isolation of Mediterranean GWS population

3 YEARS AGO

#SharkRaySA Andreotti: 2012 study found male & female philopatry in Australia

3 YEARS AGO

#SharkRaySA - Male and female white sharks exhibit philopatry (tend to return to their place of birth)

3 YEARS AGO

#SharkRaySA Andreotti: most recent 2015 study found occasional migrations of GWS between SA & NW Atlantic!

3 YEARS AGO

#SharkRaySA Andreotti: do GWS from Mossel Bay, Gansbaai, False Bay mix or are they distinct populations?

3 YEARS AGO

#SharkRaySA Andreotti: how do our populations link with others globally? How much genetic diversity in the SA population?

3 YEARS AGO

#SharkRaySA Andreotti: analyse mitochondrial DNA & nuclear markers to answer these questions

3 YEARS AGO
Andreotti: biopsy free swimming white sharks - relatively easy, sterilise biopsy pole between samples

Andreotti: biopsy technique is highly informative - can analyse each sample many ways

Andreotti: sampled all around SA coastline. Attempted to collect samples on SA’s W coast too! They proved elusive

#SharkRaySA - Areas along SA coast where researchers were able to get genetic samples of white sharks pic.twitter.com/WA9Ip793ZS
Andreotti: sampled in False Bay, Gansbaai, De Hoop/Struisbaai, Mossel Bay, Bird Island/Algoa Bay - well known hotspots in SA

Andreotti: got 302 good biopsy samples

Andreotti: grouped sharks’ DNA according to their maternal lineage

Andreotti: nuclear markers enabled us to fingerprint each individual

Andreotti: had 100% success matching dorsal fin ID with genetic fingerprint

Andreotti: duplicate samples from the same shark (which she tried to avoid) were detected in the DNA analysis

Andreotti: 89% of the sharks sampled share the same maternal lineage
Andreotti: 23 of the sharks had 13 points of difference from the 89% of sharks with common lineage - a LOT!

Andreotti: a biogeographic study did not shed light on this difference

Andreotti: great white sharks are interbreeding all around SA’s coastline

Andreotti: interbreeding was confirmed by the nuclear markers

Andreotti: historically there were separate groups, but now the population is interbreeding
#SharkRaySA Andreotti: global genetic connectivity of great white sharks: South Africa has a unique haplotype [pic.twitter.com/dx6MuY4xfG](https://storify.com/learn2divetoday/sharkraysa-day-2.html)

@WHALEFISH ORG - 3 YEARS AGO

#SharkRaySA - SA white sharks genetically distinct from other populations around the world! [pic.twitter.com/EiRdfVtW35](https://storify.com/learn2divetoday/sharkraysa-day-2.html)

@SHARKSPOTTERS - 3 YEARS AGO
Andreotti: during early Pleiocene, plentiful food had GWS moving all over

Andreotti: closure of isthmus of Panama separated Atlantic, Pacific populations

Andreotti: SA GWS population is isolated by distance from other populations

Andreotti: a severe bottleneck (e.g. population decline) may have reduced the diversity of SA’s GWS

Andreotti: marine teleosts & GWS from SA show low genetic diversity
South Africa’s white sharks possess some unique genetic traits, with only 4 known matrilineal lineages

#SharkRaySA pic.twitter.com/GiKEfpVIYK

@SASC3 · 3 YEARS AGO

Andreotti: decline of genetic variation leads to reduction in evolutionary potential followed by population decline

@SHARKandRAY2015 · 3 YEARS AGO

Andreotti: based on the data, we are already in this spiral in SA - can ill afford more threats to our GWS

@SHARKandRAY2015 · 3 YEARS AGO

Next #SharkRaySA talk is Daphne Bitalo of @StellenboschUni “Genetic connectivity of the commercially important copper shark”

@SHARKandRAY2015 · 3 YEARS AGO
#SharkRaySA - Daphne Bitalo - Genetic connectivity of the commercially important Copper shark along SA coast pic.twitter.com/HFcEAFhyDX

@SHARKSPOTTERS · 3 YEARS AGO

@SHARKandRAY2015

#SharkRaySA you may know copper sharks (Carcharinus brachyurus) as “bronze whalers”

@SHARKandRAY2015

#SharkRaySA Bitalo: bronzies are constrained by the usual things that plague large sharks - late maturity, slow reproduction, fishing

@SHARKandRAY2015

#SharkRaySA Bitalo: need for genetic connectivity on Atlantic/Indian Ocean barrier for large sharks such as bronzes

@SHARKandRAY2015
#SharkRaySA - SA has 3 distinct bioregions - essentially supporting different groups of organisms. pic.twitter.com/bitsbcXIe2

SHARK SPOTTERS @SHARKSPOTTERS · 3 YEARS AGO

#SharkRaySA Bitalo: estimated levels of genetic diversity, tested for genetic diversity between populations of bronzies on SA coast

3 YEARS AGO

#SharkRaySA Bitalo: @SASC3 provided 89 samples from 7 sites, from recreational fishers

3 YEARS AGO

#SharkRaySA Bitalo: no genetic differentiation of populations across ocean boundaries was found

3 YEARS AGO
#SharkRaySA Bitalo: bronze whaler sharks- no strong indication of inter-oceanic structure across Cape Agulhas.

Results indicated some substructure in bronze whaler shark populations in SA. May be philopatric females #SharkRaySA pic.twitter.com/aazf9JipbA

#SharkRaySA Bitalo: there was a genetic difference between the Strandfontein & rest of False Bay bronzie populations - site fidelity?

#SharkRaySA Bitalo: how many populations exist within the study area? Analysis suggested three.

#SharkRaySA Bitalo: bronzies/copper shark population in SA has declined severely - need for sustainability measures!
Next up Gibbs Kuguru of @StellenboschUni on genetic diversity of smooth hammerhead sharks #SharkRaySA

Kuguru speaks on “Molecular assessment of genetic diversity & population connectivity of smooth hammerhead sharks in SA” #SharkRaySA

#SharkRaySA - Gibbs Kuguru - Genetic diversity and population connectivity of smooth hammerhead sharks in SA pic.twitter.com/AOhZZHQgL0

Kuguru: is also working with Oceans Research & @WhiteSharkZA
EleanorYeldHutchings
@Eleanor_YH

#sharkraysa Kuguru: few existing data on smooth hammerhead, even though fairly iconic sp. Need to establish better baseline info.

3 YEARS AGO

SharkandRay2015
@SHARKandRAY2015

#SharkRaySA Kuguru: smooth hammerheads listed as vulnerable on IUCN, listed in CITES Appendix II to protect from unsustainable trade

3 YEARS AGO

SharkandRay2015
@SHARKandRAY2015

#SharkRaySA Kuguru: smooth hammerheads migrate to cooler waters in summers (SA coast)

3 YEARS AGO

SharkandRay2015
@SHARKandRAY2015

#SharkRaySA Kuguru: species ID is a problem for smooth hammerheads (distinguish from great, scalloped hammerheads)

3 YEARS AGO

SharkandRay2015
@SHARKandRAY2015

#SharkRaySA Kuguru: aims to accurately identify smooth hammerheads using molecular tools

3 YEARS AGO

SharkandRay2015
@SHARKandRAY2015

#SharkRaySA Kuguru: will investigate genetic diversity & population connectivity on SA coastline - focuses here on genetic diversity

3 YEARS AGO

SharkandRay2015
@SHARKandRAY2015

#SharkRaySA Kuguru: primary sampling site was Mossel Bay - neonates & juveniles enter the bay in summer, swim near the surface

3 YEARS AGO
#SharkRaySA Day 2

Kuguru: aims to determine how strong philopatric relation is to Mossel Bay sampling site

Kuguru: most sharks found near harbour mouth rather than estuarine reefs (Hartenbos, Groot Brak, Klein Brak)

Kuguru: attributes presence of sharks at harbour to commercial fishing activity

Kuguru: large chumslick emanating from Mossel Bay harbour (due to commercial fishing activities) attracts large no's hammerheads

Kuguru: caught smooth hammerheads sized 0.5-1.5m, applied spaghetti tags, photographed their features

Kuguru: has not seen any sexually mature female smooth hammerheads in Mossel Bay sample area

Kuguru: will compare molecular data to morphometric data (photographs)
Shark Spotters
@SharkSpotters

#SharkRaySA - Geneticists can reference BOLD (barcode of life database) which hosts gene sequences for different animals

3 YEARS AGO

EleanorYeldHutchings
@Eleanor_YH

#sharkraysa Kuguru: Using DNA barcoding, genotyping via microsatellite markers, relatedness, to assess smooth hammerhead population

3 YEARS AGO

SharkandRay2015
@SHARKandRAY2015

#SharkRaySA Kuguru: used DNA barcoding to do species identification, based on a gene that doesn’t vary much intra-species

3 YEARS AGO

SharkandRay2015
@SHARKandRAY2015

#SharkRaySA Kuguru: gene markers were very successful for identifying smooth hammerheads

3 YEARS AGO

SharkandRay2015
@SHARKandRAY2015

#SharkRaySA Kuguru: there were indications of inbreeding in the sample, but sample comprised juveniles that may come from same litters

3 YEARS AGO

SharkandRay2015
@SHARKandRAY2015

#SharkRaySA Kuguru: 61% of individuals were half siblings, 3% were full siblings!

3 YEARS AGO

SharkandRay2015
@SHARKandRAY2015

#SharkRaySA Kuguru: expected in shark species where litters are sired by many males

3 YEARS AGO
#SharkRaySA Kuguru: data shows smooth hammerheads are highly related, little genetic diversity between sampling seasons

#SharkRaySA Kuguru: if similar genetic profiles repeat year after year we can infer philopatry

#SharkRaySA Kuguru: these results suggest that the Mossel Bay smooth hammerheads are highly vulnerable - low genetic diversity

Low genetic diversity in smooth hammerhead sharks indicates need for increased management

#SharkRaySA Kuguru: future work includes inclusion of acoustic telemetry work
Congrats Gibbs!!! Best student award, you deserved it buddy 😊😊😊 pic.twitter.com/G3fFD7kJUn

The next #SharkRaySA speaker is conservation geneticist Simo Maduna @BYLLIRAI of @StellenboschUni on smooth-hound sharks
#SharkRaySA - Simo Maduna - Unravelling the evolutionary origin of the shark genus Mustelus in Southern Africa pic.twitter.com/otccZnzWo5

@SHARKSPOTTERS · 3 YEARS AGO

Maduna: “Unravelling the evolutionary origin of the shark genus Mustelus in SA using a molecular phylogenetic approach” #SharkRaySA

@SHARKandRAY2015 · 3 YEARS AGO

More on Maduna’s research via @saveourseas: goo.gl/O1MP9a #SharkRaySA

@SHARKandRAY2015 · 3 YEARS AGO

#SharkRaySA Maduna: there are three Mustelus species in Southern African waters

@SHARKandRAY2015 · 3 YEARS AGO
#SharkRaySA Maduna: Mustelus species may be distinguished via the presence/absence of white spots

3 YEARS AGO

C.da Silva
@mmustelus

#SharkRaySA Maduna: white spotted mustelus are Aplacental, mustelus with no white spots are placental

3 YEARS AGO

C.da Silva
@mmustelus

#SharkRaySA Maduna: did Mustelus species arrive from a northern ancestor through south east Atlantic Ocean from the Mediterranean Sea ?

3 YEARS AGO

#SharkRaySA Maduna: collaboration is essential to obtain samples from a wide geographic area (here, Mediterranean & SA)

3 YEARS AGO

#SharkRaySA Maduna: next step after sampling is to choose the phylogenetic marker to use

3 YEARS AGO

#SharkRaySA Maduna: Mustelus mustelus came from Mediterranean to SA

3 YEARS AGO
#SharkRaySA - 3 diff colonisation events of Mustelus from the Med, some coming down the west coast, some east coast! pic.twitter.com/QOD3c4tu2d

@SHARKSPOTTERS · 3 YEARS AGO

@SHARKandRAY2015 @mmustelus Exactly what Charles Darwin once said.... Thank you to all my collaborators http://t.co/fqdBloNRpk

@SHARKandRAY2015 @mmustelus Exactly what Charles Darwin once said.... Thank you to all my collaborators pic.twitter.com/fqdBloNRpk

SIMO N. MADUNA @BYLLIRAI · 3 YEARS AGO

SharkandRay2015

Next up Dr Kolobe Mmonwa of @KznSharks “Review of global genetic connectivity & diversity of sharks caught off SA’s E coast” #SharkRaySA

3 YEARS AGO
#SharkRaySA - Kolobe Mmonwa - Global genetic connectivity & diversity of sharks caught off the east coast of South Africa [pic.twitter.com/1SrJY9JEch](https://twitter.com/SharkSPOTTERS/status/491037446340709377)

@SHARKSPOTTERS · 3 YEARS AGO

#SharkRaySA - Mmonwa: does the @KznSharks gear affect genetic diversity by catching sharks? What factors shape genetic structure on SA coast?

@SHARKandRAY2015 · 3 YEARS AGO

#SharkRaySA - Mmonwa: studied great white, pigeye, copper, spinner, bull & dusky sharks. [Some candidates in there for #StupidCommonNames!]

@SHARKandRAY2015 · 3 YEARS AGO

Pigeye sharks (*Carcharhinus amboinensis*) are also known as Java sharks

https://storify.com/learn2divetoday/sharkraya-day-2.html
#SharkRaySA - Mmonwa: Dusky shark populations around the world are genetically distinct from each other! pic.twitter.com/v2HO67aBHa

SHARK SPOTTERS @SHARKSPOTTERS · 3 YEARS AGO

SharkandRay2015 @SHARKandRAY2015

#SharkRaySA Mmonwa: studies indicate in most of the shark species studied there is no gene flow across Atlantic, Pacific oceans

3 YEARS AGO

SharkandRay2015 @SHARKandRAY2015

#SharkRaySA Mmonwa: pigeye & bull sharks showed high gene flow along W Indian & Pacific oceans

3 YEARS AGO

SharkandRay2015 @SHARKandRAY2015

#SharkRaySA Mmonwa: GWS do occasionally make trips across Indian & Atlantic oceans, but insufficient in number to maintain genetic diversity

3 YEARS AGO
Next up Charne Rossouw of @StellenboschUni “Multiple paternity assessment in three commercially exploited shark species in SA” #SharkRaySA

The three species Rossouw focuses on are: common smooth-hound, dusky and scalloped hammerhead sharks #SharkRaySA

Rossouw: data on mating systems should be included in development of conservation strategies

Rossouw: tested litters of dusky & scalloped hammerhead sharks for multiple paternity

Rossouw: found multiple paternity in all 3 species (average # sires per litter 1.4-2.0 depending on species)

Rossouw: multiple paternity for smoothhounds, dusky and scalloped hammerhead sharks. 67%smoothhounds have multiple paternity.
Smoothound, dusky & smooth hammer sharks are sleeping around! Genetics prove multiple dads in these spp #SharkRaySA pic.twitter.com/eru6sbGMEo

Rossouw: uncertainty as to reason for multiple paternity. Reduces inbreeding/increase fecundity?

Rossouw: increase diversity in a population because more males mating successfully OR...

Rossouw: ...increase diversity in a litter but decrease # of young per male?

Rossouw: in several species the females can store sperm - allows sperm to mix
#SharkRaySA Rossouw: sperm storage occurs in dusky & scalloped hammerhead sharks. Not sure re smoothhounds

#SharkRaySA Rossouw: presents first evidence for multiple paternity in three shark species found off SA coast

#SharkRaySA Rossouw: factors influencing multiple paternity = polyandrous behaviour, reproductive modes, sperm storage, frequency of meeting

#SharkRaySA audience comment from Dr Cliff of @KznSharks - check literature to see whether multiple paternity exists in solitary species

Final #SharkRaySA talk of day 2 is Kirsty Wiggill of @UKZN “Phylogeography of the bull ray along the Kwa-Zulu Natal coastline”
#SharkRaySA - Kirsty Wiggill - Phylogeography of the Bull Ray along the KZN coast line. Last talk of the conference! pic.twitter.com/VWyTRezwKq

@SHARKSPOTTERS · 3 YEARS AGO

SharkandRay2015

#SharkRaySA Wiggill: bull ray samples obtained from @KznSharks

@SHARKandRAY2015 · 3 YEARS AGO

SharkandRay2015

#SharkRaySA Wiggill: bull rays have low population growth rate, long life & long gestation time

@SHARKandRAY2015 · 3 YEARS AGO

SharkandRay2015

#SharkRaySA Wiggill: bull rays under threat from fishing, urbanisation/coastal degradation

@SHARKandRAY2015 · 3 YEARS AGO

SharkandRay2015

#SharkRaySA Wiggill: no phylogeography or population level studies have been done in SA

@SHARKandRAY2015 · 3 YEARS AGO
#SharkRaySA Wiggill: bull rays are “data deficient” on IUCN Red List. Their life history traits suggest that they may be at risk

#SharkRaySA Wiggill: samples come from KZN coast via @KznSharks, from Richards Bay down to Margate

#SharkRaySA Wiggill: preliminary results indicate that bull rays from all along the KZN coast are genetically extremely similar

#SharkRaySA Wiggill: preliminary indications that the bull ray population is expanding - good news

#SharkRaySA Wiggill: analysis of molecular variance also suggests KZN bull rays probably comprise one large, interbreeding population

Closing #SharkRaySA day 2 an achievement award is presented to Dr Malcolm Smale of @BayworldPE for his contribution to SA shark science
Celebrating the research career of renown shark scientist Dr Malcolm Smale #SharkRaySA pic.twitter.com/PdAhd5Aj7O

@SASC3 · 3 YEARS AGO

#SharkRaySA Dr Smale has given 45 years of service to marine science. Retiring this year.

@SHARKandRAY2015 · 3 YEARS AGO

That’s it for the formal portion of #SharkRaySA 2015! @UrbanEdgeSharks thanks the @saveourseas @sharkcentre team & the @SharkSpotters team

@SHARKandRAY2015 · 3 YEARS AGO

@UrbanEdgeSharks mentions diversity of attendees (students, academics, govt, industry) at #SharkRaySA, stresses importance of collaboration

@SHARKandRAY2015 · 3 YEARS AGO
An epic few days of incredible shark talks! Thanks to all the amazing presenters and organisers! #SharkRaySA pic.twitter.com/QS8sfOELmt