0:0:0.0 --> 0:0:3.290  
Aaron Berger (Guest)  
Let's see here Simon before we get going can you just?

0:0:4.140 --> 0:0:7.50  
Aaron Berger (Guest)  
Let me know if you can see this presentation full screen.

0:0:9.110 --> 0:0:10.110  
Simon Hoyle  
Yep, that looks good.

0:0:11.120 --> 0:0:11.810  
Aaron Berger (Guest)  
OK great.

0:0:13.390 --> 0:0:15.950  
Aaron Berger (Guest)  
Alright well, let's go ahead and get started.

0:0:19.120 --> 0:0:21.200  
Aaron Berger (Guest)  
Yes, thanks everybody for joining.

0:0:22.320 --> 0:0:26.890  
Aaron Berger (Guest)  
This is the kickoff of the spatial stock assessment simulation experiment.

0:0:28.90 --> 0:0:41.900  
Aaron Berger (Guest)  
Webinar series and I'm going to start us off just giving a brief kind of overview in your reduction to the series before we get into a couple of presentations today from some of the analytical teams have been working with the simulation data.

0:0:45.850 --> 0:0:47.840  
Aaron Berger (Guest)  
OK, there, we go.

0:0:49.600 --> 0:0:51.770  
Aaron Berger (Guest)  
So yes, let me start off by just saying welcome.

0:0:53.270 --> 0:1:8.660  
Aaron Berger (Guest)  
On behalf of the project organizers myself Simon Hoyle Dan Gathol, Patrick Lynch and Karen Barcelo as well as others that were involved in the organization and development of the simulations.

0:1:9.860 --> 0:1:14.150  
Aaron Berger (Guest)  
Jennifer Devine Alistair Dunn, Craig Marsh, German McKenzie and Sophie Mormede.

0:1:14.950 --> 0:1:34.780  
Aaron Berger (Guest)  
Umm it's really been a long process to get to here. I've inserted in on the right here. This original flyer that we sent out and I noticed that it. It said fall 2021. That was actually the second version of this. It started back in fall 2020. So it's been quite a process to get to this point where we are today.

0:1:35.980 --> 0:1:45.630  
Aaron Berger (Guest)  
We're all really excited to to kick this webinar series off which will be 4 webinars and then culminate in a in person workshop, which I'll talk a little bit more about.

0:1:47.50 --> 0:1:57.140  
Aaron Berger (Guest)  
But just really excited to get to this point, so welcome everybody and I also wanted to acknowledge all the effort that has been put forth put forth by.

0:1:58.0 --> 0:2:11.890  
Aaron Berger (Guest)  
The folks that have been contributing to analysis over you know the past several years, but also to participants and you know folks on this call the audience as well as folks are going to be listening to this later on a recorded.

0:2:12.310 --> 0:2:15.220  
Aaron Berger (Guest)  
Umm or the recording that that we're going to do.

0:2:16.840 --> 0:2:46.410  
Aaron Berger (Guest)  
And I also wanted to call folks attention that that that are perhaps on this call or listening. Later that do not have a a you haven't been keeping up to speed with this project and need a little bit more background. We do have a GitHub site. Simon's going to post in the chat some a couple of links there, so if you're not fully up to speed on where this is and how the project developed you can browse those to get some more information. I'm not going to go through all of those details here today.

0:2:46.650 --> 0:2:50.190  
Aaron Berger (Guest)  
Umm but that resource is there for you if you'd like.

0:2:54.50 --> 0:3:4.270  
Aaron Berger (Guest)  
Just to start off with some webinar norms. This will be for this first webinar as well as the ones to come all pretty straightforward things but just to to get through them.

0:3:5.10 --> 0:3:10.550  
Aaron Berger (Guest)  
Umm of course, please make sure you're muted at all times you know unless called upon.

0:3:11.950 --> 0:3:15.770  
Aaron Berger (Guest)  
Then you can unmute and speak we're going to do questions and comments.

0:3:16.830 --> 0:3:25.720  
Aaron Berger (Guest)  
At the end of each webinar as well as at the end of I'm sorry at the end of each presentation as well as at the end of the webinar we have a dedicated discussion.

0:3:26.800 --> 0:3:37.270  
Aaron Berger (Guest)  
Time period and during that we wanna try to use the raise hand feature as much as we can you can also type in an inquiry in the chat box?

0:3:38.20 --> 0:3:40.160  
Aaron Berger (Guest)  
Umm if you prefer.

0:3:40.930 --> 0:3:49.500  
Aaron Berger (Guest)  
When the facilitator will call upon you to to you know, either unmute and ask your question or comment or read the the chat.

0:3:49.950 --> 0:3:51.620  
Aaron Berger (Guest)  
Umm for the presenter.

0:3:52.890 --> 0:4:4.20  
Aaron Berger (Guest)  
We do ask that that you try to avoid side conversations that chat box that just makes it harder to pick out which ones are questions and comments versus side side conversations, so that would be much appreciated.

0:4:5.700 --> 0:4:17.890  
Aaron Berger (Guest)  
And if you can, please turn on your video when speaking just so we have some some visuals instead of just just presentations and boxes that would be much appreciated.

0:4:19.230 --> 0:4:29.980  
Aaron Berger (Guest)  
I know that some of you might have low bandwidth issues and one of the things you can do. If you're having problems. There is you can try turning off your incoming video feature that's a feature in teams.

0:4:30.810 --> 0:4:48.20  
Aaron Berger (Guest)  
And you just go to the three dots on the bottom of your screen, and then there's a turn off. Incoming video that shouldn't affect seeing the presentations, but it would it would turn off. Other people's videos and hopefully help with bandwidth and at least help with audio so you can hear what's going on.

0:4:49.820 --> 0:4:56.830  
Aaron Berger (Guest)  
As you probably saw the webinars will be recorded and provided to folks that would like to.

0:4:57.630 --> 0:5:1.580  
Aaron Berger (Guest)  
To view it again or view it for the first time if you're in a time zone, that's not conducive to.

0:5:2.500 --> 0:5:15.690  
Aaron Berger (Guest)  
This particular time we're gonna post those on YouTube and we'll also make available. The slide decks and that all happened shortly after each webinar concludes and then lastly we just asked that everybody.

0:5:16.280 --> 0:5:24.850  
Aaron Berger (Guest)  
Umm you know is respectful and kind of each other and assume positive intent with questions comments concerns criticism Etcetera.

0:5:26.510 --> 0:5:31.140  
Aaron Berger (Guest)  
OK, I'll straightforward stuff, but we definitely want to start off with those norms.

0:5:32.440 --> 0:5:41.910  
Aaron Berger (Guest)  
In terms of kind of background or impetus for the generation of this simulation experiment. There was a couple of things that.

0:5:42.280 --> 0:5:43.530  
Aaron Berger (Guest)  
Umm that

0:5:44.910 --> 0:5:45.440  
Aaron Berger (Guest)  
really.

0:5:46.310 --> 0:5:59.550  
Aaron Berger (Guest)  
Promoted the development of this experiment, especially on a international or global stage and that's at a wide range of methods and assumptions can be applied to modelling spatial dynamics.

0:6:0.390 --> 0:6:6.60  
Aaron Berger (Guest)  
And those often get applied in specific assessment packages.

0:6:6.630 --> 0:6:7.100  
Aaron Berger (Guest)  
Umm.

0:6:8.460 --> 0:6:15.440  
Aaron Berger (Guest)  
That are that are linked to individual species or situations that are encountered by the agency sponsoring the package.

0:6:16.100 --> 0:6:19.830  
Aaron Berger (Guest)  
And so each package is is different in that respect.

0:6:20.650 --> 0:6:22.150  
Aaron Berger (Guest)  
And may have different capabilities.

0:6:22.870 --> 0:6:26.620  
Aaron Berger (Guest)  
So the spatial capabilities of these software options.

0:6:27.920 --> 0:6:41.920  
Aaron Berger (Guest)  
Often and can affect analysts decision making when constructing a model and that then in turn may influence how analysts interpret population status or modelling output and how it's used for management.

0:6:43.170 --> 0:7:14.730  
Aaron Berger (Guest)  
And there's really been little guidance about how to identify misspecification spatial structure. The literature is growing so there's some guidance. But we were looking to kind of overcome and identify some of the operational constraints of enacting spatial stock assessments and one of the ways we thought we could do that is by conducting such an experiment as this to really try to create an atmosphere where we can bring together folks that are thinking about these problems across the globe.

0:7:15.300 --> 0:7:19.810  
Aaron Berger (Guest)  
And and benefit and leverage each other's experiences.

0:7:22.680 --> 0:7:36.990  
Aaron Berger (Guest)  
So the through the three main study objectives. The first one, is to discuss best practices and spatial modelling and the development of these models and to really explore the decision points of each analyst or team of analysts and how they encounter.

0:7:37.510 --> 0:7:37.900  
Aaron Berger (Guest)  
Umm.

0:7:39.200 --> 0:7:54.530  
Aaron Berger (Guest)  
They're modelling in the particular platform or or stock assessment software that they have chosen so it's just decision. Points is really the key for our first objective is to understand how those occur, the second objective is within each platform evaluate the performance.

0:7:55.380 --> 0:8:2.760  
Aaron Berger (Guest)  
And the impacts of different spatial configurations by comparing a spatial and Spatially Aggregated models.

0:8:4.80 --> 0:8:19.130  
Aaron Berger (Guest)  
And those first two are kind of the points of this webinar series to get the first initial discussions going on, some of these things and then objective 3 is really where we're headed towards the this in person workshop, which I'll talk more about in a minute, but that is then to explore the general performance.

0:8:20.150 --> 0:8:41.460  
Aaron Berger (Guest)  
Across different categories of approaches you know non spatial approaches versus spatially implicit or spatially stratified and even full spatial temporal approaches to look at some of those differences in performance and then glean some things that we can learn from attacking similar data sets in different ways.

0:8:45.70 --> 0:8:53.680  
Aaron Berger (Guest)  
So, just real briefly the the project was initiated by using a spatial population model SPM.

0:8:54.370 --> 0:9:1.220  
Aaron Berger (Guest)  
Umm that was built out of NIWA in New Zealand with partners and we use that.

0:9:2.950 --> 0:9:7.790  
Aaron Berger (Guest)  
Analytical framework as an operating model where we essentially wanted to.

0:9:8.380 --> 0:9:19.840  
Aaron Berger (Guest)  
Umm create fine scale data sets that we could then use in a simulation framework and we did that by initially constructing 2 different operating model.

0:9:20.790 --> 0:9:21.740  
Aaron Berger (Guest)  
Sets one.

0:9:22.900 --> 0:9:54.570  
Aaron Berger (Guest)  
Loosely, based on yellowfin tuna in the Indian Ocean area, or the IOTC RFMO and then a second. One is was built around Antarctic toothfish life history, where there's ontogenetic spatial movement. There's some IPA's and things like that, so we have two kind of generic spatial scenarios or rather spatial species that have spatial dynamics that we could build our scenarios on to create these operating models to simulate find scaled data.

0:9:55.720 --> 0:10:3.190  
Aaron Berger (Guest)  
And that that really is the basis for this experiment is the are these two operating models.

0:10:4.970 --> 0:10:11.450  
Aaron Berger (Guest)  
And so pairing the operating models within our study design to meet our studies objectives. I just wanted to step through this.

0:10:12.920 --> 0:10:13.680  
Aaron Berger (Guest)  
Figure real quick.

0:10:14.640 --> 0:10:22.550  
Aaron Berger (Guest)  
So the main processor that the workflow that we have initiated is we created one simulated data set.

0:10:23.460 --> 0:10:31.80  
Aaron Berger (Guest)  
That we gave to different analysts teams to create a spatial model and we directed them to do so.

0:10:32.260 --> 0:10:36.770  
Aaron Berger (Guest)  
In a spatially aggregated way, so just one area for the whole data set.

0:10:37.490 --> 0:10:51.960  
Aaron Berger (Guest)  
And after constructing a model with that data set then we gave them 99 others for a total of 100 to iterate over and the reason they're iterated over is we have some observation error and process error in recruitment.

0:10:53.260 --> 0:10:55.670  
Aaron Berger (Guest)  
Incorporated into those different data sets.

0:10:57.310 --> 0:10:58.400  
Aaron Berger (Guest)  
And so at the end of that.

0:10:59.760 --> 0:11:6.760  
Aaron Berger (Guest)  
Exercise we have 100 panmictic or one area assessment results and then repeated that procedure.

0:11:7.250 --> 0:11:7.700  
Aaron Berger (Guest)  
Umm.

0:11:9.0 --> 0:11:14.500  
Aaron Berger (Guest)  
By instructing Alice to look at 4 areas so a spatially structured.

0:11:16.20 --> 0:11:32.710  
Aaron Berger (Guest)  
Stock assessment approach and these two combined really speak to objectives. One and two so we wanted to learn again. How decisions are made as models were constructed that first objective and then also to kind of compare spatial and non spatial model results.

0:11:33.30 --> 0:11:36.840  
Aaron Berger (Guest)  
Umm for individual teams, so within a platform.

0:11:38.430 --> 0:11:44.980  
Aaron Berger (Guest)  
And then the third objective is kind of take all of those, and look across different approaches that were done by different teams.

0:11:46.10 --> 0:11:46.710  
Aaron Berger (Guest)  
To.

0:11:48.50 --> 0:11:53.160  
Aaron Berger (Guest)  
Bring together those results and look at them and see if we can glean some interesting patterns.

0:11:53.830 --> 0:11:59.800  
Aaron Berger (Guest)  
And and that's really the point of the in person workshop coming next year.

0:12:2.770 --> 0:12:21.180  
Aaron Berger (Guest)  
In terms of what's gonna be presented and the types of results. We're looking at we have the standard set of assessment outputs and we're going to look at that by one. The The One area in four area so these are things like time series, some key parameter estimates and things like that.

0:12:22.400 --> 0:12:27.810  
Aaron Berger (Guest)  
But we also encouraged analysts to explore alternative aggregations outside of the one in 4 area.

0:12:29.60 --> 0:12:32.330  
Aaron Berger (Guest)  
And model parameterizations, you know if they had time.

0:12:33.870 --> 0:12:43.900  
Aaron Berger (Guest)  
In terms of the decision point analysis. We're looking for folks to share how their model how they went about developing the model and why specific decisions were made.

0:12:45.170 --> 0:12:50.200  
Aaron Berger (Guest)  
During that development you know what data did they use? What things what were their decision points?

0:12:51.640 --> 0:12:54.190  
Aaron Berger (Guest)  
And as part of that we are particularly interested in.

0:12:55.120 --> 0:12:59.490  
Aaron Berger (Guest)  
What were the spatial capabilities of the particular modelling platform they were using?

0:13:0.500 --> 0:13:12.140  
Aaron Berger (Guest)  
As well as its inabilities and how those influence the decisions that were made because that might be some of the things that are come to bear when we think about how to improve.

0:13:13.290 --> 0:13:18.820  
Aaron Berger (Guest)  
Stock assessment software in the future kind of Next Generation Stock Assessment Software.

0:13:20.400 --> 0:13:24.800  
Aaron Berger (Guest)  
Also, we are interested in learning about model diagnostics in a spatial sense.

0:13:25.750 --> 0:13:30.860  
Aaron Berger (Guest)  
So we wanted some discussion on how diagnostic tools were used to determine spatial parameterization.

0:13:31.870 --> 0:13:56.360  
Aaron Berger (Guest)  
And then we have the webinars as we've now started and their presentations have results and so we're asking analysts today and in the upcoming webinars to discuss some of these results with the caveat that you know as we all know stock assessment models never really end. The development and testing of them so that will be up. You know to where individual teams are to date or at the time of their webinar.

0:13:59.300 --> 0:14:4.960  
Aaron Berger (Guest)  
In terms of just a couple uh notes on the context of this experiment.

0:14:8.210 --> 0:14:19.750  
Aaron Berger (Guest)  
Teams were constructed by software platform interest and time availability so we've got nine teams, which I'll go over in a minute and just to note that these were.

0:14:20.490 --> 0:14:21.400  
Aaron Berger (Guest)  
Based on

0:14:22.620 --> 0:14:34.970  
Aaron Berger (Guest)  
interest and really time availability so it doesn't pretend to cover everything or be exhaustive, but rather we're trying to glean from folks that had time and interest.

0:14:36.460 --> 0:14:45.610  
Aaron Berger (Guest)  
The simulation experiment is really a research endeavor and although it relates to a couple specific fish species life histories.

0:14:46.40 --> 0:14:51.860  
Aaron Berger (Guest)  
Umm those were chosen as an example to address broad study objectives clearly.

0:14:52.100 --> 0:15:1.970  
Aaron Berger (Guest)  
Umm other species or stocks with different structure or stock structure. We might have some different results so there is that context there that we have.

0:15:3.600 --> 0:15:4.500  
Aaron Berger (Guest)  
Underpinning.

0:15:5.310 --> 0:15:6.150  
Aaron Berger (Guest)  
What we're doing here?

0:15:7.70 --> 0:15:15.730  
Aaron Berger (Guest)  
In terms of lessons learned We're trying to inform the scientific process really, for generating improving future assessment capabilities. That's one of our goals.

0:15:16.710 --> 0:15:23.170  
Aaron Berger (Guest)  
Umm I also wanted to note that you know, these are really research assessments, their works in progress.

0:15:23.850 --> 0:15:32.140  
Aaron Berger (Guest)  
And they're being developed. You know, essentially pro bono by analysts as side projects to their day-to-day job so.

0:15:32.210 --> 0:15:39.870  
Aaron Berger (Guest)  
So you know kudos to all the animals that have been working hard over the last couple of years to be part of this project.

0:15:40.370 --> 0:15:47.390  
Aaron Berger (Guest)  
Umm and and just to note that they are as far as they are, and we're going to learn from what they have to present.

0:15:48.490 --> 0:15:57.760  
Aaron Berger (Guest)  
And then finally the research assessments developed from this study design are not meant to directly inform operational management, although there's definitely.

0:15:59.420 --> 0:16:11.230  
Aaron Berger (Guest)  
Annual management measures that are set for both of these species what we're learning from to here is is is a much broader than that and at least at this point is not meant to inform operational management. It's a research context.

0:16:13.800 --> 0:16:18.40  
Aaron Berger (Guest)  
Analyst teams we've got nine of them that we're gonna hear from.

0:16:18.750 --> 0:16:35.760  
Aaron Berger (Guest)  
Uh today, we're going to hear from Castle, which is see if I can get this right. The C++ Algorithm Stock Assessment Laboratory. I believe, and you can see members of that team, there, they're going to be talking to us today as well as.

0:16:37.30 --> 0:16:42.690  
Aaron Berger (Guest)  
The S VAST team, so stock synthesis also using the software VAST.

0:16:43.480 --> 0:16:50.510  
Aaron Berger (Guest)  
Umm and therefore IATTC other ones that we have in upcoming webinars include teams from gadget.

0:16:51.280 --> 0:16:57.130  
Aaron Berger (Guest)  
For the globally applicable area disaggregated general ecosystem toolbox. I did have to write that one down.

0:16:58.470 --> 0:17:1.780  
Aaron Berger (Guest)  
The spatial temporal approach multifan.

0:17:3.270 --> 0:17:11.500  
Aaron Berger (Guest)  
Another stock synthesis from folks in the IOTC region. I third stock synthesis from folks in Icees region.

0:17:12.400 --> 0:17:23.810  
Aaron Berger (Guest)  
Umm another castle group that is going to be presenting on the toothfish example specifically and then also a group from the spatial stock assessment.

0:17:25.970 --> 0:17:29.500  
Aaron Berger (Guest)  
And why I should know spasms spatial pop.

0:17:30.360 --> 0:17:40.40  
Aaron Berger (Guest)  
Spatial processes and stock assessment methods. Yes, a group from them as well. So those are the teams that we're gonna be hearing from over the duration of this, the for webinar series.

0:17:42.660 --> 0:17:55.390  
Aaron Berger (Guest)  
So key features of the process include the simulation experiment, which again I encourage you to look at the GitHub sites to come up to speed if you're just new to what's going on here.

0:17:57.170 --> 0:18:7.640  
Aaron Berger (Guest)  
That then is going to feed into what we're doing now. The webinar series and then the webinar will feed into this in person workshop for March of 2023.

0:18:8.390 --> 0:18:11.240  
Aaron Berger (Guest)  
So that's kind of our our workflow or project flow if you will.

0:18:13.250 --> 0:18:35.720  
Aaron Berger (Guest)  
To that end this is the schedule. I've sent it out to most everybody. If somebody on the call does not have it. Feel free to reach out to me and I can send it to you just going over it quickly. We're here today. October 13th at least specific time of the US for our first webinar. I wanted to highlight that we have three more coming one November 21st.

0:18:36.500 --> 0:18:40.770  
Aaron Berger (Guest)  
Another one in mid-december and then another in early January.

0:18:41.800 --> 0:19:0.650  
Aaron Berger (Guest)  
And we could see who was presenting on each one of those in the the kind of draft agenda. Also, this March 5th to the 7th is the culmination of this experiment and webinars in an in person workshop, which is going to be in Wellington, New Zealand. It's going to be over 2 1/2 days.

0:19:1.840 --> 0:19:9.90  
Aaron Berger (Guest)  
We will send out a a an agenda for that as as that draws a little bit nearer. But we wanted to get that everybody's calendar now.

0:19:10.390 --> 0:19:13.280  
Aaron Berger (Guest)  
And I'll talk next about what kind of work.

0:19:14.530 --> 0:19:17.40  
Aaron Berger (Guest)  
What's coming up or what the goals are for that workshop?

0:19:18.950 --> 0:19:34.160  
Aaron Berger (Guest)  
So what we'd like to do is compare agree results across modelling frameworks. To understand influence of model structure that chosen by different analyst teams and that could be you know the one area of panmictic assessment.

0:19:34.840 --> 0:19:47.70  
Aaron Berger (Guest)  
Also assessment that uses a fleets's areas or areas as fleets approach and then some of these other spatially stratified spatiotemporal. Etcetera approaches to incorporating spatial dynamics into stock assessment.

0:19:48.410 --> 0:19:58.730  
Aaron Berger (Guest)  
And so this will be the forum for kind of presenting and discussing and creating recommendations for stock assessments that use that explore those approaches.

0:20:0.320 --> 0:20:5.10  
Aaron Berger (Guest)  
We also want to encourage analysts and others to further to explore and compare.

0:20:7.880 --> 0:20:11.790  
Aaron Berger (Guest)  
Methods and processes for building spatial stock assessments.

0:20:12.430 --> 0:20:22.300  
Aaron Berger (Guest)  
Umm and and kind of use that as a forum to to develop recommendations for operationalizing stock assessments.

0:20:23.700 --> 0:20:29.170  
Aaron Berger (Guest)  
We're also going to use that as an opportunity to share experiences and lessons learned from.

0:20:29.770 --> 0:20:35.70  
Aaron Berger (Guest)  
Uh practical applications, so applications, potentially outside of this experiment.

0:20:36.210 --> 0:20:58.870  
Aaron Berger (Guest)  
Among international partners, and we want to discuss best practices and salient features of the next generation of spatial models, so as we move towards trying to think about what types of features and the spatial sense, let alone other senses should be included in that next generation or rather? What are some of the features that limit our capabilities currently that should be in.

0:20:59.490 --> 0:21:3.640  
Aaron Berger (Guest)  
Umm next generation software, or stock assessment frameworks.

0:21:4.840 --> 0:21:6.790  
Aaron Berger (Guest)  
So those are really kind of our goals of the workshop.

0:21:9.470 --> 0:21:20.20  
Aaron Berger (Guest)  
And just as I'm starting to wind down here. I wanted to just note that we do have some discussions questions that we'd like to hit on during these webinars.

0:21:20.520 --> 0:21:23.900  
Aaron Berger (Guest)  
Umm the analyst might be speaking to these directly.

0:21:25.170 --> 0:21:37.500  
Aaron Berger (Guest)  
But just to put some of these in folks minds as we go through the webinar series there might be things to think about in terms of spatial data So what data types are needed to fit spatial stock assessments.

0:21:38.210 --> 0:21:54.670  
Aaron Berger (Guest)  
We want to keep in the back of my mind. What novel or unique data types could be helped to parameterize spatial models. You might be that certain there's new data available or novel data but particular assessment platform isn't capable of incorporating that data and how should it maybe.

0:21:55.770 --> 0:22:0.330  
Aaron Berger (Guest)  
And that leads into modelling capabilities? What are the most useful and important to you?

0:22:1.550 --> 0:22:3.400  
Aaron Berger (Guest)  
What are there are there different options?

0:22:4.220 --> 0:22:9.180  
Aaron Berger (Guest)  
And how useful would they be and how available are they or unavailable.

0:22:10.60 --> 0:22:13.830  
Aaron Berger (Guest)  
What limits current spatial assessment platforms and how might these be overcome?

0:22:14.960 --> 0:22:41.990  
Aaron Berger (Guest)  
We also want to discuss diagnostics clearly a big one and A an interesting and current topic, especially for spatial models is what type of diagnostic tools and residual analysis are useful for diagnosing model miss structure or misspecification rather and things like that, and you know, getting an idea of how folks arrived at the final model for parameterization that they did.

0:22:43.60 --> 0:22:56.180  
Aaron Berger (Guest)  
In terms of management what factors and limit wider implementation of spatial assessments, and how all these might be addressed in the future, and also thinking about biological reference points in a spatial context.

0:22:57.310 --> 0:22:59.160  
Aaron Berger (Guest)  
And how how we go about developing those.

0:23:1.340 --> 0:23:8.60  
Aaron Berger (Guest)  
So those are some of the questions. We want to be thinking about during these webinars and and maybe revisit during open discussion time.

0:23:10.370 --> 0:23:19.60  
Aaron Berger (Guest)  
So I just uh again a big. Thank you to all the participants and for your participation and attention and for coming to this webinar.

0:23:20.500 --> 0:23:30.720  
Aaron Berger (Guest)  
I've added the GitHub resources here. These are the same ones that Simon posted in the chat. But I wanted to have them there in case folks were tuning in via recorded session.

0:23:31.440 --> 0:23:37.730  
Aaron Berger (Guest)  
Umm and you know, I really encourage folks to check out all the information. There's a lot there on that GitHub site.

0:23:38.480 --> 0:23:48.330  
Aaron Berger (Guest)  
Umm yeah, yeah, a lot of good information so with that. I am going to stop screen sharing and before we move to.

0:23:50.70 --> 0:23:52.620  
Aaron Berger (Guest)  
Our first presenter.

0:23:55.100 --> 0:24:0.360  
Aaron Berger (Guest)  
I'll pause here to see if anybody has any questions or comments kind of on just the overall structure.

0:24:1.150 --> 0:24:6.970  
Aaron Berger (Guest)  
Umm how we got to where we are today and how we're going to be moving forward through the the webinar series.

0:24:31.650 --> 0:24:32.90  
Aaron Berger (Guest)  
OK.

0:24:32.850 --> 0:24:35.740  
Aaron Berger (Guest)  
Now that I've got my setup backup OK any questions.

0:24:37.430 --> 0:24:41.420  
Aaron Berger (Guest)  
Feel free to use the raise hand feature or type, it in chat if there are any.

0:24:53.280 --> 0:24:56.270  
Aaron Berger (Guest)  
And I'll just give it a minute here in case somebody's typing something in.

0:25:4.20 --> 0:25:22.920  
Pamela (Guest)  
It's just me typing something in Aaron to say Pamela is Pamela Mason. I'm just gonna be listening in off and on so I couldn't I couldn't edit the participants to give you my full name. So I thought I'd better say who I am I'm not a Luca well, I am sort of.

0:25:27.0 --> 0:25:30.110  
Aaron Berger (Guest)  
Thank you. Pamela yes, happy to have you welcome?

0:25:36.910 --> 0:25:51.280  
Aaron Berger (Guest)  
OK great well, I wasn't expecting much in the way of of discussion on the the kind of introduction here, so without further ado, Simon maybe I'll pass over to you to introduce Jeremy.

0:25:55.80 --> 0:26:4.910  
Simon Hoyle  
Second, Yep, I'm Jeremy's A stock assessment scientist at NIWA in Auckland and he's been also being part of the wider organising group of the spatial modelling workshop.

0:26:6.530 --> 0:26:9.430  
Simon Hoyle  
So he's gonna be presenting on the castle.

0:26:10.650 --> 0:26:13.40  
Simon Hoyle  
Work on the yellowfin Indian Ocean yellowfin tuna.

0:26:14.480 --> 0:26:17.110  
Simon Hoyle  
The other people who've been involved in that at Craig Marsh.

0:26:18.430 --> 0:26:28.0  
Simon Hoyle  
Reserva and I've also been involved in some sort of Review and advice level, so right, I'll pass over to Jeremy.

0:26:29.250 --> 0:26:30.240  
Jeremy McKenzie  
Thank you Simon.

0:26:31.760 --> 0:26:37.710  
Jeremy McKenzie  
Good afternoon or morning, depending on what time zone, you are I will I will get into the presentation.

0:26:37.970 --> 0:26:40.780  
Jeremy McKenzie  
I am not meaning to sort of.

0:26:42.540 --> 0:27:11.830  
Jeremy McKenzie  
Sort of if the gate responsibility, but Craig Marsh is unfortunately not able to be with us today because he's had a a. A family emergency and he was going to be doing the bulk of the presentation and is more intimately understanding of castles capabilities and some of the modelling that's being done. Today, that we're gonna present, but I I've also got a pretty strong overview of what's going on, but some of the technicalities, I might not be able to?

0:27:13.10 --> 0:27:17.420  
Jeremy McKenzie  
They cover is is well or answer questions as well as Craig.

0:27:17.740 --> 0:27:23.90  
Jeremy McKenzie  
I'm could, but be with us and apologies from Craig.

0:27:25.870 --> 0:27:27.190  
Jeremy McKenzie  
I'm sorry uh.

0:27:28.350 --> 0:27:31.750  
Jeremy McKenzie  
This is uh as everybody says is have been talking about is that?

0:27:32.510 --> 0:27:50.910  
Jeremy McKenzie  
Hassle Castro Castle, 2 interpretation of the IO? What yellow container simulated datasets. We've been sort of using castle and Castle 2 interchangeably. We initially started development with Castle, one because it was more convenient but.

0:27:52.350 --> 0:27:57.460  
Jeremy McKenzie  
We've been using castle tours as as much as Castle, one in the latter stages of this.

0:28:0.740 --> 0:28:6.30  
Jeremy McKenzie  
So I just give a brief overview of Castle Stroke Castle 2.

0:28:7.90 --> 0:28:13.860  
Jeremy McKenzie  
It the modelling platform is spatially explicit and can include multiple spawning stocks.

0:28:14.600 --> 0:28:17.0  
Jeremy McKenzie  
Umm that are separated.

0:28:17.80 --> 0:28:21.310  
Jeremy McKenzie  
And it and have different recruitment relationships.

0:28:22.800 --> 0:28:26.550  
Jeremy McKenzie  
Spray spaces expressed by category definitions.

0:28:26.930 --> 0:28:29.120  
Jeremy McKenzie  
Umm and UM.

0:28:30.410 --> 0:28:34.600  
Jeremy McKenzie  
Then basically limited by data or or computational constraints.

0:28:36.200 --> 0:28:41.250  
Jeremy McKenzie  
Most spatially explicit stock assessments and New Zealand assume nail for Taylor Pedelty.

0:28:41.910 --> 0:29:7.760  
Jeremy McKenzie  
I Tessa at the moment is pretty much geared around a Natal fatality for structure. It doesn't really handle markovian mixing in a true sense in this largely based on the way we use an assume spatial structure and New Zealand stock assessments, so the ones that are using specifically spatial.

0:29:9.200 --> 0:29:41.700  
Jeremy McKenzie  
Configurations are the Antarctic toothfish, uh CSMS that we undertake as part of Camila Snapper 1 assessment, which is the named Snapper Stock Pagrus Auratus, which I'm involved with the hokey is a big one. And we've also used it for Caroline and other some other species as well. So the spatial dynamics of castle of being largely directed at the needs and assumptions around how we deal with spacing the New Zealand environment.

0:29:43.70 --> 0:29:47.300  
Jeremy McKenzie  
Castle can account the tag release, so that's one of the features of it.

0:29:47.420 --> 0:29:53.840  
Jeremy McKenzie  
Umm yeah, and it's geared around it's it's different from stock synthesis it.

0:29:54.600 --> 0:29:58.210  
Jeremy McKenzie  
Interprets tags relative to length and not specifically age.

0:29:58.810 --> 0:29:59.470  
Jeremy McKenzie  
Umm.

0:30:0.710 --> 0:30:3.500  
Jeremy McKenzie  
Sorry anyway, yeah that's just sort of a general overview of Castle.

0:30:7.30 --> 0:30:11.640  
Jeremy McKenzie  
Umm so we took an approach with this study.

0:30:12.860 --> 0:30:24.930  
Jeremy McKenzie  
To basically first characterize the data that was provided to us so try and understand what sort of spatial or temporal dynamics were going on by investigating the information.

0:30:25.650 --> 0:30:40.620  
Jeremy McKenzie  
And then month basis, that we started to develop models that we thought would deal with the patterns that we were seeing in the data and we followed our starts temple and build complexity approach.

0:30:41.280 --> 0:30:41.770  
Jeremy McKenzie  
Umm.

0:30:44.100 --> 0:30:48.690  
Jeremy McKenzie  
And today we're going to talk about the the steps that we followed to to go through this.

0:30:51.380 --> 0:30:57.230  
Jeremy McKenzie  
So First off the characterization aspect of of the data. We we looked at the.

0:30:58.290 --> 0:31:1.290  
Jeremy McKenzie  
Initially, the tagging data the see what that could tell us.

0:31:2.720 --> 0:31:18.830  
Jeremy McKenzie  
And there are couple of things that we noticed there that the 1st that the tag releases appeared to be what we call spatially unbalanced. The they were from one particular area, or or a limited release area and recoveries in multiple areas, but

0:31:18.900 --> 0:31:30.980  
Jeremy McKenzie  
the the the movement information that that provided that information about reciprocal movements. So it was, it was going to be a bit limited in what it could show us but it does show us that the?

0:31:31.50 --> 0:31:35.120  
Jeremy McKenzie  
But that fish are moving around in space and time.

0:31:35.800 --> 0:31:44.50  
Jeremy McKenzie  
And there was an indication in the tagging data are also of seating seasonal patterns and and in recaptures.

0:31:47.530 --> 0:31:54.970  
Jeremy McKenzie  
Umm I think Craig would do a better job of explaining this. It's sort of shows you how hassle is is dealing with.

0:31:56.360 --> 0:32:7.550  
Jeremy McKenzie  
Tagging information and how it actually interprets it. It's it's it's basically fitting to a mark rate, which it it, it, which it generates.

0:32:8.160 --> 0:32:14.380  
Jeremy McKenzie  
Uh I think the key point Craig wanted to make with this is that Castle is really.

0:32:16.100 --> 0:32:33.160  
Jeremy McKenzie  
Time give you an air if it can give you movement and it can give you biomass. But it can't give you necessary an exploitation rate largely because it's sort of focused around the tagging aren't the tag recoveries aren't specific to fisheries the concept is around gained fish.

0:32:33.880 --> 0:33:3.450  
Jeremy McKenzie  
Umm and in the way we've sort of marked the fish in New Zealand assessment so that you. You know a fixed number of fish. You scanned and it's it's in the the size structure but you've not necessarily concerned about which fishery it's come from and that's just the the way we, we view tagging data. So Casal is is kind of limited in terms of trying to get an exploitation rate, but it will give movement and will give biomass which is what it's been designed to do.

0:33:4.640 --> 0:33:5.130  
Jeremy McKenzie  
Umm.

0:33:6.490 --> 0:33:23.160  
Jeremy McKenzie  
So Castle sort of essentially A tag uh, Petersen estimator for each length, then you. You set the set the the the information's coming by length, so you basically are getting a population mark rate by by length.

0:33:23.880 --> 0:33:40.550  
Jeremy McKenzie  
Umm and as I said with Newsed informed biomass and that the growth and and we can get growth out of it. Of course, with which we from release recovery information. So we'll tell us growth as well, and be and be able to interpret growth information when tagging information.

0:33:41.470 --> 0:33:42.160  
Jeremy McKenzie  
Umm.

0:33:43.520 --> 0:33:46.770  
Jeremy McKenzie  
Yeah, crazy, it's not telling us about EF.

0:33:48.450 --> 0:33:49.760  
Jeremy McKenzie  
We uh.

0:33:50.610 --> 0:33:58.660  
Jeremy McKenzie  
We we decided not to use tagging information in the initial single area model.

0:33:59.330 --> 0:34:0.80  
Jeremy McKenzie  
Umm.

0:34:0.870 --> 0:34:15.960  
Jeremy McKenzie  
But uh larger because the the data was deemed to be we deemed it to be specially on on balanced and probably problematic. So we haven't we haven't used it as such in the in the single area models.

0:34:19.560 --> 0:34:23.910  
Jeremy McKenzie  
The next thing we looked at was the catch information to see what that would tell us.

0:34:24.590 --> 0:34:29.200  
Jeremy McKenzie  
Umm besides the long line information there's no.

0:34:30.530 --> 0:34:39.240  
Jeremy McKenzie  
Which is giving us CPUE there's no effort information provided with the most of the catch versus the fishery catch information.

0:34:39.890 --> 0:34:52.80  
Jeremy McKenzie  
So we sort of assumed that that that the catch rightly along wrongly was telling us something about abundance, but that might not necessarily be correct.

0:34:53.490 --> 0:34:56.980  
Jeremy McKenzie  
The spatial distributions of the catch show that.

0:34:57.60 --> 0:34:57.610  
Jeremy McKenzie  
The.

0:34:57.680 --> 0:34:57.820  
Jeremy McKenzie  
The.

0:34:59.450 --> 0:35:28.60  
Jeremy McKenzie  
This the spatial change through time you can see that the in the gillnet fishery. It's it's it occurs in the I guess Southern Indian Ocean. It certain seasons in the early part of the fishery and then disappears and question is whether that's a abundance signal or not, but there's there's what you take from this, or what we took from this is there's there's definite spatial.

0:35:28.940 --> 0:35:36.970  
Jeremy McKenzie  
Variability in terms of what we the fisheries are are are operating, and and catching through time and space.

0:35:38.490 --> 0:35:43.740  
Jeremy McKenzie  
That we need to recognize in some way or be aware of when we're interpreting the the data.

0:35:44.960 --> 0:35:53.30  
Jeremy McKenzie  
The other thing we looked at was the length composition of the data and the characterization and the two things that came out from that.

0:35:54.540 --> 0:36:3.830  
Jeremy McKenzie  
The graph on the right shows for the handline fishery that the length cumulative length compositions are changing through time.

0:36:4.720 --> 0:36:26.850  
Jeremy McKenzie  
So that does does the summit there's evidence there that we've got a shift in in in in either the population or the selectivity of the fishery, but there's like this, temporal dynamics in terms of the length composition. The other thing that is, we're aware of and dealing with this is on the plot on the right shows the individual.

0:36:27.860 --> 0:36:32.40  
Jeremy McKenzie  
Overlaid length frequencies for the years in in areas.

0:36:32.740 --> 0:36:35.720  
Jeremy McKenzie  
And they're very sparse.

0:36:37.80 --> 0:36:38.930  
Jeremy McKenzie  
Yeah, so there's a?

0:36:39.890 --> 0:36:52.400  
Jeremy McKenzie  
There's limited uh there's reduced power in the data due to the to the sparseness of of the information that will limit how much you can draw out of the of any assessment from it, so those are things that we?

0:36:53.150 --> 0:36:57.80  
Jeremy McKenzie  
Had to consider when we were interpreting and using this data.

0:37:2.50 --> 0:37:19.860  
Jeremy McKenzie  
So, we, we, we looked at 343 modelling approaches and we have to do an apology here. We we've done a single area model, which and then we still with the pen metric data. Guess we had took a a fleets's areas approach.

0:37:20.520 --> 0:37:25.240  
Jeremy McKenzie  
Uh to add complete to complexity to see if we can improve spatial.

0:37:26.530 --> 0:37:56.940  
Jeremy McKenzie  
Uh accountability by by taking applets as areas approach. We have developed a more a specific 4 area model. But we've just been limited with time and that's not necessarily at as well. It isn't at a final stage that we can actually use it. We hopeful that between now and the bit. Wellington and person workshop where we might have some results of that, but it's it's unfortunately we.

0:37:57.60 --> 0:38:11.910  
Jeremy McKenzie  
We just ran out of time and we haven't done completed the analysis. With that which we'd like to do, but we're at So what we're gonna be talking about today is the single area model and the fleets as Area model results that we've got.

0:38:13.200 --> 0:38:17.150  
Jeremy McKenzie  
So I'll start with the single area model.

0:38:19.190 --> 0:38:31.770  
Jeremy McKenzie  
So we had first we had to look at the temporal asleep so the and we didn't necessarily like the pseudo year versus annual year was seasons aspect of the data.

0:38:31.840 --> 0:38:32.60  
Jeremy McKenzie  
Yeah.

0:38:33.340 --> 0:38:48.520  
Jeremy McKenzie  
We would have we initially would have preferred to start off by aggregating into true annual and having seasonality. But the modelling which which we started with castle doesn't allow us to?

0:38:49.690 --> 0:38:53.630  
Jeremy McKenzie  
Assign a specific recruitment dive across seasons.

0:38:54.430 --> 0:39:11.780  
Jeremy McKenzie  
Umm, which castle two will do, but we haven't had much of a chance to explore that at the moment, so because of that limitation. We we stuck with the pseudo year, convenience, which is basically you've got seasons sort of being interpreted as years.

0:39:13.800 --> 0:39:16.950  
Jeremy McKenzie  
And yeah, we, we, we ran with that.

0:39:18.350 --> 0:39:26.20  
Jeremy McKenzie  
The next question, we thought about is is how we could incorporate season, but we initially.

0:39:26.690 --> 0:39:34.100  
Jeremy McKenzie  
Umm we thought that the that that complexity would well we, we ignored the season in the initial.

0:39:34.830 --> 0:39:35.590  
Jeremy McKenzie  
Tons of the model.

0:39:36.210 --> 0:39:36.840  
Jeremy McKenzie  
Umm.

0:39:37.670 --> 0:39:49.340  
Jeremy McKenzie  
The other thing we did do which was kind of interesting is that the CASAL model. Both CASAL models will 3 CASAL Models, which are a main models are age based models.

0:39:50.540 --> 0:39:55.250  
Jeremy McKenzie  
But the observational data that's been provided is basically length based.

0:39:55.340 --> 0:40:4.910  
Jeremy McKenzie  
Umm so there's a bit of a clutch that goes on with in fitting length based data and Hbase models and that you have to push them through.

0:40:6.130 --> 0:40:8.100  
Jeremy McKenzie  
Like they just transition matrices.

0:40:8.780 --> 0:40:23.890  
Jeremy McKenzie  
So we developed a specific length based model as to test to see how well that would perform against the age based model, which was an interesting thing we thought we would try so it has the advantage of of not assuming.

0:40:24.320 --> 0:40:28.70  
Jeremy McKenzie  
Uh any age underlying age specific.

0:40:28.430 --> 0:40:42.100  
Jeremy McKenzie  
Uh complexity, although it, it, it will take a cohort and that has a specific link structure and those fish grow and according to a growth model through time.

0:40:43.360 --> 0:40:48.710  
Jeremy McKenzie  
It's so we, we gave it a try to see how all that would perform and and we'll show you some results of that.

0:40:52.490 --> 0:40:54.800  
Jeremy McKenzie  
Umm so then the?

0:40:55.940 --> 0:40:59.190  
Jeremy McKenzie  
The second model uh we developed was the.

0:40:59.890 --> 0:41:2.540  
Jeremy McKenzie  
Umm hopefully to the areas model.

0:41:3.640 --> 0:41:9.50  
Jeremy McKenzie  
Again, we had to decide whether you're incorporated the seasonality.

0:41:9.760 --> 0:41:14.930  
Jeremy McKenzie  
Umm again we assumed in the initial start there was no seasonality.

0:41:17.250 --> 0:41:18.330  
Jeremy McKenzie  
But what we could.

0:41:18.400 --> 0:41:22.20  
Jeremy McKenzie  
Yeah, the sorry I'm just wondering about skip this step here.

0:41:25.410 --> 0:41:29.780  
Jeremy McKenzie  
OK, well, maybe not. I'll talk about the fleets of the areas model so we could.

0:41:30.440 --> 0:41:33.560  
Jeremy McKenzie  
Uh in this model, we could play around with.

0:41:33.640 --> 0:41:34.210  
Jeremy McKenzie  
Umm.

0:41:35.590 --> 0:41:49.500  
Jeremy McKenzie  
Queues on the specific plates that were in sorry we and the fleets of the areas model. We have four separate long line CPUE indices that relate to the long line flats.

0:41:50.770 --> 0:41:54.320  
Jeremy McKenzie  
And so with the long line CPUE data, we could have.

0:41:54.400 --> 0:42:23.890  
Jeremy McKenzie  
Umm uh separate indices, obviously and the way we could fit those was either a single queue or a what we call a global click queue and work with selectivities or separate queues. So we explored both options of having single queues or a global queue or single queues and the other thing we could manipulate with the selectivities of the various methods and and trying to fit to the data.

0:42:27.130 --> 0:42:27.790  
Jeremy McKenzie  
Umm.

0:42:28.810 --> 0:42:32.910  
Jeremy McKenzie  
Yeah, the Fourier a model we would have liked to.

0:42:33.740 --> 0:42:44.360  
Jeremy McKenzie  
Use the tagging daughter in that one and we we're still looking at how we could there are issues with it being unbalanced and it's difficult to is to make movement parameters when you haven't got the two and from.

0:42:46.160 --> 0:43:0.570  
Jeremy McKenzie  
And there's also we found issues with the sparsity of the lowliest by method become problematic with this model. So we're we're we are hitting some issues trying to develop this model be interesting to see how others dealt with it.

0:43:2.910 --> 0:43:8.20  
Jeremy McKenzie  
OK, so here is the first, the single area model, which is an age base model.

0:43:8.800 --> 0:43:15.370  
Jeremy McKenzie  
Umm we assumed that biology was as provided so natural mortality growth.

0:43:16.320 --> 0:43:22.770  
Jeremy McKenzie  
Umm the diagnostics, we used pretty straightforward. We looked at residuals around the CPUE and length data.

0:43:23.430 --> 0:43:26.580  
Jeremy McKenzie  
Umm and we also.

0:43:27.680 --> 0:43:31.790  
Jeremy McKenzie  
Yeah, basically residual analysis on terms of data fits.

0:43:32.640 --> 0:43:40.420  
Jeremy McKenzie  
Umm we also used likelihood comparisons as part of the diagnostics as we altered model assumptions.

0:43:41.470 --> 0:43:48.850  
Jeremy McKenzie  
And the main explorations for this model were changing selectivity and looking at the improvements to the to fits.

0:43:50.50 --> 0:43:55.250  
Jeremy McKenzie  
Now, when we were going through all our different seed activity modelling.

0:43:56.520 --> 0:43:58.790  
Jeremy McKenzie  
Parameterization investigations.

0:43:59.490 --> 0:44:0.700  
Jeremy McKenzie  
We keep the

0:44:0.810 --> 0:44:8.410  
Jeremy McKenzie  
and specific weightings of the compositional and the CPU data constant so that we could compare the different models.

0:44:8.570 --> 0:44:30.300  
Jeremy McKenzie  
Umm and most in virtually across all likelihood spaces. They were all comparable in the final model, which we present as a guess our our result. We used the Francis Reweighting approach, which is pretty standard in New Zealand to balance the compositional and Bonance.

0:44:30.450 --> 0:44:35.640  
Jeremy McKenzie  
And fat in the model, but that wasn't done when we were comparing the models of voting on the final model.

0:44:39.270 --> 0:44:39.820  
Jeremy McKenzie  
Oops.

0:44:42.180 --> 0:44:43.350  
Jeremy McKenzie  
OK, so.

0:44:44.990 --> 0:44:57.210  
Jeremy McKenzie  
This is showing sort of before and after there are a number of iterative steps that I won't go through, but the we started with an initial model, which had basically.

0:44:58.30 --> 0:45:5.90  
Jeremy McKenzie  
Logistic see like Tivities on all selectivities that it was trying to estimate.

0:45:5.810 --> 0:45:20.590  
Jeremy McKenzie  
And then we moved into double normals and plateaus sort of see activities through the process. And so the as an example of of how the Fit sort of improved in the compositional data you can see this one for the.

0:45:21.870 --> 0:45:38.120  
Jeremy McKenzie  
Troll fishery I think illustrates that the improvement in the fit from the beginning to the end, so this is pretty standard across the sets. We were finding it was the set activity assumptions improved to fit which is what you'd expect.

0:45:39.150 --> 0:45:51.780  
Jeremy McKenzie  
Umm it changing the selectivity between the initial and the final model didn't really affect the improve the fit to the CPUE very much the the pets were very good.

0:45:52.730 --> 0:46:7.50  
Jeremy McKenzie  
Umm, which is which we'll talk about later is largely due there's a huge number of recruitment deaf. You've got the models got the freedom to estimate but there wasn't much difference between the final and the initial model and the CPUE puts.

0:46:7.840 --> 0:46:8.930  
Jeremy McKenzie  
The long line data.

0:46:9.870 --> 0:46:18.240  
Jeremy McKenzie  
And if you're looking at residuals uh between the initial the final and the after the Francis Reweighting.

0:46:18.970 --> 0:46:32.60  
Jeremy McKenzie  
They all look reasonably good, and there's a little bit of sort of up and down. But basically there's not much. There's no real strong evidence of a temporal pattern and they're distributed above and below the.

0:46:33.80 --> 0:46:39.130  
Jeremy McKenzie  
The The Zero line so you, you would probably be happy with this in a in an assessment context.

0:46:41.140 --> 0:46:46.890  
Jeremy McKenzie  
Umm that's just to show how the selectivities varied from the start to the to the end.

0:46:47.970 --> 0:46:50.640  
Jeremy McKenzie  
With various fisheries to improve the flats.

0:46:53.180 --> 0:47:2.890  
Jeremy McKenzie  
And these are the final sort of model productions on the CSV's the actual CSV's on the right and the percent.

0:47:3.750 --> 0:47:11.240  
Jeremy McKenzie  
B0 productions on the on the left, which is pretty much how in New Zealand views fisheries in terms of reference points.

0:47:12.40 --> 0:47:15.840  
Jeremy McKenzie  
Umm so the the initial model was.

0:47:16.430 --> 0:47:24.970  
Jeremy McKenzie  
Quite different to the file and Reweighted models in terms of stock assessment advice so make quite a.

0:47:25.660 --> 0:47:33.770  
Jeremy McKenzie  
A significant difference in our productions on stock status by changing the selectivity assumptions and proving that that to the to the length data.

0:47:35.740 --> 0:47:36.360  
Jeremy McKenzie  
However.

0:47:36.440 --> 0:47:43.270  
Jeremy McKenzie  
Umm what we see in the final results suggest that there are some issues.

0:47:43.350 --> 0:47:45.800  
Jeremy McKenzie  
Umm this is the.

0:47:51.710 --> 0:47:52.160  
Teresa A'mar  
Yes.

0:47:47.50 --> 0:48:17.230  
Jeremy McKenzie  
And thinking Teresa This is a long line is it? Which one of our our our data sets, which shows strong bimodality and you'd see you see bimodality and and the other sets as well. That's was just an illustration of what we saw so you whatever we did with the selectivity and the single area model. It wasn't dealing with zada affected by modality and and by the way. These are totally. These are aggregated I've got all observations for this fisheries so there's no.

0:48:17.930 --> 0:48:42.680  
Jeremy McKenzie  
His team curly egg guided so he's the looks so smooth, but by the way. But the fact that you've got bimodality and Aggregated. Data is means you're not really capturing a dynamic in the in the fishery and it seems to be pointing to there's a these are by season so we split these out by season to see whether season specifically was might explain.

0:48:43.840 --> 0:48:53.970  
Jeremy McKenzie  
It and be be be something we would need to put in the future generation in the model if it if it if it could explain why we're seeing by modality, but it's present in all the seasoning regulated data.

0:48:55.480 --> 0:49:22.650  
Jeremy McKenzie  
And it sort of suggests that also that that there's possibly a not only season but likely spaces may be a problem as well. So we got to with this is that yeah, the model seems to perform you know in sort of General Diagnostics. But these patterns are not dealt with by a single area model, pointing to either season or space being an underlying problem that you might need to deal with in some way.

0:49:26.520 --> 0:49:27.220  
Jeremy McKenzie  
So.

0:49:30.820 --> 0:49:43.670  
Jeremy McKenzie  
Ah this is sorry this is an example of a link based result, so I'll go through this quickly. I'm sort of cognizant? How much time I'm going through here and that's you sort of get a lot of machine here, so the length based model performed.

0:49:44.330 --> 0:49:49.890  
Jeremy McKenzie  
Pretty similarly to the age based model, we had to make some.

0:49:50.520 --> 0:50:2.930  
Jeremy McKenzie  
Uh different specifications to keep the growth the way growth was being represented in the model and the models. Similar the product on the right shows the kind of Growth Dynamics.

0:50:4.270 --> 0:50:10.700  
Jeremy McKenzie  
In the model, which largely over at like 11 where you start to get into the observational data space.

0:50:11.420 --> 0:50:27.570  
Jeremy McKenzie  
Umm the productions are very, very similar slightly lower. SSB and the and B0. But percent B0 pretty similar. So you would there's not much to distinguish between the performance of these models.

0:50:28.450 --> 0:50:51.680  
Jeremy McKenzie  
I was expecting it to be a bitter model and likelihood space, it, it on the graph on the right and left shows the fit to an example fit to the person data, which is one of the more rich data. So it's very similar fit. But the likelihood scores over the compositional data was slightly worse with the length based model so.

0:50:52.180 --> 0:50:58.250  
Jeremy McKenzie  
Umm you know it's it's it's what it is there was an interesting exercise.

0:50:59.160 --> 0:50:59.690  
Jeremy McKenzie  
Umm.

0:51:0.650 --> 0:51:8.780  
Jeremy McKenzie  
So this is the pletzer areas model again. We assume the same biology diagnostics as before, like you comparisons.

0:51:9.420 --> 0:51:14.230  
Jeremy McKenzie  
Umm we could play around with both selectivities and queues in this model.

0:51:15.700 --> 0:51:24.130  
Jeremy McKenzie  
And then the last model was as before, when we got to the final model was was we could we, we waited with the finances we waiting approach.

0:51:25.50 --> 0:51:27.360  
Jeremy McKenzie  
So again some of our sort of outcomes.

0:51:28.480 --> 0:51:34.190  
Jeremy McKenzie  
It is an improvement in the fits when when playing around with the selectivities.

0:51:35.0 --> 0:51:35.460  
Jeremy McKenzie  
Uh.

0:51:37.210 --> 0:51:52.40  
Jeremy McKenzie  
He been we, we saw still spatial well evidence of of of non fit with the single area flexes areas model and that it's still got by modality.

0:51:52.760 --> 0:52:8.930  
Jeremy McKenzie  
Issues and so you'd still be concerned about this model. It's probably doing a slightly better job at fitting to the compositional data cause. It's got more parameterizations to deal with spatial complexity, but there are still underlying issues that we'd be concerned about.

0:52:11.390 --> 0:52:13.820  
Jeremy McKenzie  
This is the fits to the.

0:52:14.590 --> 0:52:22.810  
Jeremy McKenzie  
CPUE series, so these are now split out the four area fleets for the long line the initial model.

0:52:23.760 --> 0:52:33.140  
Jeremy McKenzie  
I wasn't doing very well, whereas when you remember that in the other model. Both the final and initial sort of fitted the CPUE fine.

0:52:33.680 --> 0:52:43.730  
Jeremy McKenzie  
Umm this one improves the Fit as you move manipulated the selectivity so you do improve the fit, we needed before.

0:52:44.420 --> 0:52:50.40  
Jeremy McKenzie  
Uh I'm just gonna say something about the cues uh we found that.

0:52:51.100 --> 0:53:3.810  
Jeremy McKenzie  
More plausible results in terms of selectivities that were obtained when we used multiple queues and not a global queue because the the model just traded off selectivity when it.

0:53:3.960 --> 0:53:19.830  
Jeremy McKenzie  
You can talk catchability when it when the when the queues were faxed at a single value and gave and we had to use very unrealistic. Selectivity predicted very unrealistic. Selectivities just because it needed to do that to to to count for a constant queue so.

0:53:21.90 --> 0:53:50.120  
Jeremy McKenzie  
The the more defensible model is multiple queue, but honestly the results are in terms of productions and and diagnostics for identical between whether you use multiple queues or or global queue and let's selectivity absorb the catchability differences, so I just point that out, I'm not showing that here, but that's what we found I guess it's more of a concern as regardless of with you and global cues or or fix separate queues.

0:53:50.280 --> 0:53:51.840  
Jeremy McKenzie  
These were common.

0:53:52.530 --> 0:54:2.490  
Jeremy McKenzie  
So there's a there's certainly a evidence of some temporal change in catchability quickly in the long line fishery area 1.

0:54:3.140 --> 0:54:14.380  
Jeremy McKenzie  
That would be of concern and the residual diagnostics on this CPUE spatially disaggregated CPUE are are are concerned.

0:54:16.620 --> 0:54:19.530  
Jeremy McKenzie  
And again this is sort of the outcome.

0:54:20.890 --> 0:54:21.700  
Jeremy McKenzie  
Once you

0:54:22.580 --> 0:54:26.410  
Jeremy McKenzie  
Umm I got to the final model you.

0:54:27.400 --> 0:54:41.880  
Jeremy McKenzie  
There's a quite a big difference between the initial model and the final model predictions of stock status and and outcome that the reweighted model and the unrelated model final models that are closer than they were in the other.

0:54:43.40 --> 0:54:44.170  
Jeremy McKenzie  
Other assessment model.

0:54:46.100 --> 0:54:55.770  
Jeremy McKenzie  
Umm so I'm getting to the end of this we're we would consider next steps would be splitting the CPUE time series to account for?

0:54:56.470 --> 0:55:2.40  
Jeremy McKenzie  
Possible changes in Catchability That's where we would sort of be going up with the single the single area approaches.

0:55:3.60 --> 0:55:11.170  
Jeremy McKenzie  
Umm we would look at, I think adding season dimension and in particularly into the fleets as areas model.

0:55:12.780 --> 0:55:16.70  
Jeremy McKenzie  
Sort of to try and tease out seasonal area interaction.

0:55:17.80 --> 0:55:33.840  
Jeremy McKenzie  
Umm we yeah, we would be wanting to move the model into a true annual model with four explicit time steps, which I pointed out castle. Two can deal with it was initially a limitation with the Casal. One when we started but we can cope with that with Casal 2.

0:55:34.800 --> 0:55:38.710  
Jeremy McKenzie  
And you know, we suspect that the current.

0:55:40.120 --> 0:55:45.570  
Jeremy McKenzie  
Uh model is well over parameterized in terms of recruitment dibs.

0:55:46.470 --> 0:55:48.500  
Jeremy McKenzie  
Umm and

0:55:50.110 --> 0:55:53.80  
Jeremy McKenzie  
the the fact that the model can fit very good.

0:55:54.10 --> 0:55:56.90  
Jeremy McKenzie  
CPUE or despite the sort of.

0:55:57.470 --> 0:56:7.230  
Jeremy McKenzie  
Screens in it, I mean, it manages capture there are a lot of the dynamics and shifts ups and downs, and the CPU which is totally because we've got the freedom with the year Clusterings to do that and.

0:56:8.90 --> 0:56:31.300  
Jeremy McKenzie  
Umm you know, we would question that the compositional data is got the the resolving power to actually really tell you much about your clustering so that degree. So where we would be going next would be to look at turning down that data and seeing how sensitive it. It is to to list observational you know parameterization and in that space.

0:56:32.880 --> 0:56:33.480  
Jeremy McKenzie  
Umm.

0:56:35.360 --> 0:56:45.50  
Jeremy McKenzie  
So I guess we were at with this we, we, we, as I said, we, we, we ran out of the ability to to get the the poorer model which you would like to sort of bring into the mix, we could.

0:56:46.130 --> 0:57:3.560  
Jeremy McKenzie  
But if we were doing assessments of this, I guess we use the term pass muster, but it would be problematic. We wouldn't get either of those assessments through a working group in New Zealand. They would have issues with the Misfits and the compositional space and then they?

0:57:4.240 --> 0:57:11.220  
Jeremy McKenzie  
And certainly with the CPUE indices. We we would need to do more work. If that was to be an assessment there would be accepted.

0:57:11.930 --> 0:57:12.570  
Jeremy McKenzie  
Umm.

0:57:14.900 --> 0:57:28.130  
Jeremy McKenzie  
Yeah, they composition, the fleet of the areas model, UM is is seems to be slightly better than to filling the compositional as you'd expect because it's got more power, but it's still it's still has underlying issues.

0:57:31.350 --> 0:57:32.120  
Jeremy McKenzie  
Yeah.

0:57:34.660 --> 0:57:37.840  
Jeremy McKenzie  
So I just uh just give a a brief.

0:57:38.620 --> 0:57:53.510  
Jeremy McKenzie  
Charlotte and tell of the 100 iterations that we ran with the single area model by and large it's it's looks reasonable that's gave us.

0:57:54.300 --> 0:57:55.620  
Jeremy McKenzie  
They they sort of.

0:57:56.350 --> 0:58:2.900  
Jeremy McKenzie  
Basically show uh a similar pattern, Umm I should expect with some variability given.

0:58:3.620 --> 0:58:10.390  
Jeremy McKenzie  
The the the observational error that's in the in the simulator data sets, but reasonably well behaved.

0:58:11.80 --> 0:58:18.20  
Jeremy McKenzie  
In terms of uh a stability around what each of the models where each of the runs were predicting.

0:58:19.890 --> 0:58:24.400  
Jeremy McKenzie  
That's what the distributions of the some of the key parameters look like.

0:58:27.140 --> 0:58:30.670  
Jeremy McKenzie  
Yeah, we, we felt that that was kind of reasonable given.

0:58:32.220 --> 0:58:34.510  
Jeremy McKenzie  
Given the nature and the variability and the data.

0:58:36.300 --> 0:58:44.390  
Jeremy McKenzie  
Uh so that's the end of my our presentation. Some acknowledgments definitely acknowledgements to New Zealand Fisheries, New Zealand, who.

0:58:45.190 --> 0:58:58.140  
Jeremy McKenzie  
Ashley funded this work and it's been very supportive of this work. You know, and the Indian Ocean Tuna Commission is also acknowledged here because they were they've been very supportive as well. This work OK.

0:58:59.570 --> 0:59:0.140  
Jeremy McKenzie  
That's us.

0:59:4.620 --> 0:59:24.470  
Aaron Berger (Guest)  
All right thanks very much. Jeremy the First off you know, no apologies at all necessary about not getting as far as you had liked you know, I think that's the nature of the beast with spatial assessment models. They take a long time to really work through especially in this case, where you have seasonality as well as you described.

0:59:25.880 --> 0:59:27.750  
Aaron Berger (Guest)  
So thank you very much for your presentation.

0:59:28.250 --> 0:59:36.810  
Aaron Berger (Guest)  
Umm we have plenty of time for questions for Jeremy or the castle team.

0:59:41.100 --> 0:59:43.300  
Aaron Berger (Guest)  
So again you can either use the raise hand feature.

0:59:45.260 --> 0:59:47.310  
Aaron Berger (Guest)  
Or type in a question that chat.

0:59:59.950 --> 1:0:2.320  
Jeremy McKenzie  
Then silence there, Uh Aaron.

1:0:4.960 --> 1:0:9.230  
Aaron Berger (Guest)  
Well let's see I've got we've got a question let's start with Dan.

1:0:11.150 --> 1:0:13.920  
Aaron Berger (Guest)  
Go ahead and unmute and you can ask your question devo.

1:0:19.890 --> 1:0:20.520  
Jeremy McKenzie  
Uh Dan.

1:0:16.220 --> 1:0:22.140  
Fu, Dan (NFITD)  
And I Jeremy and thanks for the presentation and also you will hear from you.

1:0:23.440 --> 1:0:27.130  
Fu, Dan (NFITD)  
A quick question could you clarify what's the?

1:0:28.380 --> 1:0:32.750  
Fu, Dan (NFITD)  
The units or the the scale of your estimates so basis.

1:0:32.800 --> 1:0:33.40  
Fu, Dan (NFITD)  
E.

1:0:33.920 --> 1:0:38.710  
Fu, Dan (NFITD)  
On those plots, it seems to be that they're estimated around the wrong.

1:0:39.980 --> 1:0:42.540  
Fu, Dan (NFITD)  
40 S 400,000 tons.

1:0:43.510 --> 1:0:44.720  
Fu, Dan (NFITD)  
And that seems to be.

1:0:43.460 --> 1:0:52.930  
Jeremy McKenzie  
That's a good question. I'm gonna I'm gonna pass that to Teresa Cause Yeah. I we must apologize some of these graphs are pretty hard to.

1:0:54.70 --> 1:0:59.660  
Jeremy McKenzie  
To to read Teresa can you clarify what the scale of that is.

1:1:0.180 --> 1:1:23.990  
Teresa A'mar  
Yeah, I think I think Dan's correct that is around 350, four 100,000 tons. I think that was in one of the figures when you're just showing the the parameter distributions for over the 100 datasets on the left upper right upper left hand corner was B0 and B0 was, I think yeah, and then 200, and 6200 and 50,000 with about the median.

1:1:25.290 --> 1:1:26.620  
Teresa A'mar  
But yeah, that's metric tons.

1:1:28.270 --> 1:1:48.970  
Fu, Dan (NFITD)  
It it do you get those uh that kind of scale across all the models around you did, including the single area and the The Fleetest area models as it seems to be a bit lost to me because so those catches are around the the peak of the catches around about 400,000 tons if I'm remember correctly.

1:1:49.690 --> 1:1:55.440  
Fu, Dan (NFITD)  
So that seems to be a bit low to me if that's something you have looked at.

1:1:56.730 --> 1:1:59.70  
Fu, Dan (NFITD)  
Uh yeah, and that's yeah.

1:1:57.180 --> 1:2:13.540  
Teresa A'mar  
Uh not not specifically for that particular issue. This is this is specifically for the single area models. But that wasn't anything that came up in the diagnostics as something that we needed to look further at but but we can make a note to look at that in the development of the next version, so these models.

1:2:14.680 --> 1:2:15.860  
Jeremy McKenzie  
That's a good point.

1:2:17.220 --> 1:2:24.790  
Jeremy McKenzie  
Just just on that Aaron I mean, none of us know the truth. But the truth is actually known.

1:2:25.670 --> 1:2:40.670  
Jeremy McKenzie  
Umm I mean are you planning at the uh as a sort of a big reveal thing as I mean, it would be useful to know at some point when everybody's done their work, possibly at the main workshop. Just you know root mean square error coming over.

1:2:41.830 --> 1:2:52.990  
Jeremy McKenzie  
An interpretation, but yeah, I'm I'm I'll be interested to know what? What what your thoughts are about how we interpret the truth relative to what we've all predicted.

1:2:55.60 --> 1:2:59.820  
Aaron Berger (Guest)  
Yeah, sure I think you know our our our main goal here is to.

1:3:0.920 --> 1:3:13.130  
Aaron Berger (Guest)  
Is to understand the process by? Which you developed your model and so right? That's a this? This decision point kind of analysis or data gathering information step.

1:3:14.430 --> 1:3:35.930  
Aaron Berger (Guest)  
That's really that's really the the the most important secondary to that is, is looking at kind of the comparisons, which you've showed here between your single area your fleets fleets as areas and you know your potential four area. I think that's the second really kind of step that we think is important to kind of look at kind of what you've done the process that you've done based on those decisions.

1:3:36.620 --> 1:3:58.640  
Aaron Berger (Guest)  
What are some of the differences by the spatial approach that you took and then kind of third and in tertiary to all of that is, is you know, comparing to truth. If you will because you're right on the one hand, you know this is based off of Indian Ocean Yellowfin Tuna. You can go to a recent assessment and get scale now our Simon.

1:3:58.810 --> 1:4:15.360  
Aaron Berger (Guest)  
For simulated data is based off of that, but not exactly the same, so I you could do that to get an idea of scale. But the quote UN quote Truth in our simulations will be different than than what is in the the assessment used for management advice?

1:4:17.10 --> 1:4:35.820  
Aaron Berger (Guest)  
In terms of providing the truth. We're more than happy to do that. We were kind of from a process standpoint gonna get through the webinars and that was going to be part of the kind of discussion and lead up to the in person workshop because we really wanted these webinars to focus on those first two objectives.

1:4:36.420 --> 1:4:39.290  
Aaron Berger (Guest)  
Umm you know, but if any individual team.

1:4:40.20 --> 1:4:48.430  
Aaron Berger (Guest)  
After presenting once the the you know the the true underlining parameters and things like that. That's not something that we're we're hiding or anything like that.

1:4:51.670 --> 1:4:52.470  
Aaron Berger (Guest)  
Does that help Jeremy?

1:4:52.900 --> 1:5:6.170  
Jeremy McKenzie  
Yeah, it does, I I think it's it's gonna be interesting to see how the different teams. You know what? What they what the various Mel modern platforms are predict.

1:5:6.870 --> 1:5:13.480  
Jeremy McKenzie  
Uh for the same data and then how that it does vary against the the underlying reality.

1:5:13.560 --> 1:5:34.800  
Jeremy McKenzie  
Yeah, but yeah, as you said as you point out that the the the truth is not necessarily the point of this. It's it's what how we went about thinking about setting it up and how our is modelling platforms can can accommodate to greater or lesser degrees. Spatial spatial and temporal complexity so there's a number of things going on and what we're trying to achieve.

1:5:37.360 --> 1:5:37.860  
Aaron Berger (Guest)  
Yeah.

1:5:38.460 --> 1:5:42.440  
Aaron Berger (Guest)  
Yeah, thanks. Jeremy we do have a a comment in the chat from Mark.

1:5:42.900 --> 1:5:53.910  
Aaron Berger (Guest)  
Umm I'll go ahead and read it, but Jeremy If you can see the chat. You may want to read along yes? Can you explain the global catchability in the areas as fisheries approach?

1:5:54.690 --> 1:6:0.320  
Aaron Berger (Guest)  
The CPUE of each fishery is a measure of the whole population as modified by the selectivity.

1:6:1.10 --> 1:6:12.820  
Aaron Berger (Guest)  
Because each area is a different fraction of the population and probably has different densities. So catchability is expected to be different, and that's in the chat there if it if it's helpful to read that.

1:6:13.560 --> 1:6:14.980  
Jeremy McKenzie  
Yeah, I I it's

1:6:15.720 --> 1:6:36.810  
Jeremy McKenzie  
it's totally yeah, yeah that that's that's the reality of of the the different indices that they're they're implicitly got different. Either Selectivities or capabilities. Otherwise, you only need one index. So they're they're they're they're referencing some in proxying for space in this model, but the fact that you.

1:6:37.540 --> 1:6:38.630  
Jeremy McKenzie  
Even in a

1:6:39.480 --> 1:6:46.890  
Jeremy McKenzie  
in a single area model if you had different indices that had different aspects about them you can.

1:6:47.780 --> 1:7:1.890  
Jeremy McKenzie  
Which relate to and overall catchability you know catchability in our models can be constructed by having a queue or a selectivity generally all indices. We put in models have selectivity that you have to provide it.

1:7:3.190 --> 1:7:18.110  
Jeremy McKenzie  
So they they are coral heavily correlated and what we found is that if we fixed the queue and said the queues on all those fisheries are the same then the only way that the model can accommodate differences in the in the in the signals due to.

1:7:19.0 --> 1:7:36.430  
Jeremy McKenzie  
You know, obviously acting in different parts of the stock was to play with the selectivities because it you didn't give it any other freedom and if you relaxed that and said Well, you can change the queues, then what happened was the selectivities sort of came into more of a similar space. Certainly.

1:7:37.800 --> 1:7:43.130  
Jeremy McKenzie  
What what it needed to do I haven't shown it was actually have a plateau at at not at 1?

1:7:44.120 --> 1:7:50.650  
Jeremy McKenzie  
And for some of the fisheries to to say that well. You're not seeing all the population. Even when you're you're you're maximally selecting it.

1:7:51.320 --> 1:7:59.370  
Jeremy McKenzie  
Which is called a kind of a bit counter intuitive and not looked at that silly but it it? It had the same effect of multiple queues so.

1:8:0.710 --> 1:8:4.280  
Jeremy McKenzie  
Either way, the the the the results and fits with the same.

1:8:4.880 --> 1:8:8.630  
Jeremy McKenzie  
Umm it just was trading off I said a parameters for another.

1:8:10.360 --> 1:8:11.110  
Jeremy McKenzie  
That makes sense.

1:8:16.140 --> 1:8:21.70  
Simon Hoyle  
Can I just jump in and respond to that as well? I'm trying to turn my camera on but oh there, you go.

1:8:21.650 --> 1:8:22.20  
Simon Hoyle  
I'm

1:8:24.520 --> 1:8:25.100  
Simon Hoyle  
when.

1:8:26.0 --> 1:8:32.650  
Simon Hoyle  
Like I did this CPUE analysis and set up the CPUE and I adjusted them.

1:8:34.140 --> 1:8:34.610  
Simon Hoyle  
So that

1:8:35.280 --> 1:8:40.90  
Simon Hoyle  
in theory, the I I use the area, waiting approach and so I Reweighted.

1:8:41.110 --> 1:8:42.360  
Simon Hoyle  
H CPUE so.

1:8:43.240 --> 1:8:50.570  
Simon Hoyle  
To account for the the biomass within each area in the SPM simulation so in theory, the.

1:8:51.890 --> 1:9:4.130  
Simon Hoyle  
The CPU we the catchability should have been the same alright you should have been in a in a perfect world in up with the perfect model, it would be reasonable to assume the same.

1:9:5.170 --> 1:9:9.540  
Simon Hoyle  
See the same catchability for each longline fishery and each area.

1:9:11.200 --> 1:9:22.70  
Simon Hoyle  
The fact that that isn't really working is is interesting in itself. But that's kind of responding to Marc's suggestion that the the capabilities were adjusted the CPUE.

1:9:24.160 --> 1:9:29.230  
Simon Hoyle  
Indices that were provided for each area where adjusted so that in theory.

1:9:30.100 --> 1:9:36.110  
Simon Hoyle  
In a perfect model, you should be able to assume constant catchability and not break the model.

1:9:38.270 --> 1:9:38.760  
Simon Hoyle  
Yeah.

1:9:39.580 --> 1:9:42.730  
Jeremy McKenzie  
Yeah, well the only way to do that was to.

1:9:43.500 --> 1:9:50.790  
Jeremy McKenzie  
Adjust the selectivities in a way that was really not plausible. But it that's what it needed to do to make it work.

1:9:53.930 --> 1:10:2.0  
Jeremy McKenzie  
In lightweight structured before area fleets of the areas model. Whether that's pointing to underlying model misspecification or not, that's what happened.

1:10:16.10 --> 1:10:16.380  
Aaron Berger (Guest)  
Yeah.

1:10:15.510 --> 1:10:16.760  
Dan (Guest)  
So this is Dan.

1:10:18.920 --> 1:10:25.650  
Dan (Guest)  
Yeah, great. I like the presentation that was great and it was really informative to see you know, kind of that step by step process.

1:10:26.780 --> 1:10:32.780  
Dan (Guest)  
I thought was really interesting when you guys really started to pick up on that by modality and the compositional data.

1:10:33.240 --> 1:10:52.70  
Dan (Guest)  
Umm I was just wondering you know if you could kind of talk about that. A little bit more in terms of you know are you planning to use that sort of kind of residual analysis and data fit to inform how you go about the spatial model in the future.

1:10:52.960 --> 1:11:1.30  
Jeremy McKenzie  
Yeah, I'm going to say we would, the natural step. It would be something definitely in the thought process that you're trying to.

1:11:2.220 --> 1:11:6.190  
Jeremy McKenzie  
Account for in a more spatially explicit model.

1:11:7.320 --> 1:11:23.710  
Jeremy McKenzie  
So I mean, you just working with these models to till you start seeing things that aren't of concern or pointing to process error in your residual space of your observational data but yeah, definitely we would be.

1:11:24.90 --> 1:11:45.90  
Jeremy McKenzie  
Umm we've already sort of indicated season that something that that that needs to be in there and obviously space as well. That does seem to be an interaction between the two. It's not just fixing the spatial dynamics of the CSMA and it's dealing with the temporal dynamics. The you have got a particularly that number area 1 long line.

1:11:45.830 --> 1:11:51.480  
Jeremy McKenzie  
Umm is showing CPUE is showing but the evidence of the changing.

1:11:52.240 --> 1:12:22.150  
Jeremy McKenzie  
Some well the way it's structured showing catchability changing over time that the the residual patterns aren't great. But it's it's it's got a trend that's through through time based so yeah, yeah, we would be focusing on on trying to get out features like that by modality and and and in the next iteration, which goes which the spatial model gives us more power to deal with things like that. But we'd certainly want to be dealing with temporal things as well, we, we, we're not so we're happy with.

1:12:22.220 --> 1:12:24.820  
Jeremy McKenzie  
With that aspect of the of the assessment.

1:12:39.900 --> 1:12:41.120  
Aaron Berger (Guest)  
OK other questions.

1:12:51.200 --> 1:12:52.730  
Aaron Berger (Guest)  
I guess Jeremy I'll I'll ask one.

1:12:54.10 --> 1:12:56.10  
Aaron Berger (Guest)  
I was wondering at the beginning, you said.

1:12:56.750 --> 1:13:8.500  
Aaron Berger (Guest)  
Or mentioned that you, you guys did not use the tagging data in the single area model because it didn't seem informative. I forget the word you use informative or representative.

1:13:9.240 --> 1:13:24.180  
Aaron Berger (Guest)  
Umm and so that's kind of a you know, maybe database or first principles based reasoning and and it's completely reasonable thing to say, but I was wondering if there you know what?

1:13:25.410 --> 1:13:27.360  
Aaron Berger (Guest)  
Are there things that could have been done?

1:13:28.350 --> 1:13:36.240  
Aaron Berger (Guest)  
Either available in castle or things that could have been done. Maybe that aren't available that might have led you to using that information.

1:13:37.350 --> 1:13:44.10  
Aaron Berger (Guest)  
And you know if so would that have maybe helped with even structuring of fleet's areas.

1:13:44.750 --> 1:13:48.960  
Aaron Berger (Guest)  
Model I mean, I guess I'm saying even if you don't use a spatially.

1:13:50.720 --> 1:13:52.360  
Jeremy McKenzie  
You took it specifically that.

1:13:50.200 --> 1:13:53.820  
Aaron Berger (Guest)  
You know tagging movement spatial area model, yeah, go ahead.

1:13:53.510 --> 1:13:56.720  
Jeremy McKenzie  
With something the tagging Dollar Erin or just generally.

1:13:57.160 --> 1:13:58.110  
Aaron Berger (Guest)  
No, the tagging data.

1:13:58.420 --> 1:13:59.960  
Jeremy McKenzie  
Yeah, I'm I mean?

1:14:2.190 --> 1:14:6.410  
Jeremy McKenzie  
To tagging data is one of my things and I I.

1:14:7.610 --> 1:14:16.400  
Jeremy McKenzie  
For me the fact that you, you've got heterogeneity in the way those tags are gone out on memory covered if you're jumping over a big area that's

1:14:17.50 --> 1:14:19.620  
Jeremy McKenzie  
to me that's problematic, and you're opening up all sorts of.

1:14:20.430 --> 1:14:39.530  
Jeremy McKenzie  
Uh questions from from scrutinises of your work to say, Well, you, yeah, dealing with spatial heterogeneity and and that could be driving. All sorts of things and you tagging data and causing your model to to interpret it in the wrong way. I mean, it's once you put tagging data in there, particularly like castle users very, very powerful on biomass.

1:14:40.440 --> 1:14:51.70  
Jeremy McKenzie  
It's it's a you know you gotta Peterson. Mark recapture underlying it and it's gonna say. I'm know the biomass because you've told me all the ingredients. I need to calculate at it so.

1:14:52.910 --> 1:15:3.540  
Jeremy McKenzie  
You I think you've gotta be very careful on on how you use tagging data in terms of the underlying assumptions about how how it's you know the homogeneity assumptions are very easily violated.

1:15:4.790 --> 1:15:25.820  
Jeremy McKenzie  
We were We are or would like to consider using the tagging data. When we've got the force for the specific areas because that that that enables you to report it sort of more formally account for spatial heterogeneity in terms of the way the tags are gone out. So yeah, the initial thought was Don't use it for the global models.

1:15:33.670 --> 1:15:33.890  
Aaron Berger (Guest)  
Yeah.

1:15:34.810 --> 1:15:35.830  
Aaron Berger (Guest)  
OK thanks Jeremy.

1:15:39.540 --> 1:15:41.830  
Aaron Berger (Guest)  
We got a couple more minutes if there's other questions.

1:15:45.130 --> 1:15:48.20  
Aaron Berger (Guest)  
This will be my notice to haikun that you're you're on deck shortly.

1:16:10.330 --> 1:16:11.410  
Aaron Berger (Guest)  
Alright well, seeing none.

1:16:13.570 --> 1:16:13.840  
Aaron Berger (Guest)  
Yep.

1:16:12.160 --> 1:16:16.40  
Dan (Guest)  
Uh Aaron Carolina has a has a hand up, she might have a question.

1:16:15.320 --> 1:16:18.110  
Aaron Berger (Guest)  
Oh, thank you yes go ahead.

1:16:20.310 --> 1:16:24.760  
Carolina Minte-Vera  
Thank you, it's just a clarification. I think maybe I had a

1:16:25.630 --> 1:16:28.780  
Carolina Minte-Vera  
a lapse of concentration there, but I didn't I don't.

1:16:29.620 --> 1:16:39.90  
Carolina Minte-Vera  
Have it clear how you choose your four areas. If it were the proposed areas or you had a a a way to compose in those in space.

1:16:40.250 --> 1:16:40.910  
Jeremy McKenzie  
Uh.

1:16:41.620 --> 1:16:53.320  
Jeremy McKenzie  
Good Chris and I to my through the Teresa cause. This is the Fourier is specifically the lines on the water for the four areas relate to the four area model, which we haven't shown today.

1:16:54.600 --> 1:16:56.590  
Jeremy McKenzie  
The fleets of the areas approach is just.

1:16:56.670 --> 1:16:57.240  
Jeremy McKenzie  
Uh.

1:16:58.830 --> 1:17:4.560  
Jeremy McKenzie  
Exactly that, so you, you, your data is just aggregated by fleet and.

1:17:5.380 --> 1:17:13.750  
Jeremy McKenzie  
You they proxying for for an area I. I think that area, those area decisions from memory are are are provided.

1:17:13.970 --> 1:17:16.80  
Jeremy McKenzie  
And it

1:17:15.290 --> 1:17:16.830  
Teresa A'mar  
Yeah, that that's correct Jeremy.

1:17:18.120 --> 1:17:18.550  
Jeremy McKenzie  
yeah.

1:17:22.310 --> 1:17:23.440  
Carolina Minte-Vera  
OK thanks.

1:17:27.350 --> 1:17:35.520  
Aaron Berger (Guest)  
You're we have another question in the chat for you. Could you explain why the performance of the model was better with the age based model?

1:17:36.900 --> 1:17:43.900  
Jeremy McKenzie  
Yeah, I I I didn't know I'd like to know and I'd like to explore it a bit more because I'm I'm I'm really don't like.

1:17:45.20 --> 1:18:11.820  
Jeremy McKenzie  
I was the one that did we should be own age links based all along. You know the The The The This is all the observational datas and length. It's totally set up to do to be a length based model. You're implying things, adding additional this is my voice, adding additional complication by adding explicit age dynamics and having the main structure of the model being fundamentally converting everything back to age why do it?

1:18:12.440 --> 1:18:14.710  
Jeremy McKenzie  
Umm and it just.

1:18:15.860 --> 1:18:31.210  
Jeremy McKenzie  
Wasn't as good but I mean? We didn't have a real lot of time to play around one of the things that I had to do to make the length based model work was a bit of a fudge because the the length data. I'm trying to remember isn't fully.

1:18:32.590 --> 1:18:38.140  
Jeremy McKenzie  
The way it's provided it's in sort of like 5 centimetre into integrals intervals.

1:18:39.130 --> 1:18:58.410  
Jeremy McKenzie  
From memory and so when you set up the length based model, it needs to have all the colour between like not just 3035 but 3031323334 so the way I did it was was sort of Fudge. There, a bit and I won't explain how and I had to change the.

1:18:59.490 --> 1:19:2.570  
Jeremy McKenzie  
The growth model a little bit to to make it work.

1:19:4.40 --> 1:19:22.20  
Jeremy McKenzie  
And and then the length weight relationships to make it work, so there was a bit of abstraction that went on that got them similar, but it could be accounting for some of the poor fit in the length based model. I would suggest if it was me, I'd be exploring that a lot more.

1:19:24.360 --> 1:19:26.140  
Jeremy McKenzie  
But I I yeah.

1:19:37.670 --> 1:19:49.990  
Aaron Berger (Guest)  
OK thanks Jeremy and you know, we're gonna have an open discussion time at the end of this webinar as well. So if if things come up you'll have time to to ask them again later.

1:19:51.820 --> 1:20:5.530  
Aaron Berger (Guest)  
I was thinking before we get started and we've already been here for a little while, but let's take a 5 or 6 minute bio break or get up and stretch? What have you and we'll start?

1:20:7.10 --> 1:20:10.550  
Aaron Berger (Guest)  
With your presentation haikun in about 5 minutes.

1:20:11.370 --> 1:20:12.640  
Aaron Berger (Guest)  
See all them thanks.

1:26:15.20 --> 1:26:17.710  
Aaron Berger (Guest)  
OK Haikun are you there, you hear me OK.

1:26:25.690 --> 1:26:26.580  
Haikun Xu  
Can you hear me now?

1:26:27.120 --> 1:26:31.220  
Aaron Berger (Guest)  
OK Yep there, you are great you can start sharing if you like.

1:26:32.80 --> 1:26:32.910  
Haikun Xu  
I have.

1:26:31.900 --> 1:26:33.750  
Aaron Berger (Guest)  
Alright everybody we're oh go ahead.

1:26:33.690 --> 1:26:37.900  
Haikun Xu  
I think I I have uh share my screen can can you see it?

1:26:38.400 --> 1:26:43.890  
Aaron Berger (Guest)  
Oh, yes, I can see it, Yep and you can go to your.

1:26:44.150 --> 1:26:46.10  
Aaron Berger (Guest)  
Isn't station mode?

1:26:50.220 --> 1:26:51.430  
Aaron Berger (Guest)  
There perfect.

1:26:52.320 --> 1:26:55.490  
Aaron Berger (Guest)  
OK, yeah, welcome back everybody we're gonna get started again.

1:26:56.150 --> 1:26:59.860  
Aaron Berger (Guest)  
Umm I have the privilege of introducing haikun zoo.

1:27:1.560 --> 1:27:6.720  
Aaron Berger (Guest)  
Who is A stock assessment scientist at the Inter American tropical tuna Commission?

1:27:7.560 --> 1:27:30.70  
Aaron Berger (Guest)  
He joined the IATTC Stock Assessment Group. In 2018 and has been mainly responsible for conducting the assessment of Big Ituna in the eastern Pacific Ocean is research interest is currently focused on stock assessment methodology and using spatial temporal models to to standardized cpue and compositional data.

1:27:31.150 --> 1:27:38.610  
Aaron Berger (Guest)  
Umm and Haikun is joined with a couple of others from the ITC Carolina and Mark.

1:27:39.320 --> 1:27:39.890  
Aaron Berger (Guest)  
Umm.

1:27:40.600 --> 1:27:44.670  
Aaron Berger (Guest)  
And yeah take it away Haikun Thanks for being here.

1:27:46.810 --> 1:28:0.870  
Haikun Xu  
But hello everyone and thank you. Aaron for the for the introduction and today I will present. IDC's preliminary results of the simulation spatial simulation experiments for Indian Ocean yellowfin.

1:28:3.850 --> 1:28:13.180  
Haikun Xu  
And so the outline of this presentation basically follows the analytical guidance. The first I would give every brief introduction to our method, which is followed.

1:28:13.890 --> 1:28:26.680  
Haikun Xu  
Buy a progress update then I will talk about the two most important parts of this presentation. The decision point analysis regarding how to prepare data and how to set up our model.

1:28:28.580 --> 1:28:37.0  
Haikun Xu  
And after that, I will show more results more results and more diagnostics using the single replicate.

1:28:37.760 --> 1:28:38.800  
Haikun Xu  
And after that.

1:28:39.890 --> 1:28:45.100  
Haikun Xu  
We spent the more feeding also to the other 99 replicates.

1:28:46.150 --> 1:28:49.760  
Haikun Xu  
In order to get ansamble results and finally.

1:28:50.500 --> 1:28:52.950  
Haikun Xu  
Ohh it's a discussion for discussion.

1:28:57.320 --> 1:29:14.210  
Haikun Xu  
Of before throwing any results first song to we want to say thank Doc Nicer's of this spatial simulation experiment. They provided a great opportunity for stock staffers successors worldwide to evaluate and compare different sets of approaches.

1:29:14.880 --> 1:29:15.650  
Haikun Xu  
And this.

1:29:16.730 --> 1:29:25.930  
Haikun Xu  
This uh experiment needs large amount of hard work on them to like example building codes communication and collaboration so.

1:29:26.960 --> 1:29:30.670  
Haikun Xu  
Thank you for your hard work to make this workshop possible.

1:29:33.810 --> 1:29:34.360  
Haikun Xu  
Uh.

1:29:35.270 --> 1:29:42.300  
Haikun Xu  
For I but IDC team we use stop seeing this as a assessment platform.

1:29:44.30 --> 1:29:52.310  
Haikun Xu  
And we use VAST as a platform to standardize the index abundance and The Associated desk conditions.

1:29:53.240 --> 1:29:57.530  
Haikun Xu  
And for the stock since his approach, we use errors of date.

1:30:1.190 --> 1:30:19.860  
Haikun Xu  
So we feed a single stock absence model to the simulated datasets for any ocean yellowfin and in particular. We use the older version as as 3.24 because it is consistent with the version of the access data, the workshop provides.

1:30:22.560 --> 1:30:34.470  
Haikun Xu  
And this is not a spatially structured such model so it ignores all simulated tagging data and uses an error surface proach to deal with spatially varying specially selectivity.

1:30:37.720 --> 1:31:2.460  
Haikun Xu  
That's model includes a number of fishery fleets and one service bit service. Fleet is a term in substances, referring to a fleet that can that fleet fleet that takes no catch from the from that region but it includes some useful data example. But on this index and conversations.

1:31:5.360 --> 1:31:8.790  
Haikun Xu  
Well. Sorry. Please it's added to the model to reflect.

1:31:9.730 --> 1:31:15.240  
Haikun Xu  
The abundance and that conversations at the population level for the entire Indian Ocean.

1:31:15.990 --> 1:31:25.140  
Haikun Xu  
Yellow ping and in particular, we use VAST to fit separately to sell level longline CPUE and that condition data.

1:31:26.220 --> 1:31:27.130  
Haikun Xu  
Simulate it.

1:31:28.360 --> 1:31:29.910  
Haikun Xu  
For the entire Indian Ocean.

1:31:31.280 --> 1:31:39.130  
Haikun Xu  
And VAST generates error waiting standardized abundance index, and associate them less conditions for the service right.

1:31:41.490 --> 1:31:44.490  
Haikun Xu  
So they felt it, it's all the surface is a long line fleet.

1:31:47.690 --> 1:31:58.480  
Haikun Xu  
And the protein within moments of yellow being within in the ocean cannot be explicitly comfort because this is not a specially structure model.

1:31:59.200 --> 1:32:8.640  
Haikun Xu  
But it can be implicitly comfort because the error weighted bounded index and less combinations for the survey are computed.

1:32:10.630 --> 1:32:15.380  
Haikun Xu  
Well, the entire in the ocean rather than for particular region so no matter.

1:32:16.180 --> 1:32:30.780  
Haikun Xu  
Hart appeals move within from one region to the next ring in the ocean. The Bond Index and let's condition error rate is so hopefully can deal with that, but this proach is limited by sampled quality of data.

1:32:31.910 --> 1:32:33.860  
Haikun Xu  
If the same will data sample.

1:32:34.550 --> 1:32:44.450  
Haikun Xu  
It's limited in space or special coverage changes over time. This matter may not work very well and I will talk about that in the discussion part.

1:32:47.920 --> 1:32:48.770  
Haikun Xu  
Where we are now?

1:32:49.570 --> 1:32:51.440  
Haikun Xu  
Uh so first we built.

1:32:53.60 --> 1:32:56.710  
Haikun Xu  
A set of 07 models and prepare the data.

1:32:57.530 --> 1:32:59.110  
Haikun Xu  
In the access format.

1:32:59.950 --> 1:33:0.740  
Haikun Xu  
And then we

1:33:1.400 --> 1:33:4.700  
Haikun Xu  
beat those small those to the single replicate and compare.

1:33:5.630 --> 1:33:13.950  
Haikun Xu  
Let me uh compare those models and do model diagnostics to make sure they fit well to a single replicate.

1:33:15.630 --> 1:33:19.680  
Haikun Xu  
After that, we expense analysis to the 100 replicates.

1:33:22.150 --> 1:33:26.400  
Haikun Xu  
This in other this give us a chance to summarize.

1:33:27.120 --> 1:33:32.620  
Haikun Xu  
The 100 case results has on ensemble by assessment model we?

1:33:33.420 --> 1:33:38.630  
Haikun Xu  
Automated soon but we divide the six models to compare among each other.

1:33:41.70 --> 1:33:47.360  
Haikun Xu  
And with the results from 100 replicates we can compare estimated parameters and direct quantities.

1:33:48.520 --> 1:33:50.210  
Haikun Xu  
Among certain models.

1:33:51.490 --> 1:33:57.680  
Haikun Xu  
But decision points analysis include two main parts, the first part is data.

1:33:58.370 --> 1:34:6.70  
Haikun Xu  
How we prepare for the data and sending parties model so the data part I'll first talk about how we define fishery feeds.

1:34:7.420 --> 1:34:11.820  
Haikun Xu  
And how we compute catches and associate that counts for feature release.

1:34:12.820 --> 1:34:16.330  
Haikun Xu  
Thou pop outs of how we define several dates and.

1:34:17.250 --> 1:34:22.210  
Haikun Xu  
How we compute a social network balance index and social accommodations?

1:34:23.70 --> 1:34:24.170  
Haikun Xu  
For serving plate.

1:34:25.120 --> 1:34:25.660  
Haikun Xu  
Uh.

1:34:27.170 --> 1:34:28.610  
Haikun Xu  
Then, on top about model.

1:34:29.410 --> 1:34:33.860  
Haikun Xu  
How we how we set up the model and how we fits model to data?

1:34:37.260 --> 1:34:38.980  
Haikun Xu  
First thing is fishing fleets.

1:34:40.590 --> 1:34:50.200  
Haikun Xu  
Well, no shop workshop provides a error for error simulation results so the region specific 50 please.

1:34:51.60 --> 1:34:54.40  
Haikun Xu  
On the default fishery definitions in our case.

1:34:55.360 --> 1:34:59.590  
Haikun Xu  
But if we explored removing like errors affiliate approach.

1:35:1.180 --> 1:35:5.580  
Haikun Xu  
And simplify the feature definitions by zooming only one fishery.

1:35:6.470 --> 1:35:8.290  
Haikun Xu  
Need a gear or set type.

1:35:10.210 --> 1:35:11.470  
Haikun Xu  
In addition to that.

1:35:12.160 --> 1:35:17.80  
Haikun Xu  
We also explored redefining associated person fish recipes.

1:35:17.790 --> 1:35:22.900  
Haikun Xu  
By applying a regression tree algorithm to simulated cell level conversation data.

1:35:25.250 --> 1:35:28.200  
Haikun Xu  
Uh hopefully ocean yellow thing.

1:35:29.350 --> 1:35:32.870  
Haikun Xu  
Associate person and long and the two most important fisheries.

1:35:33.510 --> 1:35:50.790  
Haikun Xu  
But we didn't fly the regression tree method to longline face because simulated conversation data for the longline fate has very small low spatial resolution is 10 by 2010 latitude by 20 degree longitude.

1:35:51.530 --> 1:35:52.770  
Haikun Xu  
And this we found.

1:35:53.650 --> 1:36:0.110  
Haikun Xu  
That's uh at least low resolution. There is that OK clear grouping of commendation data in space.

1:36:0.890 --> 1:36:5.320  
Haikun Xu  
That we only apply this method to associate person feature fleets.

1:36:6.180 --> 1:36:9.710  
Haikun Xu  
Which have 5 by 5 better less condition data?

1:36:11.120 --> 1:36:11.810  
Haikun Xu  
And.

1:36:12.520 --> 1:36:16.670  
Haikun Xu  
That regression tree algorithm has been implemented into our package.

1:36:18.70 --> 1:36:22.940  
Haikun Xu  
And this method unpackage may be new to you so in the next slide. I will briefly.

1:36:24.0 --> 1:36:25.850  
Haikun Xu  
Introduce this method.

1:36:27.210 --> 1:36:40.160  
Haikun Xu  
Well, this repair tree algorithm was based on linear coding at all. Twenty 10th work. So it uses recursive partitioning to search for hierarchical binary decision rules.

1:36:40.930 --> 1:36:43.980  
Haikun Xu  
Not while data into more homogeneous subgroups.

1:36:45.170 --> 1:37:3.240  
Haikun Xu  
And Binary decision rules are selected to provide the gradient decrease in the heterogeneity of the simulated that condition data. In other words, the rules are selected to search for highest percentage of variance explained in last condition data.

1:37:7.420 --> 1:37:14.670  
Haikun Xu  
And this recurrent tree algorithm in brief groups similar combination data into the same fishery.

1:37:15.420 --> 1:37:23.830  
Haikun Xu  
In this way, the selectivity constant selectivity is some probably assumption to be made for regression tree defined features.

1:37:25.220 --> 1:37:35.160  
Haikun Xu  
And in in our zone condition data are submitted by latitude and longitude and the user can also specify another 2 dimensions.

1:37:36.330 --> 1:37:37.40  
Haikun Xu  
Called her.

1:37:37.730 --> 1:37:40.140  
Haikun Xu  
And year so some.

1:37:41.300 --> 1:37:41.670  
Haikun Xu  
Uh.

1:37:42.320 --> 1:37:50.350  
Haikun Xu  
Example you think if sounds fisheries have very strong seasonal patterns. You may try adding quarter as another.

1:37:51.650 --> 1:37:58.900  
Haikun Xu  
Imagine to split to see whether the last comment data has seasonal pattern and example.

1:37:59.840 --> 1:38:4.690  
Haikun Xu  
In another case briefly opposite operation or?

1:38:5.740 --> 1:38:13.590  
Haikun Xu  
If fishing gear can change abruptly due to example management change in that case, we can add year also.

1:38:14.660 --> 1:38:15.770  
Haikun Xu  
Uh dimension to

1:38:16.470 --> 1:38:18.840  
Haikun Xu  
that's what dimension to split to see whether.

1:38:20.10 --> 1:38:24.160  
Haikun Xu  
The Alison can find there's a change in length times.

1:38:24.990 --> 1:38:29.40  
Haikun Xu  
By ear in that we can split the past comes into different time blocks.

1:38:31.890 --> 1:38:34.60  
Haikun Xu  
Users can specify number of.

1:38:35.180 --> 1:38:35.800  
Haikun Xu  
Splits.

1:38:36.470 --> 1:38:43.280  
Haikun Xu  
You algorithm for example, you want four fisheries you specify 3 space.

1:38:44.70 --> 1:38:46.10  
Haikun Xu  
3 space generates 4 features.

1:38:47.210 --> 1:38:52.470  
Haikun Xu  
And finally this package is available on GitHub Pearson Pink and.

1:38:54.40 --> 1:38:55.90  
Haikun Xu  
On this website.

1:38:56.340 --> 1:38:57.870  
Haikun Xu  
A user manual including.

1:38:58.570 --> 1:39:0.860  
Haikun Xu  
Or simple demonstration of how to use the.

1:39:1.880 --> 1:39:2.430  
Haikun Xu  
Package.

1:39:3.360 --> 1:39:4.310  
Haikun Xu  
Is available?

1:39:9.810 --> 1:39:18.590  
Haikun Xu  
The question is why we use the areas apply proach to include multiple fleets instead of just a single fleet per peer type.

1:39:20.60 --> 1:39:23.390  
Haikun Xu  
So here is a map of the mean length frequency for Associated.

1:39:24.260 --> 1:39:25.230  
Haikun Xu  
First thing fishery.

1:39:26.510 --> 1:39:27.920  
Haikun Xu  
And as you can see.

1:39:28.710 --> 1:39:34.340  
Haikun Xu  
There are spatial pattern in that frequency somewhere in the tropical in the tropics fish.

1:39:35.20 --> 1:39:38.490  
Haikun Xu  
Caught South China smaller you know parents into temperate region.

1:39:40.780 --> 1:39:53.190  
Haikun Xu  
And we know that selectivity and availability usually have spatial patterns and as a result. That's frequency fisheries less frequent less condition has spatial pattern as well.

1:39:54.800 --> 1:39:56.420  
Haikun Xu  
We use other fleet proach.

1:39:57.460 --> 1:40:1.920  
Haikun Xu  
So that's in the model fish can be removed as a right size.

1:40:4.780 --> 1:40:11.500  
Haikun Xu  
So here is a comparison of the region specific associated person fishery on the left.

1:40:12.800 --> 1:40:20.130  
Haikun Xu  
There is in the simulated data. There's one fishery for reason 1/2 and four and I think there's no.

1:40:21.420 --> 1:40:26.990  
Haikun Xu  
Catch associate person fishery catch in Region 3, so they're only three three threes.

1:40:28.300 --> 1:40:30.830  
Haikun Xu  
And on the right hand side it shows the result.

1:40:32.630 --> 1:40:33.400  
Haikun Xu  
Of the three.

1:40:34.200 --> 1:40:39.450  
Haikun Xu  
Uh associated person fisheries, according to the regulatory algorithm.

1:40:40.930 --> 1:40:43.750  
Haikun Xu  
That can see the splits are latitudinal.

1:40:45.130 --> 1:40:48.150  
Haikun Xu  
Uh so that to make the comparison.

1:40:49.310 --> 1:40:50.290  
Haikun Xu  
A more fair.

1:40:51.490 --> 1:40:56.400  
Haikun Xu  
I said 33 assorted person fisheries the same number as the.

1:40:57.400 --> 1:40:59.350  
Haikun Xu  
Region region specific one.

1:41:0.530 --> 1:41:10.380  
Haikun Xu  
For the three reasons. I here's a comparison of the mainland frequency that as I can see example in three fish called generally smaller.

1:41:11.60 --> 1:41:11.460  
Haikun Xu  
Uh.

1:41:12.520 --> 1:41:13.690  
Haikun Xu  
And compare then.

1:41:14.580 --> 1:41:17.190  
Haikun Xu  
The fish in caught in Region 2.

1:41:19.320 --> 1:41:22.90  
Haikun Xu  
Bringing two piece short generally smaller.

1:41:23.120 --> 1:41:24.630  
Haikun Xu  
And had large size.

1:41:25.730 --> 1:41:36.370  
Haikun Xu  
That would only see a smaller proportion of large fish and in comparison to in in. In comparison in ring three we see much more larger fish.

1:41:37.750 --> 1:41:40.60  
Haikun Xu  
Will they have different net condition patterns?

1:41:40.860 --> 1:41:42.450  
Haikun Xu  
Uh so we need to assume.

1:41:43.220 --> 1:41:49.70  
Haikun Xu  
Specify different selectivity curves for these three uh associated person inflicts.

1:41:53.460 --> 1:42:4.90  
Haikun Xu  
All the input sample size for associate person and online is defined at is equal to the number of spatial cells sampled.

1:42:4.870 --> 1:42:8.0  
Haikun Xu  
And for others it's filled with the input sample size.

1:42:9.530 --> 1:42:10.840  
Haikun Xu  
And to evaluate.

1:42:12.130 --> 1:42:21.540  
Haikun Xu  
The impact of the models models specification on model performance we set up two dimensions.

1:42:23.230 --> 1:42:27.910  
Haikun Xu  
The first dimension is how we defined associated person please.

1:42:28.710 --> 1:42:29.790  
Haikun Xu  
You can either have.

1:42:31.630 --> 1:42:40.510  
Haikun Xu  
A wealthy free procured set type. This is not just for the uh associated person listed for all feature all gear and set type.

1:42:41.960 --> 1:42:43.130  
Haikun Xu  
And in comparison.

1:42:44.50 --> 1:42:49.40  
Haikun Xu  
We have the default 3 written specific associated person fleets.

1:42:50.150 --> 1:42:55.120  
Haikun Xu  
And we also have those 3 regretting tree defined feeds for the software person Peachtree.

1:42:56.550 --> 1:43:5.530  
Haikun Xu  
So uh this, this small is caught one because I have 133 is called region and this model is called 3.

1:43:6.600 --> 1:43:8.640  
Haikun Xu  
And the second dimension, we look at is.

1:43:9.360 --> 1:43:14.800  
Haikun Xu  
How fisheries next comes are weighted can be simple weighted?

1:43:16.430 --> 1:43:19.480  
Haikun Xu  
Ohh more sample and it can also be calculated.

1:43:21.170 --> 1:43:24.410  
Haikun Xu  
So we have 2, \* 3, six models.

1:43:25.340 --> 1:43:29.260  
Haikun Xu  
In in the first uh in first step.

1:43:31.580 --> 1:43:36.610  
Haikun Xu  
The second second part of of data is serving plate.

1:43:37.500 --> 1:43:45.990  
Haikun Xu  
For index abundance of 30 feet. We we fit VAST to sell level longline see if we data simulated for Indian Ocean yellowfin.

1:43:47.230 --> 1:43:47.880  
Haikun Xu  
Ohh.

1:43:48.600 --> 1:43:57.290  
Haikun Xu  
In particular, we use the logic and log links for the linear predictors of encounter probability and policy catch rate, respectively, with adult method.

1:43:59.70 --> 1:43:59.760  
Haikun Xu  
And Bolts.

1:44:0.570 --> 1:44:1.860  
Haikun Xu  
Both terms include.

1:44:2.710 --> 1:44:9.600  
Haikun Xu  
Opposed in common probability and policy caprate include an interceptor a special term and special term for term.

1:44:12.580 --> 1:44:14.440  
Haikun Xu  
We used 150 spatial north.

1:44:15.330 --> 1:44:18.120  
Haikun Xu  
To simulate the space for a special temporal random effects.

1:44:21.530 --> 1:44:29.460  
Haikun Xu  
The next part is bought the CV of the index so it is actually time varying uh it computed as.

1:44:30.210 --> 1:44:35.250  
Haikun Xu  
The value has many by must plus C, which is a constant.

1:44:36.330 --> 1:44:42.320  
Haikun Xu  
He asked me to in essence, though it used to scale the CV means CV of the index.

1:44:48.150 --> 1:44:52.750  
Haikun Xu  
Well let's conditions for the three plate are also standardized.

1:44:54.120 --> 1:45:1.430  
Haikun Xu  
What we we failed VAST to cell level that's less specific longline security data simulated for Indian Ocean yellowfin?

1:45:3.80 --> 1:45:11.160  
Haikun Xu  
And the input data that specific specific CPU input data is simply the product of CPU observation.

1:45:11.860 --> 1:45:18.530  
Haikun Xu  
And let's pregnancy in the same trailer, which is defined as your quarter times latitude times longitude.

1:45:20.850 --> 1:45:23.20  
Haikun Xu  
And also it's it's a dot method.

1:45:24.430 --> 1:45:26.370  
Haikun Xu  
And both terms include.

1:45:27.90 --> 1:45:31.120  
Haikun Xu  
The saying an intercept term speaker and speaker, temporal term.

1:45:32.190 --> 1:45:35.780  
Haikun Xu  
And because this model is consultation expensive so.

1:45:36.520 --> 1:45:39.670  
Haikun Xu  
And we also consider the fact that we need to.

1:45:40.360 --> 1:45:44.430  
Haikun Xu  
Expand this uh work to another 99 replicates.

1:45:45.540 --> 1:45:48.800  
Haikun Xu  
So we need to do something to improve the model speed.

1:45:50.420 --> 1:45:53.0  
Haikun Xu  
Example we assume that.

1:45:53.980 --> 1:45:58.820  
Haikun Xu  
The random facts are soon to be a ID among Land Springs.

1:46:0.210 --> 1:46:8.40  
Haikun Xu  
And we only use very small number of special notes to simulate it. The spatial and spatial temporal started type of random facts.

1:46:8.890 --> 1:46:9.300  
Haikun Xu  
But.

1:46:9.990 --> 1:46:21.780  
Haikun Xu  
So overall the next next longline frequency is very sparse in space so we are all there are not a lot of actually unique letting longitude accommodation is available.

1:46:22.680 --> 1:46:28.170  
Haikun Xu  
Ohh and let's things are originally private other revolution of 5 centimeter.

1:46:29.110 --> 1:46:35.20  
Haikun Xu  
I to make it faster, I regroup them into 10 centimeter resolution so slightly higher.

1:46:35.950 --> 1:46:37.820  
Haikun Xu  
Reduce number of bins by half.

1:46:39.130 --> 1:46:42.80  
Haikun Xu  
And all hyperparameters are shared among lesbians.

1:46:43.660 --> 1:46:48.610  
Haikun Xu  
And we don't we did not apply bias correction just to increase the speed.

1:46:49.330 --> 1:46:54.590  
Haikun Xu  
When we repeat this process in this model for the other 99 replicates.

1:47:0.50 --> 1:47:3.400  
Haikun Xu  
And that condition standardized next conditions for 30 fleets.

1:47:4.100 --> 1:47:5.430  
Haikun Xu  
Are computed as?

1:47:7.430 --> 1:47:11.860  
Haikun Xu  
The standardized abundance index for a given length being and time.

1:47:13.870 --> 1:47:18.420  
Haikun Xu  
Our last divided by that value some of these value across all these things.

1:47:20.60 --> 1:47:21.630  
Haikun Xu  
An ample sample size.

1:47:22.420 --> 1:47:27.150  
Haikun Xu  
On the survey last comes is the number of spatial cell sampled.

1:47:28.200 --> 1:47:31.310  
Haikun Xu  
In retained that's specific CPUE data.

1:47:35.440 --> 1:47:38.980  
Haikun Xu  
Now let's jump to model part so model configurations.

1:47:39.900 --> 1:47:43.330  
Haikun Xu  
All biological parameters are fixed as their true values.

1:47:44.270 --> 1:47:51.240  
Haikun Xu  
Uh we know that steepness natural mortality and girls are confounded and are difficult estimate within assessment model so.

1:47:52.430 --> 1:47:58.330  
Haikun Xu  
In the first step we, we fix all those values and they are true.

1:47:59.0 --> 1:48:2.530  
Haikun Xu  
Two values, we didn't explore estimate some of these yet.

1:48:3.930 --> 1:48:10.260  
Haikun Xu  
And recommend deviations are estimated for every model year and assumed to sum to 0.

1:48:12.920 --> 1:48:15.890  
Haikun Xu  
And we discussed it briefly in the previous presentation.

1:48:16.850 --> 1:48:17.520  
Haikun Xu  
Like the

1:48:18.570 --> 1:48:24.420  
Haikun Xu  
and activity in the simulation model IS88 based so we, we use eight specific.

1:48:25.160 --> 1:48:28.890  
Haikun Xu  
Selectivity in the estimation model in stock synthesis.

1:48:29.790 --> 1:48:31.110  
Haikun Xu  
In order to be consistent.

1:48:33.650 --> 1:48:38.870  
Haikun Xu  
All selectivity it is soon to be asymptotic for the survey longline fleet.

1:48:39.840 --> 1:48:50.770  
Haikun Xu  
And Dome shaped for all fishery fits in green longline fleets. But it is important to mention that this downshifts activity is flexible enough.

1:48:51.900 --> 1:48:56.690  
Haikun Xu  
That, it could be asymptotic if someone is able to estimate.

1:48:57.540 --> 1:48:58.870  
Haikun Xu  
Asymptotic selectivity.

1:49:1.50 --> 1:49:10.360  
Haikun Xu  
Uh we use logistic or asymptotic selectivity and double normal in stock synthesis for Dome shaped selectivity curves.

1:49:12.100 --> 1:49:20.250  
Haikun Xu  
Go to a lack of accommodation data for the crow fishery, we would all three trophies share the same selectivity.

1:49:21.310 --> 1:49:28.780  
Haikun Xu  
And finally initial conditions is that the stock is seemed to be harvested from an equilibrium on 1st condition.

1:49:32.210 --> 1:49:35.120  
Haikun Xu  
We're here, the uh other steps of.

1:49:35.890 --> 1:49:37.190  
Haikun Xu  
Feeding them all of the data.

1:49:45.590 --> 1:49:47.320  
Haikun Xu  
First of all we need to load the.

1:49:48.270 --> 1:49:57.460  
Haikun Xu  
Uh original provided one region or four region access data file into the our environment, so they are for different models.

1:49:58.850 --> 1:50:0.400  
Haikun Xu  
The one region that four region.

1:50:1.990 --> 1:50:4.320  
Haikun Xu  
And then at a survey fleet.

1:50:5.640 --> 1:50:9.920  
Haikun Xu  
Including adding founded the abundance index and last conversations.

1:50:10.750 --> 1:50:15.880  
Haikun Xu  
And delete tagging data because we use every split Proach.

1:50:19.160 --> 1:50:21.850  
Haikun Xu  
And the for the regression tree models only.

1:50:23.580 --> 1:50:41.460  
Haikun Xu  
We extract the original product cell level data by 5 cell level data to get simulated 5. By 5 length completion. Data for associate person and then we run the regression tree algorithm to redefine 3 associated person fees.

1:50:46.50 --> 1:50:49.860  
Haikun Xu  
And for next step. We changed length condition of associated person feeds.

1:50:51.460 --> 1:50:54.900  
Haikun Xu  
Sample it can be either capitulated or simulated.

1:50:55.560 --> 1:50:56.10  
Haikun Xu  
And.

1:50:57.350 --> 1:51:6.300  
Haikun Xu  
Will be one fleet appear type like we region specific for regarding 3 defined associated person fleets.

1:51:10.760 --> 1:51:13.610  
Haikun Xu  
And folder regret entry to regression tree models only.

1:51:14.320 --> 1:51:14.700  
Haikun Xu  
Hello.

1:51:15.700 --> 1:51:19.130  
Haikun Xu  
Made the change of catches over their face because.

1:51:19.940 --> 1:51:21.810  
Haikun Xu  
Officially tuck needless change.

1:51:22.490 --> 1:51:26.200  
Haikun Xu  
We cannot use the default ones from from these two data.

1:51:28.560 --> 1:51:34.590  
Haikun Xu  
And last tap it let the last step is to write the new SD data using this function.

1:51:35.340 --> 1:51:36.690  
Haikun Xu  
Provided by

1:51:37.570 --> 1:51:38.550  
Haikun Xu  
our full access.

1:51:40.780 --> 1:51:44.640  
Haikun Xu  
But we have three steps to run each of these six models.

1:51:46.250 --> 1:51:49.620  
Haikun Xu  
First step around the model is fancy.

1:51:50.580 --> 1:51:55.580  
Haikun Xu  
Wait equal to 1, so basically it's using input sample size.

1:51:56.600 --> 1:52:0.940  
Haikun Xu  
As I talked sample size and then run again with Francis.

1:52:1.650 --> 1:52:2.620  
Haikun Xu  
Francis wait.

1:52:3.290 --> 1:52:4.360  
Haikun Xu  
And finally.

1:52:6.130 --> 1:52:7.560  
Haikun Xu  
Rides for last time.

1:52:8.290 --> 1:52:10.590  
Haikun Xu  
Are using Francis weight and?

1:52:11.590 --> 1:52:14.480  
Haikun Xu  
Suggested recruitment bias adjustment.

1:52:16.770 --> 1:52:20.740  
Haikun Xu  
All these three steps are repeated for each of these six models.

1:52:24.600 --> 1:52:25.550  
Haikun Xu  
Mueller results.

1:52:25.730 --> 1:52:27.780  
Haikun Xu  
Ohh here it shows.

1:52:28.600 --> 1:52:30.400  
Haikun Xu  
Spawning Bell Mass and depletion.

1:52:31.310 --> 1:52:32.420  
Haikun Xu  
All these 6 miles.

1:52:35.830 --> 1:52:37.160  
Haikun Xu  
And the depletion level.

1:52:37.690 --> 1:52:39.550  
Haikun Xu  
So typing introductory.

1:52:40.820 --> 1:52:43.750  
Haikun Xu  
Are most similar among these six models?

1:52:44.560 --> 1:52:46.450  
Haikun Xu  
So maybe example the two.

1:52:47.30 --> 1:52:52.620  
Haikun Xu  
Ohh, 133 put gear type once the another four close to each other.

1:52:53.750 --> 1:52:59.340  
Haikun Xu  
But when we look at the absolute spawning biomass estimates. We tend to be quite different from each other.

1:53:0.810 --> 1:53:2.90  
Haikun Xu  
And the two.

1:53:4.130 --> 1:53:8.760  
Haikun Xu  
The two non Teresa Pit ones have the most extreme estimates.

1:53:16.330 --> 1:53:19.10  
Haikun Xu  
We we do some more diagnostics.

1:53:20.490 --> 1:53:27.20  
Haikun Xu  
To its check whether it is those models perform well to at least based on the single replicate.

1:53:27.850 --> 1:53:35.900  
Haikun Xu  
We've got six models. There's we only use one model with catch weighted that's comes and remaining tree defined features.

1:53:36.710 --> 1:53:41.40  
Haikun Xu  
Ask for use this only use this model as a case study to do the diagnostics.

1:53:42.510 --> 1:53:47.0  
Haikun Xu  
First, we check the wrong wrong task for index residuals.

1:53:47.970 --> 1:53:57.870  
Haikun Xu  
So the colors green means they passed through frost test and it this is from it's based on function as plots wrong runs test.

1:53:58.640 --> 1:54:0.270  
Haikun Xu  
From this R Package.

1:54:3.320 --> 1:54:6.160  
Haikun Xu  
Here's a summary of the fit.

1:54:7.360 --> 1:54:14.30  
Haikun Xu  
To Aggregated last pregnancy, which relies on the left and survey that counts on the right.

1:54:15.610 --> 1:54:22.360  
Haikun Xu  
Overall face pretty well and we see some some weekly in the long line.

1:54:23.90 --> 1:54:25.460  
Haikun Xu  
Last frequency data also here.

1:54:27.380 --> 1:54:27.990  
Haikun Xu  
It is.

1:54:29.120 --> 1:54:33.110  
Haikun Xu  
Probably due to the fact that the longer dance comes have both.

1:54:33.870 --> 1:54:37.160  
Haikun Xu  
Partly sparse special very low spatial resolution and.

1:54:38.0 --> 1:54:39.910  
Haikun Xu  
Marlow set effective sample size.

1:54:43.490 --> 1:54:47.120  
Haikun Xu  
And all the Nasties is based on effective sample size equal 5.

1:54:54.110 --> 1:54:56.340  
Haikun Xu  
Now is our zero likelihood profile.

1:54:59.310 --> 1:55:7.890  
Haikun Xu  
The purple shows the total likelihood Nappy log likelihood include include different components. The rat is fish recommendations.

1:55:9.380 --> 1:55:11.240  
Haikun Xu  
So this uh survey combinations.

1:55:13.140 --> 1:55:15.830  
Haikun Xu  
Yellow is index abundance index.

1:55:17.290 --> 1:55:19.680  
Haikun Xu  
And Green is recruiting penalty.

1:55:21.270 --> 1:55:21.700  
Haikun Xu  
Please.

1:55:22.350 --> 1:55:23.630  
Haikun Xu  
This here is the MLE.

1:55:24.830 --> 1:55:25.120  
Haikun Xu  
But.

1:55:27.530 --> 1:55:31.540  
Haikun Xu  
The MRI is according to this figure is mainly trade off between.

1:55:32.730 --> 1:55:35.120  
Haikun Xu  
Precooling penalty and fishery less cops.

1:55:37.720 --> 1:55:46.650  
Haikun Xu  
And surprisingly in this model, excluding to this model diagnostics, the in about an index show little information.

1:55:47.430 --> 1:55:48.220  
Haikun Xu  
Regarding.

1:55:48.930 --> 1:55:50.590  
Haikun Xu  
Ah population scale.

1:55:51.890 --> 1:56:1.580  
Haikun Xu  
But here's the fit to the index. Sundance is fit pretty well to index like guess this load information could be due to the fact that.

1:56:2.590 --> 1:56:6.600  
Haikun Xu  
The contrast in index is not very large.

1:56:10.610 --> 1:56:14.670  
Haikun Xu  
Another another diagnostics is estructure production model.

1:56:15.780 --> 1:56:19.990  
Haikun Xu  
We don't show the CCA capturing analysis because it's smaller does not converge.

1:56:22.690 --> 1:56:26.240  
Haikun Xu  
This is spawning bell mask and sunbelt mass ratio.

1:56:27.640 --> 1:56:29.250  
Haikun Xu  
According to the ratio.

1:56:30.50 --> 1:56:30.770  
Haikun Xu  
The model is.

1:56:31.530 --> 1:56:35.400  
Haikun Xu  
Ohh it is able to provide the production function for any ocean yellowfin.

1:56:36.460 --> 1:56:40.350  
Haikun Xu  
And we look at the absolute value of strong environments.

1:56:41.770 --> 1:56:46.930  
Haikun Xu  
Though instructor production model asked me higher biomass in comparison to integrating model in blue.

1:56:48.240 --> 1:56:50.950  
Haikun Xu  
But one uh recommend debates are estimated.

1:56:52.810 --> 1:56:53.610  
Haikun Xu  
The two.

1:56:54.490 --> 1:56:57.680  
Haikun Xu  
I'm serious follow pretty close to each other.

1:56:58.630 --> 1:57:2.580  
Haikun Xu  
So calling to extra framework structure production model.

1:57:3.900 --> 1:57:5.870  
Haikun Xu  
The ingredient model performed pretty well.

1:57:7.510 --> 1:57:9.520  
Haikun Xu  
And is that what we have production function.

1:57:11.790 --> 1:57:13.640  
Haikun Xu  
Uh retrospective pattern.

1:57:14.420 --> 1:57:21.990  
Haikun Xu  
Are we didn't compute like the state we didn't compute statistics like the morning slow but just.

1:57:22.660 --> 1:57:24.670  
Haikun Xu  
Look at looking at this figure tell us.

1:57:25.400 --> 1:57:26.200  
Haikun Xu  
Now is

1:57:26.930 --> 1:57:29.560  
Haikun Xu  
Weiner retrospective pattern.

1:57:32.930 --> 1:57:36.400  
Haikun Xu  
We hear the summary of the single result for the single replicate.

1:57:37.130 --> 1:57:41.860  
Haikun Xu  
Will six models compared such a notable different notably different?

1:57:42.800 --> 1:57:48.850  
Haikun Xu  
Estimates of spawning Bell, Mass, but they have similar trends in the spawning bell mass ratio.

1:57:49.730 --> 1:57:58.30  
Haikun Xu  
Depletion level and two models, which ignores Erica Fleet have the most extreme estimates of spawning biomass.

1:57:59.960 --> 1:58:3.710  
Haikun Xu  
And examined model in the case study base model.

1:58:4.460 --> 1:58:7.430  
Haikun Xu  
With well to data based on more diagnostics.

1:58:12.0 --> 1:58:12.570  
Haikun Xu  
And.

1:58:13.880 --> 1:58:14.650  
Haikun Xu  
After this.

1:58:15.520 --> 1:58:19.540  
Haikun Xu  
With other diagnostics within multiple phones well so expands.

1:58:20.610 --> 1:58:25.60  
Haikun Xu  
The analysis to a the other 99 replicates.

1:58:26.790 --> 1:58:30.480  
Haikun Xu  
What do you see in this figure is the convergence rate?

1:58:32.270 --> 1:58:33.440  
Haikun Xu  
Uh here is

1:58:34.870 --> 1:58:35.930  
Haikun Xu  
I want to mention that.

1:58:36.660 --> 1:58:44.830  
Haikun Xu  
The regression tree algorithm defines identical authority presence features among replicas, so each replicates result to.

1:58:47.380 --> 1:58:51.690  
Haikun Xu  
Uh using the cell level simulated data and they the entry.

1:58:52.500 --> 1:58:53.400  
Haikun Xu  
At any point.

1:58:54.170 --> 1:58:57.450  
Haikun Xu  
Saying fishery definitions for the society person.

1:58:58.110 --> 1:58:58.870  
Haikun Xu  
Are fisheries?

1:59:0.780 --> 1:59:2.450  
Haikun Xu  
And here is the summary of.

1:59:3.210 --> 1:59:3.900  
Haikun Xu  
Convergence.

1:59:5.800 --> 1:59:6.730  
Haikun Xu  
Include.

1:59:7.420 --> 1:59:7.860  
Haikun Xu  
Means.

1:59:8.760 --> 1:59:12.230  
Haikun Xu  
Not six uh the last specific last model.

1:59:12.930 --> 1:59:18.590  
Haikun Xu  
That's not converge so there are three of them for the other 97 ones.

1:59:19.640 --> 1:59:23.750  
Haikun Xu  
The Blue Earth, sorry the green ones means access model.

1:59:25.190 --> 1:59:26.150  
Haikun Xu  
Does not converge?

1:59:26.950 --> 1:59:29.240  
Haikun Xu  
And the red ones are the converged ones.

1:59:30.400 --> 1:59:34.270  
Haikun Xu  
So by looking at this we cannot convergence rates for each model.

1:59:35.750 --> 1:59:36.400  
Haikun Xu  
And heart.

1:59:39.110 --> 1:59:43.680  
Haikun Xu  
I'm here such a trajectory of spawning Bell Mass.

1:59:45.210 --> 1:59:46.100  
Haikun Xu  
Which model?

1:59:47.90 --> 1:59:48.160  
Haikun Xu  
And black lines.

1:59:50.450 --> 1:59:53.880  
Haikun Xu  
On the other estimates from the single replicate.

1:59:56.320 --> 1:59:58.50  
Haikun Xu  
The Next One is the depletion level.

1:59:59.880 --> 2:0:2.170  
Haikun Xu  
All the converged wrong converged ones.

2:0:4.720 --> 2:0:18.770  
Haikun Xu  
So we are trying to find a way to compare multiple performance and the only the best way we can think about so far is compared estimate of log R0?

2:0:19.570 --> 2:0:21.350  
Haikun Xu  
What is is true value so this?

2:0:22.190 --> 2:0:34.320  
Haikun Xu  
This is only value of it's not not only but this is an important parameter in the model. We know and we know what two value is in the similar in the simulation model?

2:0:35.0 --> 2:0:38.320  
Haikun Xu  
So we are able to compare estimating results with the true.

2:0:43.390 --> 2:0:45.440  
Haikun Xu  
And here are the box plots for.

2:0:46.310 --> 2:0:49.840  
Haikun Xu  
Admitted Lock R0 from the converged ones.

2:0:50.970 --> 2:0:53.770  
Haikun Xu  
And horizontal line shows the true value.

2:0:55.330 --> 2:0:58.510  
Haikun Xu  
The The Workshop provides in document.

2:0:59.840 --> 2:1:0.960  
Haikun Xu  
What can we conclude?

2:1:1.670 --> 2:1:2.260  
Haikun Xu  
From.

2:1:2.970 --> 2:1:5.40  
Haikun Xu  
Just based on Lock R0.

2:1:6.260 --> 2:1:9.250  
Haikun Xu  
The first ignoring errors of fleet approach.

2:1:11.90 --> 2:1:11.980  
Haikun Xu  
Those two models.

2:1:13.70 --> 2:1:14.800  
Haikun Xu  
Resulting worst convergence.

2:1:16.160 --> 2:1:17.420  
Haikun Xu  
And most biased.

2:1:18.440 --> 2:1:19.90  
Haikun Xu  
Are zero?

2:1:22.400 --> 2:1:25.760  
Haikun Xu  
And in comparative to step away that that's fishery less Toms.

2:1:28.90 --> 2:1:32.220  
Haikun Xu  
Touch with it, which reliance comes little better convergence rate.

2:1:33.500 --> 2:1:34.650  
Haikun Xu  
And last part.

2:1:36.790 --> 2:1:37.440  
Haikun Xu  
Our zero.

2:1:40.370 --> 2:1:43.810  
Haikun Xu  
And given that let's count our captivated.

2:1:44.870 --> 2:1:45.570  
Haikun Xu  
Those two.

2:1:47.270 --> 2:1:48.860  
Haikun Xu  
And regarding tree defined.

2:1:50.70 --> 2:1:50.920  
Haikun Xu  
Basically, it's

2:1:52.650 --> 2:1:54.260  
Haikun Xu  
correspond to better convergence.

2:1:55.280 --> 2:1:59.40  
Haikun Xu  
And also less biased Log R0 estimate.

2:2:2.470 --> 2:2:3.610  
Haikun Xu  
So, in summary.

2:2:5.210 --> 2:2:12.680  
Haikun Xu  
Please comparison chaos tell us that the best approach among these six models is using errors of flip approach.

2:2:13.800 --> 2:2:19.750  
Haikun Xu  
And for for error free approach, we use regression tree to define fishing fleets.

2:2:21.40 --> 2:2:27.670  
Haikun Xu  
And for the fishing fleets, we use catch waited desktops instead of simulated desktops.

2:2:30.710 --> 2:2:34.440  
Haikun Xu  
And also we also expand this work.

2:2:35.80 --> 2:2:39.290  
Haikun Xu  
Some of the model 6 ohh 4/4 of the six models.

2:2:40.130 --> 2:2:42.180  
Haikun Xu  
To another simulation.

2:2:43.10 --> 2:2:45.260  
Haikun Xu  
With higher effective sample size.

2:2:46.50 --> 2:2:48.580  
Haikun Xu  
Was all serious alts have presented on the right hand side?

2:2:50.640 --> 2:2:52.570  
Haikun Xu  
Will comparison between these two?

2:2:53.570 --> 2:2:56.890  
Haikun Xu  
Shows that with higher effective sample size.

2:2:58.780 --> 2:3:1.980  
Haikun Xu  
It's it's you surprisingly even lower convergence rates.

2:3:4.790 --> 2:3:6.840  
Haikun Xu  
And similar accuracy of.

2:3:7.890 --> 2:3:10.700  
Haikun Xu  
Based on a Lockhart Lock R0.

2:3:11.890 --> 2:3:15.430  
Haikun Xu  
And higher precedent based on Lock R0 as well.

2:3:16.870 --> 2:3:29.150  
Haikun Xu  
Please tell us that the similar accuracy tell us that the bias in asked me of log. R0 is likely not caused by low sample size. You could do to model misspecification.

2:3:30.520 --> 2:3:34.670  
Haikun Xu  
It cost me increase the sample size does not reduce.

2:3:35.600 --> 2:3:36.270  
Haikun Xu  
The bias.

2:3:39.90 --> 2:3:43.80  
Haikun Xu  
OK uh last part a few discussions points.

2:3:44.140 --> 2:3:50.210  
Haikun Xu  
Uh we compare multiple performance solely based on estimate of our zero because we know it's true value.

2:3:51.460 --> 2:3:57.830  
Haikun Xu  
Doing in the future, we need to estimate a computer more estimated values.

2:3:58.530 --> 2:3:59.520  
Haikun Xu  
With the true.

2:4:0.510 --> 2:4:10.80  
Haikun Xu  
Based on example fishing mortality, spawning biomass and spawning biomass ratio to fully evaluate multiple comments. I think this will be done in the next step.

2:4:14.70 --> 2:4:14.680  
Haikun Xu  
And.

2:4:15.760 --> 2:4:22.300  
Haikun Xu  
Why we use why I IDC currently use this proach use RSS feeds?

2:4:23.240 --> 2:4:23.890  
Haikun Xu  
With VAST.

2:4:25.470 --> 2:4:26.840  
Haikun Xu  
In our current assessments.

2:4:27.940 --> 2:4:31.990  
Haikun Xu  
For bigger and yellow pin and this year, also for skipjack.

2:4:32.940 --> 2:4:45.870  
Haikun Xu  
I think because currently our tagging data available tagging data is very limited in both space and time so we don't, they cannot be used to reliably inform movement rates within the EPO.

2:4:50.190 --> 2:4:53.220  
Haikun Xu  
And another thing to discuss is parsimony.

2:4:54.200 --> 2:4:56.730  
Haikun Xu  
How many fisheries could we define for?

2:4:57.400 --> 2:4:58.810  
Haikun Xu  
Each pair of that type.

2:4:59.690 --> 2:5:3.800  
Haikun Xu  
So based on the results. I just show them that.

2:5:4.880 --> 2:5:10.440  
Haikun Xu  
Not using error speech areas as speech torch may not be enough.

2:5:11.350 --> 2:5:13.700  
Haikun Xu  
But like how many how many.

2:5:15.0 --> 2:5:23.930  
Haikun Xu  
Sample assorted person physically are good enough and does not lead to overfitting is 234 or five so it's a question.

2:5:24.870 --> 2:5:26.0  
Haikun Xu  
We need to think about.

2:5:28.290 --> 2:5:33.320  
Haikun Xu  
And because of the very low spatial resolution of less condition data provided.

2:5:34.360 --> 2:5:42.810  
Haikun Xu  
We cannot use the regarding tree approach to define redefine longline fishery, please so with better data available.

2:5:43.570 --> 2:5:44.920  
Haikun Xu  
This is something we can.

2:5:45.960 --> 2:5:48.710  
Haikun Xu  
All an improved the model naturally improve the model.

2:5:51.130 --> 2:5:54.280  
Haikun Xu  
And last point We want to discuss is diagnostics.

2:5:55.150 --> 2:5:56.60  
Haikun Xu  
Oh, oh.

2:5:57.50 --> 2:5:58.750  
Haikun Xu  
Whether this nonspatial.

2:5:59.790 --> 2:6:3.840  
Haikun Xu  
Access model is adequate to come for like spatial processes.

2:6:5.820 --> 2:6:16.630  
Haikun Xu  
For these errors, please coach assuming that the stock is well mixed within the Indian Ocean maybe less reliable ones. There are some signs suggesting.

2:6:17.400 --> 2:6:20.650  
Haikun Xu  
For example, over local population dynamics going on.

2:6:25.480 --> 2:6:28.190  
Haikun Xu  
This map shows relative depletion rate.

2:6:29.160 --> 2:6:32.30  
Haikun Xu  
Or time based on standardized longline CPUE.

2:6:34.240 --> 2:6:40.220  
Haikun Xu  
The blue means or more faster, decreasing rates in longer CPUE.

2:6:42.260 --> 2:6:47.550  
Haikun Xu  
Or can see, there is a some there is some special population.

2:6:48.370 --> 2:6:50.210  
Haikun Xu  
Dynamics going on like.

2:6:51.230 --> 2:6:53.200  
Haikun Xu  
This this circle region.

2:6:54.0 --> 2:6:56.330  
Haikun Xu  
Such that there could be signing vocal dictation.

2:6:57.230 --> 2:6:59.580  
Haikun Xu  
In this region two took several high fishing mortality.

2:7:5.960 --> 2:7:7.840  
Haikun Xu  
And this nonspatial approach.

2:7:9.180 --> 2:7:15.130  
Haikun Xu  
May not be adequate one there is a strong local depression going on, but the question is.

2:7:16.400 --> 2:7:24.990  
Haikun Xu  
Like what's it. When to what extent the local the local depletion happens, the nonspatial approach may not be adequate enough.

2:7:26.340 --> 2:7:29.950  
Haikun Xu  
This cannot this is a question for the future.

2:7:30.830 --> 2:7:32.680  
Haikun Xu  
And the last light.

2:7:34.60 --> 2:7:40.340  
Haikun Xu  
And also this nonspatial approach, assuming that abundance index and social that combinations for the survey.

2:7:43.240 --> 2:7:46.30  
Haikun Xu  
Are for the entire population in the Indian Ocean?

2:7:47.190 --> 2:7:57.60  
Haikun Xu  
And these proach may be less reliable when the spatial coverage official dependent data of some CPUE is limited or shipping shipped systematically or time.

2:7:58.270 --> 2:8:2.530  
Haikun Xu  
The fishery dependent data we know they have preferential sampling issue.

2:8:3.630 --> 2:8:7.700  
Haikun Xu  
And one stock is becoming more depleted over time.

2:8:8.670 --> 2:8:25.400  
Haikun Xu  
Of fish with this fisheries data may have different distribution may they may move out of the depleted region gradually so causing limited special courage and systematic change in the spatial distribution of data.

2:8:26.200 --> 2:8:27.390  
Haikun Xu  
And this can.

2:8:28.860 --> 2:8:30.300  
Haikun Xu  
If this happens, though.

2:8:31.610 --> 2:8:37.40  
Haikun Xu  
Abundance index and left comes for survey could could be biased.

2:8:37.890 --> 2:8:43.410  
Haikun Xu  
And may not actually represent the population level condition for the entire Indian Ocean.

2:8:44.840 --> 2:8:46.450  
Haikun Xu  
And thank you for your attention.

2:8:47.220 --> 2:8:49.670  
Haikun Xu  
And and we're happy to take questions.

2:8:55.0 --> 2:8:56.410  
Aaron Berger (Guest)  
OK, thank you haikun.

2:8:58.410 --> 2:9:8.260  
Aaron Berger (Guest)  
For your great presentation. Yes, we got the time for questions so go ahead and enter something in the chat or raise your hand either one.

2:9:28.530 --> 2:9:30.840  
Dan (Guest)  
I can start with a question I got lots of questions.

2:9:32.720 --> 2:9:36.120  
Dan (Guest)  
This was yeah, this was really interesting and like a very.

2:9:36.880 --> 2:9:41.890  
Dan (Guest)  
Unique and approach to the whole uh process of developing kind of these spatially, implicit models.

2:9:43.920 --> 2:9:45.750  
Dan (Guest)  
Trying to figure out which question I wanna ask.

2:9:47.440 --> 2:9:51.260  
Dan (Guest)  
I kind of liked that last point you had about the issues.

2:9:51.970 --> 2:10:12.770  
Dan (Guest)  
Of localized depletion and how you know using the VAST model. You can really start to view some of those issues, or get an idea of you know where there might be localized to position even though you're not doing a full spatial stock assessment model and I was just wondering if you could maybe elaborate on that a bit and your thoughts on you know.

2:10:13.580 --> 2:10:25.170  
Dan (Guest)  
The kind of interaction between using kind of VAST as a diagnostic of whether you know a spatial a fully spatial model might be warranted.

2:10:25.970 --> 2:10:41.890  
Dan (Guest)  
And then you know the trade-offs there between like you know doing kind of the CPUE standardization with VAST versus the higher data needs of like a full spatial assessment and I just I guess talk about that a little bit.

2:10:44.820 --> 2:10:47.80  
Haikun Xu  
Yes, uh so yeah.

2:10:48.60 --> 2:10:54.570  
Haikun Xu  
The the depletion trend here is based on standardized long SB from last.

2:10:55.870 --> 2:11:0.980  
Haikun Xu  
And so, based on this we can see like local depletion could be going on in this region.

2:11:2.170 --> 2:11:2.630  
Haikun Xu  
And.

2:11:3.520 --> 2:11:12.120  
Haikun Xu  
Our seemed to be like a split around here, there could be local dynamics North and South of this split.

2:11:14.490 --> 2:11:28.360  
Haikun Xu  
And one thing I want to mention is that the longline data. Uh in the simulated in the simulation does not cover like the entire region. It's not the survey data speech data and the.

2:11:29.130 --> 2:11:30.500  
Haikun Xu  
One caveat of this.

2:11:31.770 --> 2:11:37.600  
Haikun Xu  
This map is that for the for this region is data poor.

2:11:38.680 --> 2:11:42.430  
Haikun Xu  
And there's not a lot of online data available, so the trend here.

2:11:44.790 --> 2:11:50.560  
Haikun Xu  
I know it could mean it could also mean there is no lot of data available in this region so it just.

2:11:51.510 --> 2:12:0.300  
Haikun Xu  
3 regress to the mean condition over time, so that's why we don't see a lot of trend here and in this region. We have a lot of data.

2:12:1.830 --> 2:12:4.490  
Haikun Xu  
And we can see the trend better over time.

2:12:5.390 --> 2:12:8.80  
Haikun Xu  
For this, this map could be little bit.

2:12:8.800 --> 2:12:9.400  
Haikun Xu  
Uh.

2:12:10.810 --> 2:12:11.780  
Haikun Xu  
So work for that.

2:12:12.590 --> 2:12:13.320  
Haikun Xu  
Misleading.

2:12:14.650 --> 2:12:15.230  
Haikun Xu  
Because.

2:12:17.10 --> 2:12:23.220  
Haikun Xu  
Like in this thread and it may there may be no recent data available, but we need to.

2:12:24.470 --> 2:12:30.990  
Haikun Xu  
Uh we need to, I think the important thing is that we need to find a good temporal window. That's

2:12:31.900 --> 2:12:36.160  
Haikun Xu  
to uh not also places have data otherwise.

2:12:38.180 --> 2:12:41.490  
Haikun Xu  
On last do the interpolation it can cause.

2:12:42.590 --> 2:12:45.800  
Haikun Xu  
Misleading of the trend somewhere here is low because.

2:12:46.810 --> 2:12:48.930  
Haikun Xu  
Just because there are not a lot of data available.

2:12:49.960 --> 2:12:52.0  
Haikun Xu  
And this is one thing I want to mention.

2:12:52.810 --> 2:12:53.360  
Haikun Xu  
And.

2:12:54.70 --> 2:12:56.710  
Haikun Xu  
Yeah, this is I haven't really thought about.

2:12:58.530 --> 2:12:59.300  
Haikun Xu  
How to

2:13:0.230 --> 2:13:6.140  
Haikun Xu  
use fast to like as diagnostics to for the spatial and nonspatial?

2:13:7.30 --> 2:13:7.700  
Haikun Xu  
Models.

2:13:8.710 --> 2:13:9.690  
Haikun Xu  
I don't know whether.

2:13:10.610 --> 2:13:14.820  
Haikun Xu  
Other people in the group Marco Carolina want to comment on this issue.

2:13:17.90 --> 2:13:23.940  
Aaron Berger (Guest)  
Well, I see Mark has his hand raised so go ahead and Mark maybe want to comment that on that or something else.

2:13:25.280 --> 2:13:29.110  
Mark Maunder  
Yeah, no, I I just wanted to follow up on on the question.

2:13:30.730 --> 2:13:36.90  
Mark Maunder  
And really about what the idea behind the whole concept is and things like it.

2:13:36.780 --> 2:13:37.500  
Mark Maunder  
In the past.

2:13:38.400 --> 2:13:46.180  
Mark Maunder  
Often, what we used to do in the areas as fisheries approaches that we'd create a index of abundance for each of the areas.

2:13:47.480 --> 2:13:47.950  
Mark Maunder  
Right.

2:13:48.890 --> 2:13:59.120  
Mark Maunder  
In reality that probably is not a good idea because each of those areas is indexing a different part of the stock and if there's incomplete mixing then.

2:13:59.840 --> 2:14:1.480  
Mark Maunder  
We're going to get different trends.

2:14:2.290 --> 2:14:30.980  
Mark Maunder  
And so that's why we went to the spatial analysis of CPUE and then you know basically summing up the The Densities in each area and if you had good random sampling then your index of abundance is actually gonna be a really good index of the whole population. Even if there is a you know, spatial structure with limited movement and stuff. At least your index is gonna be a good index of the total population. So when you're doing a single population.

2:14:32.410 --> 2:14:38.60  
Mark Maunder  
Model and areas as fleets that kind of makes sense and then the areas as fleets part.

2:14:38.800 --> 2:14:40.170  
Mark Maunder  
And really just taking the.

2:14:40.820 --> 2:14:45.860  
Mark Maunder  
Umm patch out at the right size, so it's completely independent of the.

2:14:47.330 --> 2:14:51.40  
Mark Maunder  
Index of abundance and that's why we do the.

2:14:52.50 --> 2:14:54.530  
Mark Maunder  
OK catch rating of the composition for the.

2:14:57.720 --> 2:15:10.290  
Mark Maunder  
That's CPUE waiting by space of the length frequency composition of the index right. So we're trying to get those two press processes separated out and modeled more appropriately.

2:15:11.570 --> 2:15:27.250  
Mark Maunder  
And the final thing I I wanna mention I mean, there is the problem with with the index with the what haikun was talking about with you know when you have large parts of the population that don't have samples in some years can cause huge biases in the indices, but

2:15:30.20 --> 2:15:30.420  
Mark Maunder  
the

2:15:31.550 --> 2:15:33.510  
Mark Maunder  
and now I forgot what I was gonna say to us.

2:15:34.420 --> 2:15:38.830  
Mark Maunder  
Talk about those those are one other point I was gonna make but I I can't remember what it is now but I'll.

2:15:40.260 --> 2:15:42.140  
Mark Maunder  
Let you know if I remember it sorry.

2:15:49.170 --> 2:15:52.480  
Aaron Berger (Guest)  
OK thanks mark for that Haikun in your response or.

2:15:55.250 --> 2:16:2.260  
Aaron Berger (Guest)  
We can go to the next question as well, yeah, OK. I see Dan you have your hand raised Dan fu.

2:16:8.950 --> 2:16:12.600  
Fu, Dan (NFITD)  
Hi yeah, it seems to be unable to unmute.

2:16:14.240 --> 2:16:19.230  
Fu, Dan (NFITD)  
Like could that's a very comprehensive on methods on.

2:16:19.870 --> 2:16:20.940  
Fu, Dan (NFITD)  
If I understand.

2:16:21.730 --> 2:16:23.380  
Fu, Dan (NFITD)  
Correctly, a lot of you.

2:16:24.200 --> 2:16:32.800  
Fu, Dan (NFITD)  
Talk or focus is to come up with a better way of standardized the lens composition data you talking about.

2:16:34.580 --> 2:16:54.190  
Fu, Dan (NFITD)  
Using the catch weighted or bounded weighted on the on the cell by cell basis among all obviously there's there's it's beneficial to to improve the you know precision of those of those estimates, but I just wondering how important that is if you have any field of how important that is.

2:16:56.90 --> 2:16:59.740  
Fu, Dan (NFITD)  
Because in the context of you know, we're doing those assessment, it tends to.

2:17:0.700 --> 2:17:9.480  
Fu, Dan (NFITD)  
Downweight your your your your size data eventually as you did, in your presentation right use Francis Mess Mess, SUDOANG, those down window size data.

2:17:10.330 --> 2:17:29.380  
Fu, Dan (NFITD)  
Uh maybe if I move away from the simulation exercise talking about the tuna assessment. I mean in in in our area. We we also tends to try to have different ways to come up with you know to standardize not not standardized to derive those lens composition data. You know different ways to derive them I mean, not as.

2:17:30.250 --> 2:17:34.270  
Fu, Dan (NFITD)  
Good as the master use here, but it turns out to be those generally not that.

2:17:34.960 --> 2:17:47.440  
Fu, Dan (NFITD)  
Influential especially if you're downweighted any in any model so I just want if you have any fuel in terms of you know with all those effort put in there, whether it's that's that that's worthwhile thank you.

2:17:49.150 --> 2:18:2.60  
Haikun Xu  
All right, then thank you for your question. Uh yes, this is a simulation study so which means we know the true like model, the true biological parameters in this case.

2:18:2.840 --> 2:18:3.290  
Haikun Xu  
Uh.

2:18:3.970 --> 2:18:5.400  
Haikun Xu  
The Fit to length comes.

2:18:6.340 --> 2:18:14.150  
Haikun Xu  
Will be better than in real world cases because in real cases, the some part models.

2:18:14.920 --> 2:18:21.520  
Haikun Xu  
Uh misspecified and when we use, Francis Francis wait, the Francis waiting method.

2:18:22.380 --> 2:18:27.250  
Haikun Xu  
But in the in real world case only further down with the last time because of the.

2:18:27.970 --> 2:18:28.620  
Haikun Xu  
Forfeit.

2:18:29.910 --> 2:18:30.360  
Haikun Xu  
And.

2:18:32.30 --> 2:18:32.720  
Haikun Xu  
Here.

2:18:35.170 --> 2:18:37.800  
Haikun Xu  
So here is a comparison.

2:18:39.900 --> 2:18:48.540  
Haikun Xu  
Of catch waited last count with sample weighted last counts, so the first three are calculated last comes speech rights comes.

2:18:49.370 --> 2:18:55.690  
Haikun Xu  
And the least three of assemble weighted that counts you can see, there's a distinct.

2:18:56.720 --> 2:19:5.390  
Haikun Xu  
Hadn't took those Kath Weighted Mascons asked me lower uh R0 Independence Sandwich that cost but.

2:19:7.130 --> 2:19:10.780  
Haikun Xu  
This is obvious in the simulation but I.

2:19:11.910 --> 2:19:13.840  
Haikun Xu  
I think that's in real cases.

2:19:15.0 --> 2:19:15.870  
Haikun Xu  
Let's comes.

2:19:17.50 --> 2:19:19.820  
Haikun Xu  
Yeah, not on whether uh in real cases with.

2:19:20.790 --> 2:19:28.840  
Haikun Xu  
Mormede model misspecifications the difference between these two will be smaller because the Francis waits for length comes.

2:19:29.540 --> 2:19:30.450  
Haikun Xu  
Tend to be lower.

2:19:34.740 --> 2:19:36.90  
Haikun Xu  
Did I answer your question?

2:19:44.130 --> 2:19:59.800  
Fu, Dan (NFITD)  
Yes, I mean, this case, obviously you did. The detailed comparison to look at effects of different different approach. I'm I'm sure you also have some idea, which methods is you know you think will be provide a better lens com.

2:20:2.90 --> 2:20:6.40  
Fu, Dan (NFITD)  
Yeah, and that sense, I think I answer my question what I'm saying is you know because in.

2:20:7.380 --> 2:20:23.850  
Fu, Dan (NFITD)  
If you're doing assessment if you I I I believe if you tends to in a lot of cases. Yeah, I think you end up with putting a a little weight, putting a lot less weight to the landscape, especially if they are conflicting with other data then I think those difference probably tends to starts to you know.

2:20:24.680 --> 2:20:25.160  
Fu, Dan (NFITD)  
Umm.

2:20:26.670 --> 2:20:29.940  
Fu, Dan (NFITD)  
Reduced or or or disappear if I if I put it that way.

2:20:31.580 --> 2:20:44.810  
Fu, Dan (NFITD)  
Yeah, I was just wondering whether that's whether that's just obviously it's it's it's it's a sensible thing to do it's just whether that's something you would put a It is that something important to consider in.

2:20:45.520 --> 2:20:47.870  
Fu, Dan (NFITD)  
In practice that that's that's thank you.

2:20:48.710 --> 2:20:57.40  
Haikun Xu  
Yeah, and for that to answer that question, we can look at this profile several in our big assessment.

2:20:57.940 --> 2:21:0.370  
Haikun Xu  
Uh we use, Francis in the real world statement.

2:21:1.170 --> 2:21:6.440  
Haikun Xu  
We use the Francis wait for length conversations, and we still find.

2:21:7.670 --> 2:21:8.790  
Haikun Xu  
Fisheries last comes.

2:21:9.700 --> 2:21:11.540  
Haikun Xu  
Is among the most important?

2:21:12.590 --> 2:21:14.140  
Haikun Xu  
Uh component.

2:21:14.910 --> 2:21:27.90  
Haikun Xu  
To determine the estimate of R0, so I think we can use this profile are they likely profile to check how important feature that comes is.

2:21:29.80 --> 2:21:31.530  
Haikun Xu  
And that can give you also idea.

2:21:32.620 --> 2:21:33.30  
Haikun Xu  
Like.

2:21:33.890 --> 2:21:35.320  
Haikun Xu  
How important it is to?

2:21:37.450 --> 2:21:43.560  
Haikun Xu  
Research regarding like different method to ask me fish based length comps.

2:21:46.520 --> 2:21:52.450  
Haikun Xu  
At least in this case, it seemed to be especially stance comes sending me quite influential.

2:21:57.540 --> 2:21:59.240  
Haikun Xu  
But it may not be in other cases.

2:22:10.160 --> 2:22:13.690  
Aaron Berger (Guest)  
OK thanks for the question Dan Let's go over to Simon. It's got a question.

2:22:19.220 --> 2:22:24.790  
Simon Hoyle  
Yeah, thanks like Kern that's some that's really interesting work I I'm good to see the.

2:22:25.950 --> 2:22:27.780  
Simon Hoyle  
But that rewriting process having such a.

2:22:28.450 --> 2:22:28.750  
Simon Hoyle  
Uh.

2:22:30.90 --> 2:22:35.100  
Simon Hoyle  
An impact in the way that you would hope it would have on the results. I was I was wondering about.

2:22:37.850 --> 2:22:47.20  
Simon Hoyle  
I'm varying selectivity. I'm just a clarification question really whether you implemented that because if you've got catch weighted.

2:22:47.950 --> 2:22:54.900  
Simon Hoyle  
Compositions and the catch moves around from time to time, and there's some spatial variation in the sizes then.

2:22:55.740 --> 2:22:57.140  
Simon Hoyle  
Given the way the catch is not.

2:22:57.960 --> 2:23:3.670  
Simon Hoyle  
Stable through time you would expect selectivity to change as well. So so did you have?

2:23:4.860 --> 2:23:15.210  
Simon Hoyle  
Uh time brings selectivity estimated for the person fisheries and if you didn't do you think it might help if you did include that.

2:23:17.290 --> 2:23:23.370  
Haikun Xu  
Uh yes, it's a great question, yeah, even like when we use cache weighted that counts.

2:23:24.430 --> 2:23:42.980  
Haikun Xu  
We can have time varying selectivity, even the contact workers connectivity is highly variant because the distribution of cash and change or time and my my answer is that we, we haven't looked at that yet the time variance selectivity.

2:23:44.140 --> 2:23:45.560  
Haikun Xu  
When we say it's because.

2:23:46.560 --> 2:23:53.620  
Haikun Xu  
With think if it is possible for to do it for like a single replicate but impossible to find a objective way.

2:23:55.370 --> 2:23:58.580  
Haikun Xu  
It to like to do that for the hunger replicates.

2:23:59.700 --> 2:24:2.60  
Haikun Xu  
So we didn't explore that yet but.

2:24:3.140 --> 2:24:3.720  
Haikun Xu  
Uh.

2:24:4.630 --> 2:24:5.900  
Haikun Xu  
Is a good suggestion?

2:24:6.720 --> 2:24:10.970  
Haikun Xu  
Well, yeah, we, we will take a look at the fit to the.

2:24:12.250 --> 2:24:12.980  
Haikun Xu  
Mainland.

2:24:13.740 --> 2:24:15.80  
Haikun Xu  
By three three feet.

2:24:15.960 --> 2:24:25.370  
Haikun Xu  
And in that way we can see whether there could be a change in selectivity ohh selectivity for the social person feature.

2:24:28.70 --> 2:24:32.290  
Haikun Xu  
Something I will take a note to look at after this presentation. Thank you.

2:24:38.570 --> 2:24:40.320  
Aaron Berger (Guest)  
Yeah, go ahead, Dan Gathol.

2:24:41.570 --> 2:24:52.660  
Dan (Guest)  
Yeah, I just wanted to circle back. You you mentioned that the you know the data sample sizes for the length come by area. We're pretty sparse, which has come up a couple times.

2:24:54.500 --> 2:25:24.750  
Dan (Guest)  
And that you had a little bit of trouble with the regression tree approach. Given the sparseness of the data. So I was wondering if you could talk about you know roughly maybe like a rule of thumb like how much length comp data. You need to adequately implement this approach and whether you think that the simulated data here was kind of more sparse than you'd actually see in the real world or if it was kind of you know reflected what you'd expect and you know how that influences your model results or whether you can apply this approach.

2:25:24.880 --> 2:25:25.170  
Dan (Guest)  
Thanks.

2:25:26.970 --> 2:25:27.550  
Haikun Xu  
Uh.

2:25:28.350 --> 2:25:33.770  
Haikun Xu  
And you then for your question uh. I don't have a rule song for that, but I think at least.

2:25:34.980 --> 2:25:36.310  
Haikun Xu  
5. By 5 is.

2:25:37.730 --> 2:25:41.360  
Haikun Xu  
The minimum spatial resolution required to.

2:25:42.50 --> 2:25:44.30  
Haikun Xu  
To use the requiring tree approach.

2:25:45.160 --> 2:25:49.290  
Haikun Xu  
It's a 10 by 22, two spars and like.

2:25:50.550 --> 2:25:57.590  
Haikun Xu  
It's even difficult of like even we know it's between like 10 and 20 or 301030.

2:25:58.560 --> 2:26:9.120  
Haikun Xu  
And when you when you when you determine it's the space would be at 15 or 20 or 25, so at least five by five data like the person that comes.

2:26:10.890 --> 2:26:21.210  
Haikun Xu  
Is to be the minimum spatial relation required to use the regarding 3 approach and another thing to consider is the number of.

2:26:22.630 --> 2:26:25.480  
Haikun Xu  
This sample for each cell so uh in.

2:26:26.240 --> 2:26:27.670  
Haikun Xu  
In the simulation is fired.

2:26:29.30 --> 2:26:29.920  
Haikun Xu  
Ohh.

2:26:31.30 --> 2:26:32.960  
Haikun Xu  
The more the better, but

2:26:34.170 --> 2:26:35.760  
Haikun Xu  
are they seeing this case by.

2:26:37.470 --> 2:26:41.420  
Haikun Xu  
Is enough to show a stable and reliable?

2:26:42.330 --> 2:26:44.40  
Haikun Xu  
3:50, please.

2:26:50.900 --> 2:26:54.700  
Haikun Xu  
In in England real world when we apply this to a real world data.

2:26:57.430 --> 2:27:3.520  
Haikun Xu  
We'll EPO is the data is 5 by 5 and the sample size is.

2:27:4.250 --> 2:27:11.640  
Haikun Xu  
Hire them, but it's not effective sample size, but the real sample size is much higher than five for each grid cell.

2:27:22.930 --> 2:27:23.820  
Aaron Berger (Guest)  
Yeah, Mark go ahead.

2:27:27.840 --> 2:27:37.690  
Mark Maunder  
Yeah, I gotta related question not necessarily from for Haikun, but a haikun can you put up the bit to the long line link frequency data?

2:27:39.150 --> 2:27:41.600  
Mark Maunder  
And we saw this also in in.

2:27:42.160 --> 2:27:47.320  
Haikun Xu  
Sorry longline landscaping, there, the last cost Ohio.

2:27:44.980 --> 2:28:2.490  
Mark Maunder  
Yeah, the fit, yeah, the link won't fit, yeah, so we saw this in Jeremy's presentation, too, where there's a a. A bimodal distribution in there and is this. This is the service. This is the survey data so this is spatially weighted.

2:28:3.550 --> 2:28:5.170  
Mark Maunder  
Umm so.

2:28:7.400 --> 2:28:10.330  
Mark Maunder  
We would have thought that we would have got rid of any.

2:28:12.60 --> 2:28:14.310  
Mark Maunder  
Issues with with you know.

2:28:15.310 --> 2:28:18.10  
Mark Maunder  
Of variation and space in terms of effort.

2:28:19.280 --> 2:28:38.450  
Mark Maunder  
Because you're waiting at by the CPUE so you wouldn't have expected this distribution to be bimodal unless there was two populations that had completely different growth rates or something like that. I'm guessing so I I don't know what? What is causing this in this particular data set but we also saw it in the?

2:28:39.300 --> 2:28:45.760  
Mark Maunder  
Jeremy's one which presumably was the either the samples samples or the OR the catch weighted.

2:28:46.500 --> 2:28:47.760  
Mark Maunder  
Uh link frequencies.

2:28:48.720 --> 2:29:3.10  
Mark Maunder  
Umm so I don't know if this is spatial or what it is, but because this particular data set is is weighted by the CPUE in each area. Then you wouldn't have thought that the spatial impact would have been here unless this.

2:29:3.850 --> 2:29:8.280  
Mark Maunder  
You know, some weird thing of bosses due to sample sizes or something going on.

2:29:9.530 --> 2:29:15.200  
Mark Maunder  
So I was just wondering if anyone has any ideas about why we're seeing this and what what we should do to solve it.

2:29:25.70 --> 2:29:34.890  
Dan (Guest)  
I mean, I wonder if it has to do with the differences in recruitment across across areas not to give too much away in terms of the the simulation model.

2:29:35.940 --> 2:29:37.240  
Dan (Guest)  
But I'm not 100% sure.

2:29:41.840 --> 2:29:42.610  
Haikun Xu  
I can't.

2:29:43.590 --> 2:29:48.380  
Haikun Xu  
Castro, the map the speaker now but remember for the.

2:29:49.750 --> 2:29:54.440  
Haikun Xu  
Sample size every sample size equal 25 case, if it's much better.

2:29:58.60 --> 2:29:59.970  
Haikun Xu  
I cannot remember exactly what?

2:30:1.220 --> 2:30:3.470  
Haikun Xu  
This bimodal pattern looks like.

2:30:11.700 --> 2:30:15.990  
Aaron Berger (Guest)  
So just to repeat that icon you said when you ran the same.

2:30:18.140 --> 2:30:23.90  
Aaron Berger (Guest)  
Same model, but with the data set that had a effective sample size of 25.

2:30:24.760 --> 2:30:27.410  
Aaron Berger (Guest)  
Instead of five that pattern.

2:30:28.700 --> 2:30:31.630  
Aaron Berger (Guest)  
Disappeared or was was less less less stark.

2:30:31.300 --> 2:30:39.60  
Haikun Xu  
Very yummy is last but OK if you guys. Give me 30 seconds, I can pull that figure out.

2:30:46.190 --> 2:30:46.940  
Aaron Berger (Guest)  
OK.

2:30:46.170 --> 2:30:50.950  
Carolina Minte-Vera  
Well haikun is look for the Aaron can I ask you a question clarifications.

2:30:52.760 --> 2:30:53.630  
Aaron Berger (Guest)  
Yes, please go ahead.

2:30:53.170 --> 2:30:57.940  
Carolina Minte-Vera  
So I don't know if you can reveal that but what is the origin of the?

2:30:59.240 --> 2:31:5.750  
Carolina Minte-Vera  
Long line length frequency is based on one fleet 11 flag or

2:31:6.780 --> 2:31:7.450  
Carolina Minte-Vera  
or several.

2:31:8.780 --> 2:31:10.30  
Haikun Xu  
UH-1 flag.

2:31:12.660 --> 2:31:16.540  
Carolina Minte-Vera  
OK so everything comes from one flag.

2:31:19.770 --> 2:31:21.610  
Carolina Minte-Vera  
In in the real world.

2:31:23.880 --> 2:31:24.160  
Carolina Minte-Vera  
Like.

2:31:23.460 --> 2:31:27.510  
Haikun Xu  
On I think so, but I think Simon is the.

2:31:28.250 --> 2:31:29.650  
Haikun Xu  
Right person to answer this.

2:31:30.450 --> 2:31:31.60  
Haikun Xu  
Passion.

2:31:30.580 --> 2:31:33.440  
Simon Hoyle  
Yeah, it's it's simulated from.

2:31:35.20 --> 2:31:37.630  
Simon Hoyle  
One fishery with a constant selectivity.

2:31:38.70 --> 2:31:38.520  
Simon Hoyle  
Umm.

2:31:40.130 --> 2:31:42.860  
Simon Hoyle  
In the real world, it's based on.

2:31:43.640 --> 2:31:48.640  
Simon Hoyle  
I can't remember but I don't think that really matters. I I think it. I think it's fitted to.

2:31:51.30 --> 2:31:54.380  
Simon Hoyle  
Yeah, the it's got stable selectivity through space so.

2:31:55.580 --> 2:32:7.600  
Carolina Minte-Vera  
Now I was wondering if like if different nations have different ways of sampling the fish like some with observers other with the you know the features if that could cause the bias.

2:32:8.500 --> 2:32:9.610  
Carolina Minte-Vera  
In some data set.

2:32:17.640 --> 2:32:18.80  
Carolina Minte-Vera  
OK.

2:32:18.790 --> 2:32:19.440  
Carolina Minte-Vera  
Umm.

2:32:8.810 --> 2:32:21.140  
Simon Hoyle  
They may do but no that wouldn't come through into the simulation because the simulation has the same selectivity everywhere. It's just based on the combination of the the population and the and that selectivity.

2:32:22.750 --> 2:32:23.790  
Carolina Minte-Vera  
Hmm OK.

2:32:28.30 --> 2:32:30.190  
Haikun Xu  
Yeah, so the primal patterns still exist.

2:32:31.830 --> 2:32:36.620  
Haikun Xu  
When using a higher when using higher ESS case.

2:32:40.550 --> 2:32:43.420  
Simon Hoyle  
Did you look at the case I can with that has?

2:32:51.260 --> 2:32:52.450  
Haikun Xu  
Ohh no.

2:32:45.280 --> 2:32:53.570  
Simon Hoyle  
The observed like it, which which has a lot higher sample sizes. That's the there were the three cases there's the 5:25 and then the observed.

2:32:54.920 --> 2:32:56.190  
Haikun Xu  
No, I didn't look at that.

2:32:57.50 --> 2:32:57.550  
Haikun Xu  
Yet.

2:33:8.710 --> 2:33:18.720  
Jeremy McKenzie  
Alright somebody you thinking that this is a sample size issue because I don't believe that bone made out, I'll let you go away. It just smooth it a bit.

2:33:21.450 --> 2:33:22.460  
Haikun Xu  
And it's still there.

2:33:24.830 --> 2:33:26.160  
Simon Hoyle  
Yeah, it's still there, I'm.

2:33:28.90 --> 2:33:35.840  
Simon Hoyle  
Yeah, I'll look into it have a look at the at the data and see if I can work out where it might be coming from.

2:33:42.660 --> 2:33:43.390  
Simon Hoyle  
But not today.

2:33:53.860 --> 2:34:0.260  
Aaron Berger (Guest)  
Yeah, well. Mark had a nice segue into our our final part of today's webinar, which is a more broad discussion.

2:34:1.940 --> 2:34:9.820  
Aaron Berger (Guest)  
You know linking things we've seen between tycoons and Jeremy's presentation or other types of things, even those that we mentioned in the introduction about.

2:34:10.990 --> 2:34:14.960  
Aaron Berger (Guest)  
I spatial models in general, so we can continue with questions.

2:34:16.160 --> 2:34:21.460  
Aaron Berger (Guest)  
For presenter presenters themselves or more broad discussion.

2:34:34.130 --> 2:34:35.350  
Aaron Berger (Guest)  
Yeah, go ahead, Dan Phil.

2:34:37.860 --> 2:34:40.750  
Fu, Dan (NFITD)  
Yeah, I have a quick question regarding the.

2:34:41.740 --> 2:34:43.900  
Fu, Dan (NFITD)  
They sought under this area.

2:34:44.680 --> 2:34:56.300  
Fu, Dan (NFITD)  
Are we fleet as the area approach? I know both teams have used this approach and talk a lot about this method that seems to be a preferred ways to doing this? When you

2:34:57.10 --> 2:35:1.170  
Fu, Dan (NFITD)  
doing a single area model, but we do say that.

2:35:2.410 --> 2:35:21.610  
Fu, Dan (NFITD)  
I don't have much experience with this approach, but from what I did on it, it seems when you have different fleets as different fleets. Different surveys, which have different trends. This approach doesn't really count account for that difference of different trends of those different CPUE by simply using?

2:35:22.810 --> 2:35:37.990  
Fu, Dan (NFITD)  
You know there's difference in selectivity that's the only ways to explain those differences, so you basically ended up quite bad face to some of those indices that was wondering whether I mean, if people have thought about if that's the case. Whether a better way of you know it's to using?

2:35:39.30 --> 2:35:46.840  
Fu, Dan (NFITD)  
A combined indices of some sorts you know like in this simulation exercise, we did. Obviously, we did.

2:35:48.340 --> 2:36:5.40  
Fu, Dan (NFITD)  
The The The organizer provided us with this combined indices we can, we can, we use it. But in in. In reality when we dealing with the spatial model where we have to use areas fleet as area approach and dealing with conflict indices whether.

2:36:6.50 --> 2:36:13.460  
Fu, Dan (NFITD)  
A better approach would be to combine those indices outside the model some way and fitting it. Yeah, that's would be a?

2:36:14.660 --> 2:36:22.930  
Fu, Dan (NFITD)  
Be my question or thought whether if people have a have any feeling in terms of what would be a better way to to deal with this, this, this problem.

2:36:23.510 --> 2:36:24.160  
Fu, Dan (NFITD)  
Umm.

2:36:25.200 --> 2:36:33.770  
Fu, Dan (NFITD)  
I read another question related to this fleets as area approaches against for my own benefit because I've been thinking about.

2:36:34.460 --> 2:36:38.10  
Fu, Dan (NFITD)  
When you have those using this approach and you have.

2:36:39.550 --> 2:36:47.780  
Fu, Dan (NFITD)  
You know because of your different fisheries are always operated locally on so the selectivity is always going to be.

2:36:48.910 --> 2:36:56.670  
Fu, Dan (NFITD)  
But whereas the model is is you cover. The whole population, so the selectivity in theory, should all be don't shaped right.

2:36:57.790 --> 2:36:58.290  
Fu, Dan (NFITD)  
But.

2:36:59.680 --> 2:37:9.640  
Fu, Dan (NFITD)  
When you doing this model, you have to use for some of the fleets. It seems you have to use a a semantic asymptotic selectivity. Otherwise, you end up having.

2:37:9.720 --> 2:37:13.200  
Fu, Dan (NFITD)  
Umm you know in scripted biomass.

2:37:13.890 --> 2:37:17.30  
Fu, Dan (NFITD)  
I was wondering if people have any experience of.

2:37:17.740 --> 2:37:33.510  
Fu, Dan (NFITD)  
Dealing with how how how the selectivity are handled in those cases in those studies. We've been discussing before whether you have to because in Syria. I was feeling seems to be all the feature you have to use don't ships and activity if you use this approach.

2:37:34.310 --> 2:37:50.440  
Fu, Dan (NFITD)  
But that obviously won't work because you have to use the asymptotic for for for for some fishery. I was wondering if that's that's going to be an issue. Sorry just those two questions that coming off my head. I'm it's not didn't say clear thank you.

2:37:57.200 --> 2:38:1.30  
Haikun Xu  
This is a question for us or for everyone.

2:38:2.40 --> 2:38:4.660  
Haikun Xu  
OK, in other words should I answer it or.

2:38:5.180 --> 2:38:14.10  
Fu, Dan (NFITD)  
Yeah, yeah, probably for people who are familiar with the with the with this approach. It seems to be that has been used here and I I've been using it.

2:38:14.990 --> 2:38:23.960  
Fu, Dan (NFITD)  
For you know the IOTC team when we're doing this we, we, we tried. This, as well as as one of the so those are the things that does come.

2:38:25.310 --> 2:38:30.220  
Fu, Dan (NFITD)  
Come to to my head basically you know you do, I have to put?

2:38:31.640 --> 2:38:41.150  
Fu, Dan (NFITD)  
You know the single when when obviously you have to maintain the fleet structure but do you put a single indices or you put 4 indices and and you can try both to see what the difference?

2:38:41.920 --> 2:38:51.260  
Fu, Dan (NFITD)  
But what would be a a better approach do you have any general guidelines or we have any general guidelines and and what will be the selectivity options for?

2:38:51.950 --> 2:38:52.910  
Fu, Dan (NFITD)  
For.

2:38:54.60 --> 2:39:9.390  
Fu, Dan (NFITD)  
For each of those fleets. I mean, my case, obviously, when I doing this for the long lines that catch large fish. I just put logistic selectivity. But we know those longline operator locally, they so the so, so a lot of part of the population.

2:39:10.370 --> 2:39:25.770  
Fu, Dan (NFITD)  
It's not visible to it if you use fleta 0 approach so it seems you should you are supposed to use a Dome shape selectivity so I will I seems to be a dilemma to me. So I don't know. I don't have answer for for that. Whether that's something people still have to think about.

2:39:29.490 --> 2:39:34.560  
Haikun Xu  
All these things I'm still sharing my slides because answer it first.

2:39:36.630 --> 2:39:37.20  
Haikun Xu  
Ah.

2:39:36.960 --> 2:39:42.80  
Aaron Berger (Guest)  
Yeah, why don't you go ahead haikun and then we have a mark and Maunder and then followed by Rick Methot?

2:39:43.410 --> 2:39:44.480  
Haikun Xu  
OK, thank you.

2:39:45.120 --> 2:39:50.790  
Haikun Xu  
Ohh, allowing me to speak first so I will start from the 2nd.

2:39:51.830 --> 2:39:53.240  
Haikun Xu  
Question about selectivity.

2:39:54.340 --> 2:39:59.180  
Haikun Xu  
In this case, we, we soon that selectivity for all Fisheries.

2:40:0.40 --> 2:40:2.390  
Haikun Xu  
I don't shaped including ones for longline.

2:40:3.350 --> 2:40:5.200  
Haikun Xu  
But because the

2:40:5.780 --> 2:40:7.280  
Haikun Xu  
ohh that's

2:40:8.10 --> 2:40:10.690  
Haikun Xu  
service length counts have been standardized.

2:40:11.420 --> 2:40:13.230  
Haikun Xu  
Using CPUE weighted.

2:40:13.990 --> 2:40:15.540  
Haikun Xu  
Uh that's nice frequency.

2:40:16.540 --> 2:40:26.400  
Haikun Xu  
So, we, we think it's properly to use logistic asymptotic selectivity for the service fleet because it should represent.

2:40:27.70 --> 2:40:29.900  
Haikun Xu  
Uh clear on contact selectivity.

2:40:31.90 --> 2:40:33.340  
Haikun Xu  
Is this how we specify the selectivity?

2:40:34.230 --> 2:40:36.580  
Haikun Xu  
At least for this simulation experiment.

2:40:37.750 --> 2:40:43.720  
Haikun Xu  
And you're right like some papers had mentioned that even with the asymptotic.

2:40:45.670 --> 2:40:51.170  
Haikun Xu  
Contacts that activity is the fisheries like you can still be done tripped based on distribution cache.

2:40:52.40 --> 2:40:55.310  
Haikun Xu  
And or fishing what mortality.

2:40:56.810 --> 2:41:0.680  
Haikun Xu  
Uh and to answer your first.

2:41:3.610 --> 2:41:7.420  
Haikun Xu  
First question bought the C CPUE and go back.

2:41:11.150 --> 2:41:15.700  
Haikun Xu  
All the CPUE uh so we only fix.

2:41:17.0 --> 2:41:20.830  
Haikun Xu  
The model to a single CPUE time series that.

2:41:21.830 --> 2:41:27.940  
Haikun Xu  
Is is computed using VAST so it's an error weighted index for the entire Indian Ocean?

2:41:28.700 --> 2:41:30.640  
Haikun Xu  
We you do that because.

2:41:31.290 --> 2:41:42.750  
Haikun Xu  
No if this is a single area, or this is not speech restructured stock size model so the index balance should represent population trend as.

2:41:43.750 --> 2:41:47.40  
Haikun Xu  
And population trends for the entire region.

2:41:48.460 --> 2:41:54.320  
Haikun Xu  
Assuming it well mixed so that's why we only fit to one single index of abundance.

2:41:56.50 --> 2:41:59.40  
Haikun Xu  
Ohh is elevated for the entire region.

2:42:0.250 --> 2:42:4.460  
Haikun Xu  
And yeah, you are right different regions can have different.

2:42:4.970 --> 2:42:9.690  
Haikun Xu  
Ohh index index trends they could be a lot of things like.

2:42:10.920 --> 2:42:17.490  
Haikun Xu  
Uh regional recruitment movement like our fishing metallic that's why we think.

2:42:18.270 --> 2:42:19.770  
Haikun Xu  
In all approach using?

2:42:21.60 --> 2:42:22.340  
Haikun Xu  
Uh standardized.

2:42:24.280 --> 2:42:27.250  
Haikun Xu  
And we add a survey and and A standardize CPUE.

2:42:28.590 --> 2:42:35.520  
Haikun Xu  
It's more properly than beating to region, regional specific indices or boundaries.

2:42:36.730 --> 2:42:37.700  
Haikun Xu  
OK, I'll

2:42:38.890 --> 2:42:40.840  
Haikun Xu  
I will stop now stop here.

2:42:45.220 --> 2:43:2.310  
Rick Methot (Guest)  
Yeah, I could have very much support. That approach is Rick Methot and I I should be writing my CAPAM talk on selectivity, but it's more important to be listening. To this discussion on spatial selectivity because that's basically what I'm writing into my presentation to cap them.

2:43:3.310 --> 2:43:14.820  
Rick Methot (Guest)  
I I'm sorry I missed the beginning of your talk were you able to do spatial weighting on the length composition that is associated with the CPUE index that is across areas.

2:43:25.360 --> 2:43:27.0  
Aaron Berger (Guest)  
Nope, like I couldn't you're still on mute.

2:43:27.500 --> 2:43:30.170  
Rick Methot (Guest)  
OK, yeah, OK I see what you did that's great.

2:43:31.10 --> 2:43:33.610  
Rick Methot (Guest)  
Look forward to looking reviewing it later thank you.

2:43:40.130 --> 2:43:43.990  
Aaron Berger (Guest)  
OK, Mark you have your hand up and then after that, we'll go to Simon.

2:43:46.290 --> 2:44:6.970  
Mark Maunder  
Yeah, so haikun basically answered the questions so I just wanna reiterate that the reason for using this approach is actually to solve the the the issues that Dan brought up so you know. Basically, the The Dome shape selectivity issue and the multiple indices from different areas, conflicting with each other.

2:44:8.490 --> 2:44:20.850  
Mark Maunder  
But I also want to add to that with the combining indices together and so I couldn't has done that in some examples where he adds.

2:44:21.540 --> 2:44:39.600  
Mark Maunder  
The Korean and the Japanese fleets together to try and increase the spatial coverage because you wanna have actual information for the whole area because you're wanting an index of the whole population and so you wanna get a good spatial coverage. Now, if I remember correctly when he does that.

2:44:40.710 --> 2:44:49.940  
Mark Maunder  
We're making the assumption that they have the same excuse me catchability and selectivity right, but it might be possible that they have actually different.

2:44:50.910 --> 2:44:59.510  
Mark Maunder  
Umm selectivity and Catchability and we haven't I don't think we've done a vast model where we've actually tried to estimate the?

2:45:0.320 --> 2:45:5.80  
Mark Maunder  
Selectivity or at least the relative selectivity among gears within the same model.

2:45:5.990 --> 2:45:17.430  
Mark Maunder  
Umm but it should be possible, possibly with some extra coding, it to to VAST to do that. And if you have good spatial overlap, then you might be able to do that and so.

2:45:18.440 --> 2:45:33.90  
Mark Maunder  
That's something that's worth considering, particularly if the gears are are are quite different than you wanna increase the spatial coverage for the long line gears are hopefully somewhat similar so. Maybe it's not of important but you know, maybe if you had like the Spanish.

2:45:35.290 --> 2:45:46.950  
Mark Maunder  
Swordfish gave versus the Japanese you know big eye gear, or something like that. Then you might have a big problem and you would actually have to try and deal with the selectivity and catchability more.

2:45:59.30 --> 2:46:5.600  
Simon Hoyle  
Yeah, just following up on that certainly from looking at standardizing size data for the long line fishery.

2:46:7.190 --> 2:46:12.340  
Simon Hoyle  
It doesn't seem to be a big problem, having different fleets in the long line because.

2:46:14.170 --> 2:46:24.440  
Simon Hoyle  
The the components that contribute to sizes and I mean, it's mostly time. It's partly space and to a lesser extent in my experience as a lesser extent it's the fleet.

2:46:25.80 --> 2:46:26.250  
Simon Hoyle  
Umm but I

2:46:27.240 --> 2:46:34.190  
Simon Hoyle  
yeah, flipping much smaller component, but I just wanted to my question for Kern was about.

2:46:35.480 --> 2:46:39.900  
Simon Hoyle  
Having the selectivity on the survey fleet being logistic and.

2:46:41.190 --> 2:46:44.680  
Simon Hoyle  
I'm just wondering whether that's necessarily the case because.

2:46:45.730 --> 2:46:46.120  
Simon Hoyle  
If.

2:46:47.160 --> 2:46:48.410  
Simon Hoyle  
It depends where?

2:46:49.380 --> 2:46:54.10  
Simon Hoyle  
I guess the abundance is concentrated if that's where the largest fish are if the largest fish tend to hang out.

2:46:55.110 --> 2:46:57.840  
Simon Hoyle  
Places where the the abundance isn't the highest then.

2:46:59.350 --> 2:47:0.510  
Simon Hoyle  
You might not get that.

2:47:1.690 --> 2:47:3.500  
Simon Hoyle  
Let's just take selectivity and I.

2:47:4.470 --> 2:47:14.570  
Simon Hoyle  
Have have you tried running the model without logistics selectivity and and having Dome shaped on everything and and how does that go thanks?

2:47:17.460 --> 2:47:18.760  
Haikun Xu  
OK, Stevens thank you.

2:47:20.690 --> 2:47:24.280  
Haikun Xu  
Thank you for your question well, yes, you're right if.

2:47:25.810 --> 2:47:46.30  
Haikun Xu  
Like other setting my presentation, though, is the approach standardization is limited by this special coverage of the data if like large fish move out of the something region. You maybe you can you can get Dom ships like even for 30 plate and I haven't tried?

2:47:46.770 --> 2:47:47.110  
Haikun Xu  
Like.

2:47:47.760 --> 2:47:57.670  
Haikun Xu  
Using Dom shapes likely for the survey flips yet, but I think the good suggestion. I need to explore and compare all the single replicate in a fast way.

2:47:58.830 --> 2:48:7.850  
Haikun Xu  
To see whether when we use don't don't shapes the activity for service whether the model estimate asymptotic or don't shift.

2:48:8.890 --> 2:48:10.900  
Haikun Xu  
I think it'd be interesting to take a look.

2:48:27.240 --> 2:48:28.850  
Mark Maunder  
The Aaron can I follow up on that.

2:48:29.570 --> 2:48:30.920  
Aaron Berger (Guest)  
Oh Yep sorry go ahead mark.

2:48:30.730 --> 2:48:38.460  
Mark Maunder  
Yeah, yeah, so I mean, it's an interesting question, so imon brings up and it's something that's kind of bothered me all the time as well.

2:48:39.170 --> 2:48:47.220  
Mark Maunder  
Umm you know with whether it's even if you do the spatial standardization and and waiting by the CPUE whether or not the.

2:48:48.60 --> 2:48:49.650  
Mark Maunder  
The selectivity should be.

2:48:50.920 --> 2:49:1.450  
Mark Maunder  
As metallic if the gear selectivity is if the contact selectivity is asymptotic and I think it should be because you know you're waiting by the CPUE obviously so it should be.

2:49:2.120 --> 2:49:3.520  
Mark Maunder  
It should be the.

2:49:5.160 --> 2:49:11.960  
Mark Maunder  
You know the population is being selected by that gear and and and so I think it's right, but I think what we have been.

2:49:13.20 --> 2:49:15.830  
Mark Maunder  
We've long runners is, is this a depth component.

2:49:16.880 --> 2:49:26.570  
Mark Maunder  
And we and why they actually be getting Dome shaped selectivity because of the depth differences in the size of Fish and so I don't I I don't think it's I mean?

2:49:27.620 --> 2:49:30.370  
Mark Maunder  
And I could be wrong, but I think theoretically I think.

2:49:31.210 --> 2:49:35.390  
Mark Maunder  
The spatial things OK, but I think the context selectivity.

2:49:36.470 --> 2:49:39.980  
Mark Maunder  
Is not necessarily asthmatic because of the depth?

2:49:40.630 --> 2:49:54.0  
Mark Maunder  
Distribution of the of the fish in that stance that we're not modelling that and so we're actually getting the bigger. Fisher, a deeper or lower and I think Haikun actually looked into that using archival tag data and we we found that.

2:49:56.0 --> 2:50:7.50  
Mark Maunder  
There was a there was a issue where I think the bigger fish weren't actually in the area where the most of the gear was fishing, but called haikun comment on and if he can remember.

2:50:10.420 --> 2:50:14.990  
Haikun Xu  
I yes uh the archival tagging data shows that.

2:50:16.10 --> 2:50:20.450  
Haikun Xu  
A very large fish tend to stay muscle time at very deep.

2:50:21.130 --> 2:50:28.390  
Haikun Xu  
Uh deep level and smaller fish cannot control their body temperature where well so they need to.

2:50:29.120 --> 2:50:36.530  
Haikun Xu  
Swing back to the surface, warm warmer surface layer to warm up their body, but they they tend to.

2:50:37.570 --> 2:50:47.180  
Haikun Xu  
Stay smaller they tend to stay in. In both shallow and deep layers. But for large space. They spend most of the time.

2:50:48.350 --> 2:50:52.100  
Haikun Xu  
Active players for for for food so.

2:50:53.150 --> 2:50:53.680  
Haikun Xu  
When the

2:50:54.470 --> 2:51:2.960  
Haikun Xu  
when folks cannot reach 30 part of the ocean in May cause asymptotic sorry don't shape selectivity.

2:51:4.530 --> 2:51:10.160  
Haikun Xu  
If that is the case so different size page have behaved differently and.

2:51:11.70 --> 2:51:15.300  
Haikun Xu  
Stay in different spent different proportion of time on at different.

2:51:15.830 --> 2:51:18.340  
Haikun Xu  
Ohh, that's helped mother column.

2:51:19.870 --> 2:51:21.220  
Mark Maunder  
Is that the guy or yellowfin?

2:51:22.270 --> 2:51:26.540  
Haikun Xu  
Of Big I was thinking, maybe the same for.

2:51:27.520 --> 2:51:37.390  
Haikun Xu  
Yellow painter just it's general like daughter field tend to spend more time to searching for food at deeper layer because they are capable of doing that for a long time.

2:51:45.0 --> 2:51:46.730  
Aaron Berger (Guest)  
Simon do you have a quick response to that?

2:51:47.520 --> 2:51:48.280  
Aaron Berger (Guest)  
Did you have your hand up?

2:51:52.330 --> 2:51:57.520  
Simon Hoyle  
Yeah, I did, but then I realized it wasn't really a special issue. So I thought I'd put my hand down.

2:51:59.150 --> 2:52:1.600  
Simon Hoyle  
But since I've been asked I mean, the the.

2:52:2.490 --> 2:52:10.590  
Simon Hoyle  
Thing I was thinking was that you might also have a behavioural difference in that you have the bold fish and the shy Fish and the.

2:52:11.260 --> 2:52:15.410  
Simon Hoyle  
The goldfish are gonna get caught first so that would tend to leave to.

2:52:17.810 --> 2:52:23.640  
Simon Hoyle  
A dime shapes selectivity, so I guess there are multiple reasons why you might theorize that there would be.

2:52:24.970 --> 2:52:31.420  
Simon Hoyle  
Timesheet selectivity, but of course, they don't occur in this SPM model.

2:52:32.40 --> 2:52:32.410  
Simon Hoyle  
Umm.

2:52:34.30 --> 2:52:34.600  
Simon Hoyle  
Yeah.

2:52:38.990 --> 2:52:57.490  
Aaron Berger (Guest)  
OK, well, I think it's getting close to the end of our time here. I think we cut it off for today. But I do want to mention you know, we've got a lot of interesting topics that came up today. I suspect well. In addition, giving Rick a bunch of things to think about for selectivity that we're going to revisit some of these as we move through this webinar series.

2:52:58.40 --> 2:53:28.730  
Aaron Berger (Guest)  
Umm I'm sure other teams are are working with these issues as well. So we'll have time to revisit the next time is the next webinar is November 21st. We have two teams presenting so we will have a little bit of more time for discussion open discussion next time so the the look forward to that also a reminder that the recording of this present or this webinar as well as the presentations. I'll send out a quick e-mail and where to find those at so you can have those.

2:53:28.880 --> 2:53:38.780  
Aaron Berger (Guest)  
And refer to them again and then just as a wrap up. I'd like to say say thanks to everybody for coming today to the presenters and their teams and to everybody that's contributed.

2:53:39.560 --> 2:53:53.290  
Aaron Berger (Guest)  
On behalf of the organizers thanks so much for attending and we look forward to seeing you at webinar 2 on the 21st of November, at least in the US time zone in about a month's time or so, so thank you everybody.

2:53:56.130 --> 2:53:57.540  
Jeremy McKenzie  
Thanks, everybody. Bye.

2:54:0.260 --> 2:54:1.550  
Haikun Xu  
Thank you everyone bye.

2:54:2.710 --> 2:54:3.680  
Pamela (Guest)  
Thank you.

2:54:9.820 --> 2:54:10.790  
Manuel Hidalgo (Invitado)  
Thank you anyway.

2:54:14.70 --> 2:54:14.620  
Fu, Dan (NFITD)  
Thank you.

2:54:29.450 --> 2:54:37.940  
Simon Hoyle  
The finishing just on exactly the right time, but I'm gonna stay on to see what happens if we run over time for next time just in case.

2:54:40.330 --> 2:54:49.100  
Aaron Berger (Guest)  
Sounds good and I think I I'm I'm gonna I've got something after this. I gotta get to but we can have a debrief and and think about you know.

2:54:50.210 --> 2:54:51.400  
Aaron Berger (Guest)  
About next month.

2:54:52.850 --> 2:54:54.180  
Aaron Berger (Guest)  
But no thanks everybody.

2:54:56.540 --> 2:54:57.420  
Aaron Berger (Guest)  
I think it went pretty well.

2:54:59.170 --> 2:55:0.240  
Simon Hoyle  
Yeah, it's very good.

2:55:1.660 --> 2:55:2.220  
Aaron Berger (Guest)  
OK. Bye.

2:55:3.400 --> 2:55:3.890  
Simon Hoyle  
Yeah.

2:55:3.460 --> 2:55:3.990  
Dan (Guest)  
Take it easy.