

Fisheries Management Law & Economics

Final Recap & Review

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Fisheries Technology

Outline

- Housekeeping
- Recap
- Questions???

Final This Week!

- Study guide – Available Tonight!
- Exam – Available Tomorrow 12/8
 - Review your old exams!
 - One week to complete
 - Due Wed 12/14 @ 5:00pm
- Exam Format – CUMULATIVE! 200 pts
 - Multiple choice, fill in blank, short essay
- Contact Instructional Services (eLearning Support) to schedule proctor

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Course Evaluations

- Please Fill Out!!

The screenshot shows a Blackboard course interface. On the left, a navigation menu lists various course elements, with 'Student Course Rating' circled in red. The main content area features a header for 'Fisheries Management Law & Economics' and an 'Announcements' section. A yellow 'Create Announcement' button is highlighted, with a red arrow pointing to an announcement titled 'Emerging Fisheries Management Techniques Assignment'. The announcement text includes a date, a greeting, and a reference to a discussion section. A 'Posted by' box on the right identifies the author as Joel Markis.

Fisheries Management Law & Economics

Announcements

New Announcements appear directly below the repositionable bar. Reorder by dragging announcements to new positions. Move priority announcements above the repositionable bar to pin them to the top of the list and prevent new announcements from superseding them. The order shown here is the order presented to students. Students do not see the bar and cannot reorder announcements.

Create Announcement

New announcements appear below this line

Emerging Fisheries Management Techniques Assignment

Posted on: Sunday, November 15, 2015 7:12:23 PM AKST

Hi Guys,

I have posted an example assignment for this week in the discussion section under [Emerging Fisheries Management Techniques](#). If you have any questions as always feel free to contact me.

Joel

Posted by: Joel Markis
Posted to: Fall-2015 FT272-T01 / FT272-TD1

Emerging Management Techniques

- Genetics in Fisheries Management
 - What is DNA?
 - What are Microsatellites? (SSR's)
 - Genes lie on strands of DNA
 - SNP's are single nucleotide mutations of (polymorphisms)
- With enough of these SNP's (which vary throughout populations) we can identify fishery stocks (or even single individuals if we use enough SNP's)
- This information
 - Allows for better targeting of fishery
 - Allows for more predictable forecasts
 - We can identify where fish were going if intercepted at high seas (chinook bound for Y/K)

Fisheries Observers

- What is a Fishery Observer?
- What do they do?
- What type of information do they collect?
- Issues
 - Recruitment and retention
 - Observer health and safety
 - Data accuracy, precision, and bias
 - Expensive
- Electronic Monitoring (EM)
 - Comprised of: Cameras, GPS, Magnetic rotation Sensor, Hydraulic pressure sensor
 - Collect: Data about catch and discards, Vessel location, Fishing activity
 - Pros: improved safety, 24 Hr operation, digital record, less bias, less expensive
 - Cons: Species identification, weight and biological sample collection, video review

Cool Stuff

- Cam Trawl (Video inside trawl net)
 - Potentially, computers identify species, estimate weight
- HabCam (towed video sled)
 - Video survey of benthic habitats (Primarily scallops)
 - Pros: Less damage to habitat, go over habitats you can't trawl
- Acoustics (Listening for fish or other species)
 - Fish make noises
 - Listening to Cod sex in the Atlantic
 - Sperm whales listen to noises (what are they listening for)
 - What do sperm whales do? (how do they interact with the fishery)
 - What are they cued into?
- Hydroacoustic Surveys (Sonar)
 - Used to estimate populations of cod and herring
 - Otherwise would have to trawl (reduce mortality and bycatch)
 - Can get biomass estimates

Cool Stuff 2

- Stationary Video Camera Array
 - 3D stereo camera arrays
 - survey fish populations on deep reef habitats
 - Difficult or destructive to survey using traditional means.
 - Determine fish lengths – make stock assessments.
- Autonomous Underwater Vehicle (AUV)
 - Can track fish species (collect WQ and all sorts of other data)
 - Sharks don't like
- Game of Drones
 - What are some of the benefits of drones?
 - What are some of the things we can look at using drones

PWS MGMT

- Central theme = to achieve a constant level of escapement regardless of run strength
- PWS Salmon is managed to meet escapement goals (these are ranges, high and low)
- Biological Escapement Goal (BEG) the escapement that provides the reatest potential for maximum sustained yield
 - BEG's are developed from the best available biological information and should be scientifically defensible on the basis of available biological information
- Sustainable Escapement Goal (SEG) the level of escapement, indicated by an index or an escapement estimate, that is known to provide for sustained yield over a 5 to 10 year period,
 - SEG's are used in situations where a BEG cannot be estimated (less data) (more conservative)
- Escapement goal ranges should allow for uncertainty in
 - Measurement techniques
 - Variability in assessments of stock size
 - Climate and oceanographic variability
 - Varying abundance of populations within stocks

PWS MGMT

PWS Stock Assessments - how many fish are there

3 techniques – all are estimates

Escapement - Weirs, towers (best), sonar, mark-recapture (good), aerial surveys (ok)

Harvest – or ‘catch’ measured using paper (or electronic) fish tickets from fisherman

Age Composition – primarily from scale samples (like tree rings)

- Know about scale ages

Test Fishery – Provides run strength info, Sex ratio, and stock composition (where are fish headed)

- Stock Assessments allow managers to set or fine tune Sustainable Escapement Goals (Usually Range)
- **Management is done using EO's**

Bering Sea King Crab

- Management is Cooperative between State and Feds
 - Feds develop regs and mgmt plans / conduct surveys
 - ADFG implements regs
 - BOF allocates resources
- 3 - S Harvest Strategy (sex, size, season)
 - Know the benefits of these
 - There are numerous other mgmt. measures used be generally familiar with these

Bering Sea King Crab

Know about pre 2005 management v.s after 2005 (what happened)

Rationalization

What is it and what are some pros and cons

Derby style before rationalization

Know some pros and cons of rationalization

- Pro – safer, less bycatch, better management, less ghost pots
- Cons – Less permits, less boats, less jobs, fairness, loss of lifestyle

Bering Sea King Crab

Crab Stock assessments

- Types of information – Life History, abundance, catch = stock status
- Trawl and pot surveys
- Types of biological data collected
 - Sex, size, shell condition (age)
 - Other data is also collected and goes into stock assessment model (observer, port sampler)
- Stock assessments allow managers to make population estimates and set harvest limits.
- Harvest limits are variable and based on biomass (more crabs = more harvest)

SE Sac Roe Herring

- Managed solely by the state ADF&G
- Numerous types of information go into assessments
 - Aerial Survey of Spawn
 - What's being mapped and how is it recorded?
- Spawn Deposition Dive Survey (Spawning biomass estimate)
 - How do they know where to dive
 - What are they looking for
- Samples for AWL

SE Sac Roe Herring

- Cast net samples
 - Provides estimate of spawning population age composition
- Commercial fishery samples
 - Where do these come from? What is measured
- Winter test fishery samples – error check of model performance
- Other – fecundity, juvenile sampling – lets managers know when roe is ripe

Information from assessment goes into ASA model (what's this)

- This gives a forecast and allows managers to set harvest limits

What management practices are used to regulate the fishery? (regulatory Framework)

Fisheries Economics

- **Economics is** - science that studies production, distribution and consumption of goods and services in an economy
- **Microeconomics** (small elements)
 - Basic elements in the economy
 - Individual agents and markets
 - Interactions (outcomes of interactions)
- **Macroeconomics** (large elements) Analyzes the entire economy
 - Taxation, Stimulus, Unemployment

Fisheries Economics

- **Law of Demand** - All else equal, as price of a product increases, quantity demanded falls
 - Inversely Related
 - Know graph and be able to draw
 - Be able to predict what will happen in different circumstances (demand will shift)
- **Law of Supply** All else equal, an increase in price results in an increase in quantity supplied
 - Positively related
 - Know graph and be able to draw
 - Be able to predict what will happen in different circumstances (supply will shift)

Fisheries Economics

- **Supply and demand** - both are related
 - Understand shortages and surpluses
 - Understand what equilibrium is and how economies move in this direction
 - Be able to predict how various fisheries related activities or changes will impact the supply and demand curves
- Rather than memorizing fisheries economic statistics be able to interpret the various charts and tables and imagine how they might be related
- **Crab Rationalization and Economics** – you should know a fair amount about this at this point and be able to identify the pros and cons and be able to point out the elements of rationalization
 - Who benefited?
 - what did rationalization change?
 - What does it do for management?

Fisheries Economics

- **Herring Economics**
 - No need to memorize economic statistics of herring in Sitka
 - Think about what rationalization of herring might look like
 - What would change? Who would benefit?
- **Salmon in Alaska**
 - Supply and it's impact on fish?
- **Good things in the future**
- **Global demand likely to grow**
 - Population Growth
 - Growing Incomes
 - Health Benefits of fish
- **Wild salmon are limited in supply**
 - Limits to farmed salmon growth
 - Disease problems
- **Limits to fish meal food sources**

Fisheries Economics

- **Challenges in the future**
 - Resource uncertainty
 - Farmed salmon flood markets
 - Other species compete with Alaskan (wild and farmed)
 - Economic uncertainty
- **Other fishery economics questions**
 - Marketing, hatcheries, management by economics etc..
 - Think how these topics might be influenced by or might influence economics.

Current Management Issues

- **Pebble Mine project**

- Large porphyry copper, gold, and molybdenum mineral deposit
- Located on state land in Bristol Bay near Lake Iliamna and Lake Clark
- Know a little about mining timelines in AK (10 – 15yrs before operation starts)

- **The Deposit**

- Broken into East and West deposits
- Ore typically contains < 1% copper by volume
- ~80 billion lbs of Copper, 5 b of Molybdenum and some gold

- **The Mine**

- 10.7 Billion tons of Ore proposed Biggest mine in AK by far!
- Footprint larger than Anchorage
- Open Pit style of mine
 - Know how this mining works
 - Tailings go into tailings dams (some are Large)

Current Management Issues

- Permitting
- Lots of organizations involved and permits required
- Pros & Cons to Pebble
- Know these
- Anti
 - Sustainable vs not
 - F&WL too important
 - Discharge of toxins
 - 75% of mines pollute
 - Owned by outside
 - Not that much tax revenue

Current Management Issues

- Pro
 - Tax revenue
 - Lots of jobs for construction & Operation
 - Provide domestic resources for manufacturing
 - New mining is safe
 - No net loss policy for fish
- Current status
 - On hold after losing funding late 2013
 - EPA imposed section 404 of Clean Water
- Tailings dam Failures
 - Mount Polly 2014
 - AFS issues statement in opposition

Current Management Issues

- **Adaptive / Co-Management**
 - Sharing management among user groups
- **Historical**
 - Closed systems
 - Managed in communities
 - Colonial power & lords led to gvmt mgmt. of community lands
- **Steps in Adaptive/Co-Management**
 - Bring together stakeholders
 - Set goals, objectives & Plan
 - Implement a plan
 - Monitor effectiveness
 - Re-evaluate & Start over

Current Management Issues

- Glen Canyon & Susitna Hydro projects
 - Who are users?
 - Applying adaptive management
- Groups involved in Adaptive management
 - Know some of these

Thank You !

- HAVE A GOOD BREAK!
- See you next Semester!!