#### FT 120 – Fisheries of Alaska



## Module Composition

**VgC** 

Fisheri

This module will cover five main areas:

- 1. Types of Fish in Alaska
- 2. Types of fishing vessels and fisheries
- 3. General fish biology
- 4. Location and timing of fishing activities
- 5. Economics and Market information

When viewing recorded lectures, the slides will automatically advance. The Prev and Next buttons are available but it is recommended you listen and view the recorded lectures in auto mode. You can return to the main menu of the recorded lectures by tapping the recorded lecture icon (speaker).

Home

Presentations

Video Resources Ouestions

Readings

At the end of each of the areas there are self-check quizzes to make sure that you understand the basic student learning outcomes for each area.

## Student Learning Outcomes

## By the end of this module you should be able to:

- List and differentiate the various important fish species of Alaska
- List and differentiate the various types of Alaskan fisheries and fishing vessels

- Describe various aspects of fish biology to include: growth, reproduction, ecology and others
- Identify various external and internal anatomical features of fish
- Identify the various fishing regions across Alaska
- Describe the seasonality of fisheries throughout Alaska
- Describe the basic concepts of the economic value of Alaskan fisheries

## Readings







Read pp53-74 in Intro to Fish.pdf in iBooks

#### Presentations







Joel Markis - UAS Assistant Professor

11 Groups of Important Alaskan Fish (15 minutes)

Alaskan Fisheries Vessels (35 minutes)

General Biology of Fishes (30 minutes)

Fishing Locations and Timing (15 minutes) What Fisheries Bring to the Alaskan Economy

## 

#### Joel Markis

Assistant Professor Fisheries Technology University of Alaska Southeast

Growing up in Southcentral Alaska Joel was continuously exposed to the outdoors and fisheries. After graduating from Bartlett High school in Anchorage, he pursued a growing passion for fisheries by attending Montana State University in Bozeman, MT where he received a B.S. in Fish and Wildlife Management while honing his skiing and fly fishing

skills. This newfound knowledge allowed Joel to work various fisheries jobs all over Alaska, traveling to exotic places all while under the context of 'work'. After spending time in places like Katmai, Aniakchak, Kenai Fjords, Denali, The Tongass and Wrangell St. Elias he decided to pursue a graduate degree in Marine Biology from the University of Alaska Fairbanks where he used SCUBA to study the nearshore fish and habitat complexity in Kachemak Bay.

Before coming to the UA system, Joel was a research fisheries biologist with the Kachemak Bay Research Reserve in Homer. While there he studied marine ecology and questions pertaining to fish habitat use in the nearshore environment. Joel also coordinated a nationwide water quality and meteorological monitoring project and worked on a hardshell clam recruitment and growth study focused on determining the timing of spawning, recruitment and growth of pacific littleneck clams.

Joel has been with the Fisheries Technology program since 2013 when he was an outreach coordinator and adjunct faculty at the Homer campus. In his free time Joel enjoys backcountry skiing, fishing, sailing, is an avid Scuba diver and dive instructor, and generally likes spending time outside. He is passionate about teaching and Alaskan fisheries.







# All about Fish

- Types of Fish in Alaska (important ones)
- General External Biology
- Internal Organs (and some function)
- Reproduction



# Fishes of Alaska (abridged)

- Salmon (5 spp)
- Herring (1spp)
- Cod and Pollock (9spp including Burbot)
- Halibut (26 spp)
- Sablefish / Black cod (1spp)
- Rockfish (lots spp)
- Greenlings (7spp)
- Crabs (5spp)
- Shrimp (4spp)
- Clams (3spp)
- Scallops (1spp)



## Salmon 5 spp







Pacific Salmon Species



# Herring 3 spp





## Pollock and Cod (9 spp)





## Halibut 26 spp





## Sablefish / Blackcod

# Sablefish

Anoplopoma fimbria



## Rockfish (lots)

9 Rockfishes of Alaska







# Greenlings (7 spp)





## Crabs (5 spp)





# Shrimp (4 spp)





## Catfish ?





Clams (3 spp)







# Scallops



There are \_\_\_\_\_ Rockfish Species in Alaska
One
Fin

· Nine · Lots

#### Alaska Fish

Quiz - 4 questions

Last Modified: Jan 05, 2016 at 08:46 AM

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## Types of Fisheries































## Troll Salmon















## 





## Salmon Gillnet
































# Set Net













# longline



















FIG. 13.-HALIBUT DORY COMING ALONGSIDE FISHING VESSEL, SOUTHEAST





# Crabber



































# Scallop Dredge

















# Other







# Dive Fisheries









Most Fishing Vessels in Alaska are roughly the same, they just fish for different species.

#### **Fisheries & Vessels**

Quiz - 4 questions

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# Fish Biology





## **Fish Biology External**







# Dorsal fins

One

Two

Three

????





Compressed (flattened- side to side)










## Fish Biology Internal





## Gills





## Fish Biology Internal





## Reproduction



The committee to decide whether spawning should be taught in school



## Modes of Reproduction

- **Ovopartity-** Lay undeveloped eggs, External fertilization (90% of bony fish), Internal fertilization (some sharks and rays) **Ovoviviparity-** Internal development- without direct maternal nourishment-Advanced at birth (most sharks + rays)-Larval birth (some scorpeaniforms-rockfish)
- **Viviparity-** Internal development- direct nourishment from mother-Fully advanced at birth (some sharks, surf perches)



# Reproduction 3 Types

### Non-guarders

Open substrate spawners Pelagic spawners Benthic bottom spawners Brood hiders

### Guarders

Substrate spawners Nest Spawners

#### Bearers

Internal External



## Nonguarders

Do not protect eggs or young once spawning is finished

Two groups:

Open substrate spawners

Pelagic spawners – tuna, sardines

Benthic bottom spawners – Cod, herring, pikes

Brood hiders (salmon and trout, for example)



## Brood hiders

- Egg hiders with no care beyond spawning
- Females of salmon and trout dig nests (redds) with their tails
- Once eggs are laid, fertilized and buried, the nest is abandoned

## 

## Redds











## Eggs or liveborn young?

	Oviparity	Viviparity
Literally means	Ovum = egg, parus = bearing	Vivus = living, parus = bearing
Description	Eggs released by mother, embryos develop outside mother's body, nourished by egg yolk	Embryo develops in mother, born as young. Mode of nutrition varies
Benefits	Reduced energy use in care of young Yolk provides good nutrient source	More likely for offspring to survive to birth
Drawbacks	Eggs may need to be incubated Less chance of survival to birth due to eg. Eggs desiccating, predators, poor environment	Energy expenditure for female carrying offspring
Examples	Birds, sharks, reptiles, monotremes	Humans, some snake species, most mammals



## Parental care or not?

	No parental	Care of laid	Care of young
	care	eggs	
What is it?	No contact with offspring after eggs are laid	Guarding and/or incubating eggs to hatching	Care of young after hatching/birth
Benefits	Free to mate more No energy expenditure	Eggs have protection from predators/ harsh conditions	High chance of offspring survival
Drawbacks	High levels of mortality	Energy expenditure Some mortality after hatching	Very high levels of energy expenditure – may not be able to mate for many years after offspring birth
Examples	Reef fish, frogs, turtles	Seahorse, diamond python, cephalopods (eg. Octopus, squid), spiders	Humans, primates. Mammals (milk), emperor penguins, emus





## Fertilization Methods

External - most common

Great fecundity less time, energy, and risk higher potential # of mates no or little selectivity

#### Internal (~ iteroparous sp.)

Lower fecundity more time, energy, and risk courtship, bonding, etc. mate selectivity (quality) some mate guarantee



## Fertilization Methods

**Promiscuous** (most common) multiple partners (both  $\mathcal{Q}\mathcal{A}$ ) **Polygynous** (more common) 3 > 1 partner (or harems) Polyandrous (much less common)  $\bigcirc$  > 1 partner (some 'leks') **Monogamous** (rare) single mating pair, each repo cycle or lifetime parasitic (also be polyandry?)

male(s) attaches to female



## Embryonic Period

Period during which young is entirely dependent on nutrition provided by mother – either from yolk or placenta or compromise between the two



## Larval Period

- Appearance of ability to capture food
- Special larval structures related to respiration and other functions may also develop
- Ends when axial skeleton formed and embryonic median fanfold is gone



#### 

# Juvenile Period

- Period begins when organ systems fully formed
- Fully formed fins present
- Miniature adults in appearance
- Period lasts until gonads fully formed – period of most rapid growth in life of fish









# Adult Period

- Once gonads mature fish is considered an adult
- Onset of this period is indicated by spawning behavior, development of reproductive structures and color patterns







## Senescent Period

- Few fish reach this old age stage when growth is nearly stopped and gonads degenerate
- Period may last from years in sturgeon to days in Pacific salmon







## External Differences - Males and Females

- Size or shape
- Color
- Body structures
- Mating structures
- Behavior



## Sexual Dimorphism / Dichromatism





# Sex Change in Fish

- Occurs mainly when one sex has higher survival and reproductive rates
- In some fish sex change is reversible
- Some sex change is environmentally determined
- Pollution research is indicating pollutants can cause sex changes in fish by disrupting endocrine cycles





In fish, what organs are responsible for extracting oxygen from water - twin bladow - data - data - toinya - double

#### **Fish Biology**

Quiz - 3 questions

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## Federal Management Areas





## Federal Management Areas





## State Management Areas





## State Management Areas





## Federal Groundfish Mgmt





## Timing Fisheries Take Place

#### Cook Inlet

SALMON	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Upper Cook Inlet Chinook								Gillnet				
coho								Gillnet				
pink/chum							Gi	Inet				
sockeye							Gillne					
Lower Cook Inlet							Cillag	#Coinc				
sockeve						Gillao	f/Soino	voeine				
chum						Giine	Gillr	et/Seir	e			
HERRING	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Upper Cook Inlet												
sac roe and food/bait				Gi	Inet							
SHELLFISH	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
razor clam						Sł	ovel					
hardshell clam							R	ake				
scallop									Dred	e		
GROUNDFISH Pacific cod	JAN Par	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
rockfish/lingcod	Buca	tch on	u (man	1 full ro	tontion	all upar)			lia (dir	octod)		
sablefish	Le y Ce	ton on	y (n iel i		Condon	an year)		Pot/ o	naline	coacu)		

#### Prince William Sound/Copper River

SALMON	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Chinook					(	Gillnet						
coho									Gillnet			
pink							Gillne	et/Seine	e			
sockeye							Gillnet					
chum							Gillnet					
SHELLFISH	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
shrimp						Trawl					Traw	
acollon			_									
scallop	Dre	edge							Dre	dge		
GROUNDFISH	Dre JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	dge OCT	NOV	DEC
GROUNDFISH Pacific cod	Dre JAN Par	edge FEB rallel	MAR State	APR e wate	MAY	JUNE	JULY ot/Jig; I	AUG _onglin	Ure SEPT e closes	dge OCT s by EC	NOV D on M	DEC ay 1)
GROUNDFISH Pacific cod rockfish	Dre JAN Par	edge FEB rallel	MAR Stat	APR e wate Bycato	MAY rs (Lon h fishe	JUNE gline/Port	JULY ot/Jig; l (full ret	AUG onglin	Dre SEPT e closes required	dge   OCT s by E( d)	NOV D on M	DEC ay 1)
GROUNDFISH Pacific cod rockfish pollock	Dre JAN Par	edge FEB rallel Tra	MAR Stati	APR e wate Bycato	MAY rs (Lon h fishe	JUNE gline/Po ry only	JULY ot/Jig; l (full ret	AUG onglin	Dre SEPT e closes required	dge   OCT s by E0 d)	NOV D on M	DEC ay 1)
GROUNDFISH Pacific cod rockfish pollock sablefish	Dre JAN Par	edge FEB rallel Tra	MAR Stati	APR e wate Bycatc	MAY rs (Lon h fishe Lo	JUNE gline/Po ry only ngline/	JULY ot/Jig; L (full ret Pot/Tra	AUG onglin ention	Dre SEPT e closes required	dge   OCT s by E0 d)	NOV D on M	DEC ay 1)

#### Yakutat

SALMON	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
coho								Set	Gillnet			
sockeye						S	et Gilln	et				
SHELLFISH	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
red/blue king crab											P	ot
shrimp	Po	t						P	ot			
shrimp	Trav	vl							Otter 1	rawl		
scallon	Dred		1						Deer			

Tanner and Dungeness crab fisheries are closed until further notice.

#### Southeast Alaska

SALMON JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC

Chinook		Winter	Troll		Spring	Troll	Sur	nmer T	roll		Winter	Troll
coho							Seine/	Gillnet	Troll			
pink							Sein	e				
sockeye							Seine	/Gillne				
chum							5	Seine/G	Sillnet			
HERRING	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
food/bait	Se	eine									Seine	•
sac roe			Se	ine/Gil	net							
roe on kelp			F	Pound								
SHELLFISH	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
red/blue king crab	Pot				i			i				Pot
golden king crab				Pot								
Dungeness	F	ot	(D1,	D2, 13	B)		Pot (n	nost ar	eas)	Po	t (all)	Pot
Tanner			Pot									
shrimp	Be	am Tr	awl					Bea	m Traw			
shrimp	F	Pot				Po	t				Pot	
geoducks				-			Dive	_	-			
red urchins							Dive					
sea cucumber		Dive									Dive	
GROUNDFISH	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
rockfish	Lo	ongline									L	ongline
sablefish						Long	ine (NS	SE)	Long	ine or	Pot	
lingcod							D	ingleba	ar Gear			
cod						Lo	ongline					

#### Commercial Fishing Seasons in Alaska



Alaska Department of Fish and Game Division of Commercial Fisheries P.O. Box 115526 Juneau, AK 99811-5526 (907) 465-4210 www.cf.adfg.state.ak.us

This summary is intended as a general guide only and is non-binding. For detailed regulatory information refer to official codes.

Season lengths indicated in this summary are subject to closure by emergency order as guideline harvest objectives are met or as deemed necessary by conservation concerns.





## **Timing Fisheries Take Place**

#### Arctic-Yukon-Kuskokwim

SALMON	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Kuskokwim River					I	l						
cono								Gillnet				
chum						G	illnet					
Yukon River												
Chinook						G	linet or	Fishwh	eel			
summer chum							Gillne	t or Fish	wheel			
fall chum								Gil	net or	Fishwh	eel	
Norton Sound		I		I	I	I						I
Chinook						Gill	net					
coho								Gillnet				
pink						(	Sillnet					
chum						Gill	net					
Kotzebue Sound		i	i i	i	i	1			i i	ĺ	i	i
chum							Gil	net				
HERRING	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
sac roe					Gillnet	or Seine						
roe on kelp												
SHELLFISH	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Norton Sound					i	I					I	
red king crab			Pot					Pot				Pot

#### Alaska Peninsula

SALMON	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
South Peninsula												
coho								Gi	Inet/Sei	ine		
pink							Se	ine				
sockeye						Gi	Inet/Se	eine				
chum							Gillnet	/Seine	i i			
North Peninsula	İ	İ	İ	İ	İ	İ				i	İ	İ
coho								Gilln	et/Seine			
sockeye						Gi	llnet/Se	eine .				
HERRING	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
North/South Peninsula												I
sac roe						Seine						
Dutch Harbor	1	ĺ	ĺ	ĺ			1		1	ĺ	1	ĺ –
food/bait								Gillne	t/Seine			
SHELLFISH	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Dungeness	i.			i				F	ot			
Tanner		Pot										
shrimp						F	Pot					
shrimp	Т	rawl						-	Trawl			
scallops	Dr	edae							Dre	dae		
GROUNDFISH	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	I OCT	NOV	DEC
cod						Pr	t/ lia					
rockfish							Det					

#### Bristol Bay/Bering Sea/Aleutian Islands

SALMON	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Chinook						Gillnet						
coho							(	Gillnet				
sockeye	1			1	1		Gillnet		T			
chum	i		i	i	i	Gi	Inet	_	i		i	i –
HERRING	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
sac roe	1			6	- Sillnet/S	Seine	Bait	i	Ì		Ì	
roe on kelp	1		1		land	1	· · ·	i	Ì		i	İ
SHELLFISH	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
red/king crab	Pot			1	1						Pot	
bairdi Tanner		Pot						1	1		Pot	
opilio Tanner			Pot								Pot	
blue king crab						i		i	i	_		
brown king crab			Pot			i				Pot		
GROUNDFISH	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC



#### Chignik

SALMON	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Chinook						F	urse S	eine				
coho								Purse	Seine			
pink								Purse	Seine			
sockeye		İ.			İ.		Purse	Seine				İ.
chum								Purse	Seine			
HERRING	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
sac roe				Pu	irse Se	ine						
GROUNDFISH	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
cod						Pot an	ıd Jig					
rockfish						Ji	3					

#### Kodiak

Southeast Alaska

SALMON	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
coho						i i		Seine/	Gillnet		1	
pink							Se	ine/Gill	net			
sockeye							Seine	:/Gillnet				
chum							Sein	e/Gillne	t			
HERRING	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
food/bait	Trawl	Seine	Gillne	t						Traw	/Seine	/Gillnet
sac roe					Seine/	Gillnet						
SHELLFISH	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Dungeness								P	ot			
Tanner		Po	t									
shrimp	Tra	awl							Trav	d		
shrimp						F	ot					
scallops	Dred	ge							Dre	dge		
scallops sea urchins	Dred Dive	ge							Dre	dge	Dive	
scallops sea urchins sea cucumber	Dred Dive	ge Di	ive						Dre	dge	Dive Dive	
scallops sea urchins sea cucumber GROUNDFISH	Dred Dive JAN	ge Di FEB	ive MAR	APR	MAY	JUNE	JULY	AUG	Dre	dge OCT	Dive Dive	DEC
scallops sea urchins sea cucumber GROUNDFISH cod	Dred Dive JAN	ge Di FEB	we MAR Pot	APR	MAY	JUNE	JULY	AUG	Dre	dge OCT	Dive Dive NOV	DEC
scallops sea urchins sea cucumber GROUNDFISH cod cod	Dred Dive JAN	ge Di FEB	we MAR Pot	APR	MAY	JUNE	JULY t/Jig	AUG	Dre	dge OCT	Dive Dive NOV	DEC
scallops sea urchins sea cucumber GROUNDFISH cod cod rockfish	Dred Dive JAN	ge Di FEB	MAR Pot	APR	MAY	JUNE	JULY t/Jig Jig	AUG	Dre SEPT	dge OCT	Dive Dive NOV	DEC
scallops sea urchins sea cucumber GROUNDFISH cod cod rockfish	Dred Dive JAN	ge Di FEB	ive   MAR Pot	APR	MAY	JUNE	JULY t/Jig Jig	AUG	Dre	OCT	Dive Dive NOV	DEC



## SE Detail

#### Southeast Alaska

SALMON	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Chinook	١	Winter	Troll		Spring	Troll	Sun	nmer T	roll		Winter	Troll
coho							Seine/	Gillnet/	Troll			
pink							Sein	е				
sockeye							Seine	/Gillnet				
chum							S	Seine/G	Gillnet			
HERRING	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
food/bait	Se	eine									Seine	
sac roe			Se	ine/Gil	net							
roe on kelp			F	ound								
SHELLFISH	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
red/blue king crab	Pot										F	Pot
golden king crab				Pot								
Dungeness	P	ot	(D1,	D2, 13	B)		Pot (n	n <mark>ost</mark> ar	eas)	Pot	(all)	Pot
Tanner			Pot									
shrimp	Be	am Tr	awl					Bear	m Trawl			
shrimp	P	ot				Po	t				Pot	
geoducks							Dive					
red urchins							Dive					
sea cucumber		Dive									Dive	
GROUNDFISH	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
rockfish	Lo	ongline									L	ongline
sablefish						Longl	ine (NS	E)	Long	ine or F	Pot	
lingcod							D	ingleba	ar Gear			
cod						Lo	ongline					



### Cook Inlet Detail Cook Inlet

SALMON	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	ОСТ	NOV	DEC
Upper Cook Inlet												
Chinook							(	Gillnet				
coho								Gillnet				
pink/chum							Gil	Inet				
sockeye							Gillne	t				
Lower Cook Inlet												
pink							Gillne	t/Seine				
sockeye						Gillne	t/Seine					
chum							Gillr	net/Seir	ne			
HERRING	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Upper Cook Inlet												
sac roe and food/bait				Gi	llnet							
SHELLFISH	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
razor clam	Shovel											
hardshell clam	Rake											
scallop									Dredg	ge		
GROUNDFISH	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Pacific cod	Parallel State waters (Pot/Jig)											
rockfish/lingcod	Byca	tch on	y (man	d. full re	tention	all year)			Jia (dir	ected)		
sablefish								Pot/Lo	ngline			
Location & Timing



# AK Penn Detail Alaska Peninsula

SALMON	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	ОСТ	NOV	DEC
South Peninsula												
coho								Gil	Inet/ Sei	ne		
pink							Se	eine				
sockeye						Gil	Inet/Se	eine				
chum							Gillnet	/Seine				
North Peninsula	İ	ĺ		İ	ĺ	l		0.11		ĺ	ĺ	
								Gilln	et/Seine			
sockeye						Gil	Inet/Se	eine				
HERRING	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
North/South Peninsula												
sac roe						Seine						
Dutch Harbor												
food/bait								Gillne	t/Seine			
SHELLFISH	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
Dungeness								F	ot			
Tanner		Pot										
shrimp						F	Pot					
shrimp	Т	rawl							Trawl			
scallops	Dr	edge							Dree	dge		
GROUNDFISH	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
cod						Po	t/Jig					
rockfish						F	Pot					

Economics



# Economic Input of Fisheries

#### Alaska Seafood Industry: Direct U.S. Employment, Earnings, and Production, 2011

	Number of Workers	Avg. Monthly Employment	Labor Income (\$Millions)	Economic Output (\$Millions)
Commercial Fishing	32,000	16,500	\$1,078	\$2,160
Seafood Processing	32,000	16,300	\$695	\$2,450
Mgmt/Hatcheries/Tenders	4,900	3,400	\$289	\$653
Wholesale/Distributors	1,000	1,000	\$79	\$180
Grocers	6,200	6,200	\$176	\$347
Restaurants	17,900	17,900	\$464	\$1,310
Total Direct Impacts	94,000	61,200	\$2,782	\$6,447

Notes: These data represent direct impacts of the industry; they do not include multiplier effects.

### Economics



Real Wholesale Value by Species, 2003-2009



Source: Hiatt, 2007 and Hiatt, 2010b

## Economics



Table 1. Seafood Industry Employment by Region, 2009				
Summary of Workers	Harvesting	Processing	Total	
Aleutian and Pribilof Islands	5,309	6,276	11,585	
Bristol Bay	9,385	4,522	13,907	
Kodiak	3,664	2,934	6,598	
Northern	627	68	695	
Southcentral	8,071	3,491	11,562	
Southeast	10,150	4,886	15,036	
Yukon Delta	2,986	831	3,817	
At-Sea	1,732	5,616	7,348	
Total	41,924	28,624	70,548	
Source: Northern Economics Inc. and	ADOLWD 2010	COLUMN TOTAL & MARCHINE		



#### Table 2. Estimated Seafood Ex-vessel Volume and Value by Region, 2009

Region	Harvest Weight (1,000 MT)	Ex-Vessel Value (\$ Millions)		
Aleutian and Pribilof Islands	497.2	393.7		
Bristol Bay	86.6	119.0		
Kodiak	157.2	129.8		
Northwest/Arctic/Yukon-Kuskokwim	3.9	6.7		
Southcentral	77.8	177.0		
Southeast	134.4	209.8		
At-Sea	883.0	307.9		
Total	1,840.0	1,343.8		
Source: Estimated by Northern Economics using NMFS (2010a), Hiatt (2010a) and Hiatt (2010b).				



#### **Location & Economics**

Quiz - 4 questions

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