

# ALPHAVIRUS , PRV AND PMCV SITUATION IN CHILE



**SERNAPESCA**

Ministerio de  
Economía, Fomento  
y Turismo

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Trination meeting  
Trondheim, February 2014

# Geographic Distribution of salmon production

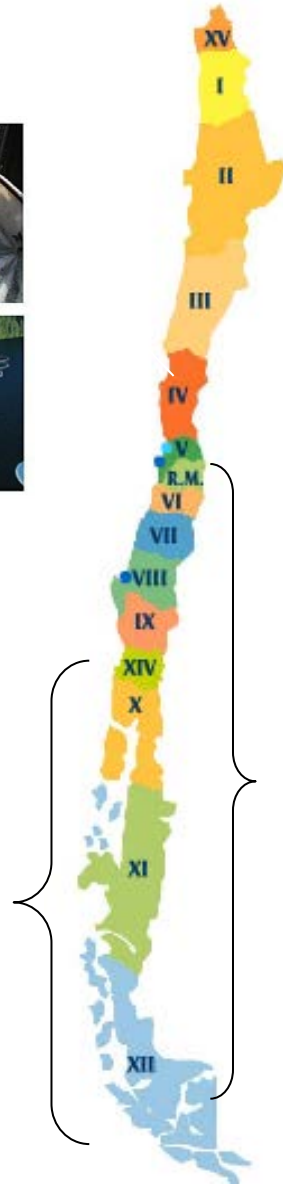


cultivated species

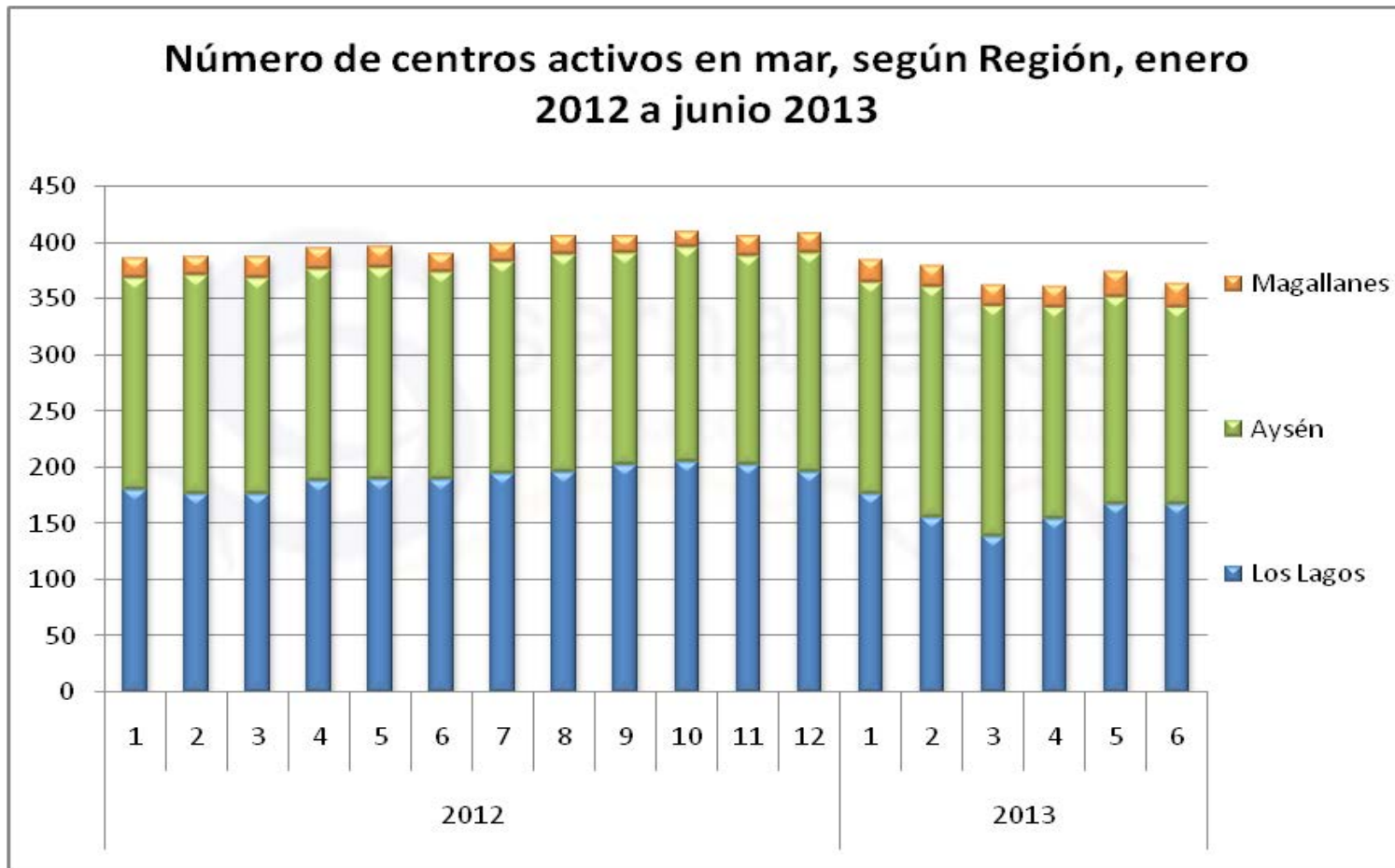
- ***Salmo salar***
- *O. mykiss*
- *O. kisutch*
- *O. tshawytscha*

Fresh Water

Sea Water

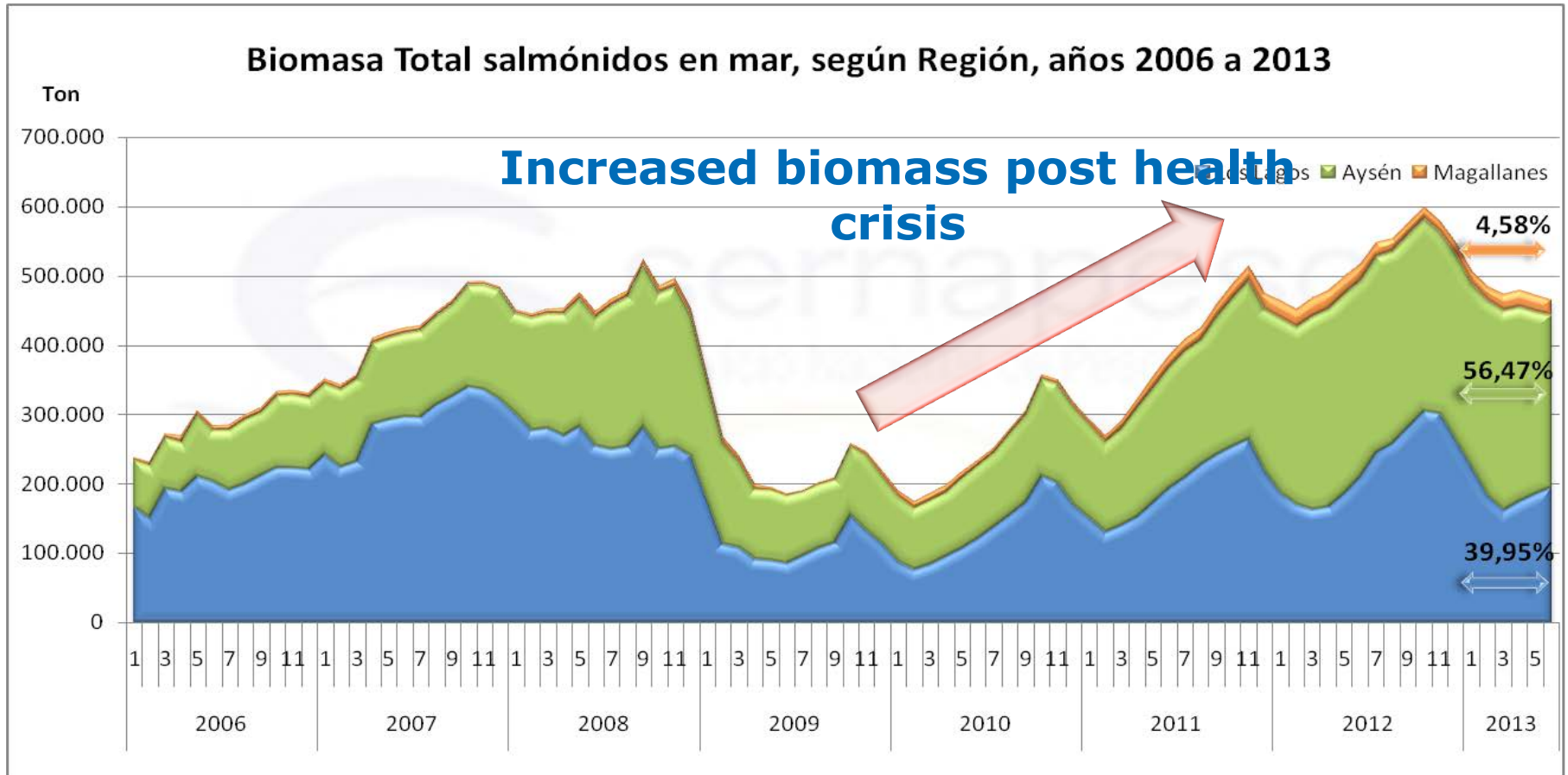


## PRODUCTIVE CONTEXT: NUMBER OF SEA FARMS



- Average number of sea farms in activity: **370 sea farms** located in Los Lagos (43.1%), **Aysén (51.3%)** and Magallanes Regions (5.7%).
- The numbers are similar to 2012.

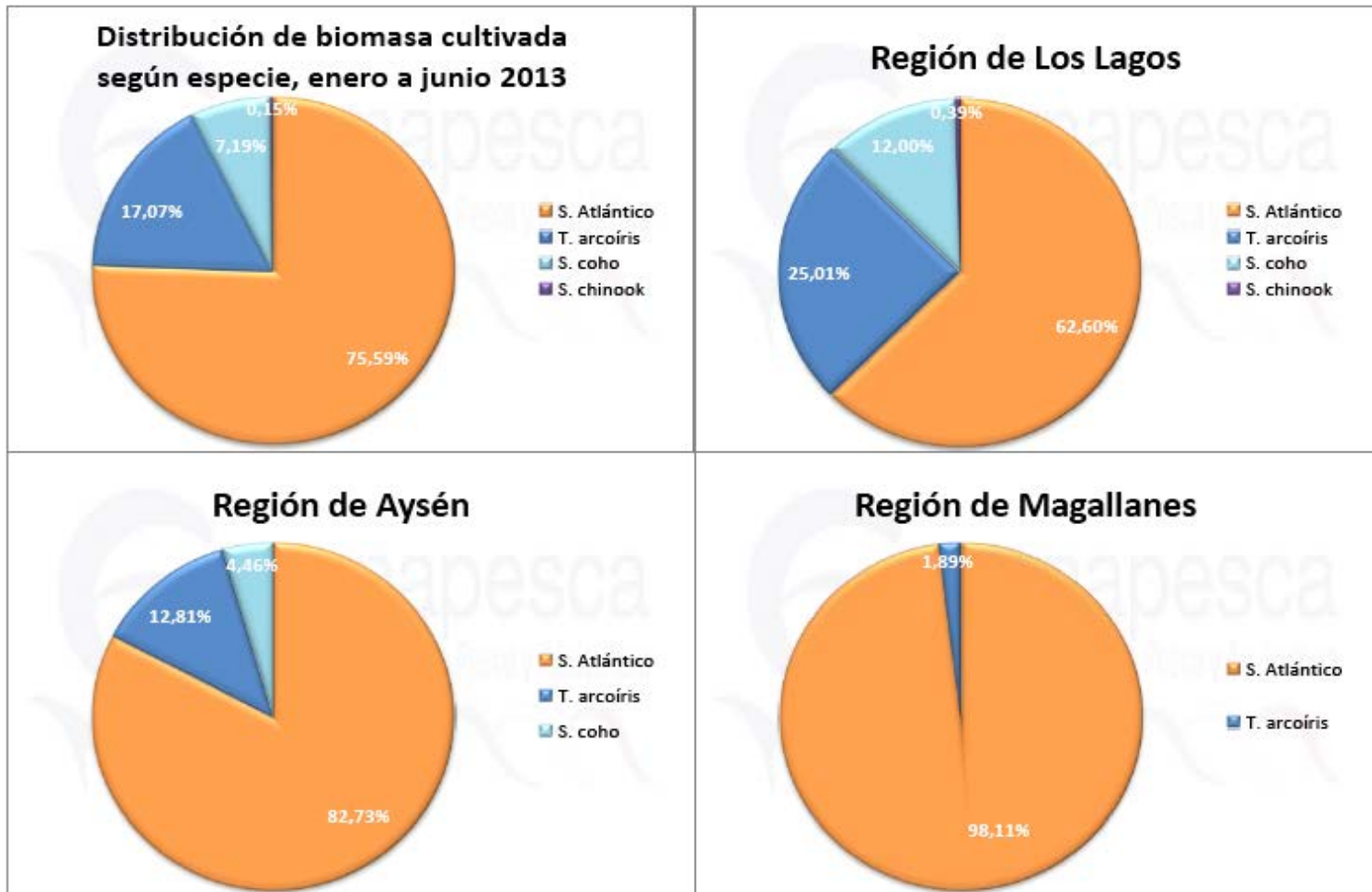
## PRODUCTIVE CONTEXT: BIOMASS



- Cultivated biomass (tons): similar to 2012, where the historical maximum occurred in october **(600,000 tons)**
- **Aysén Region** concentrates **56.5%** of the entire biomass.



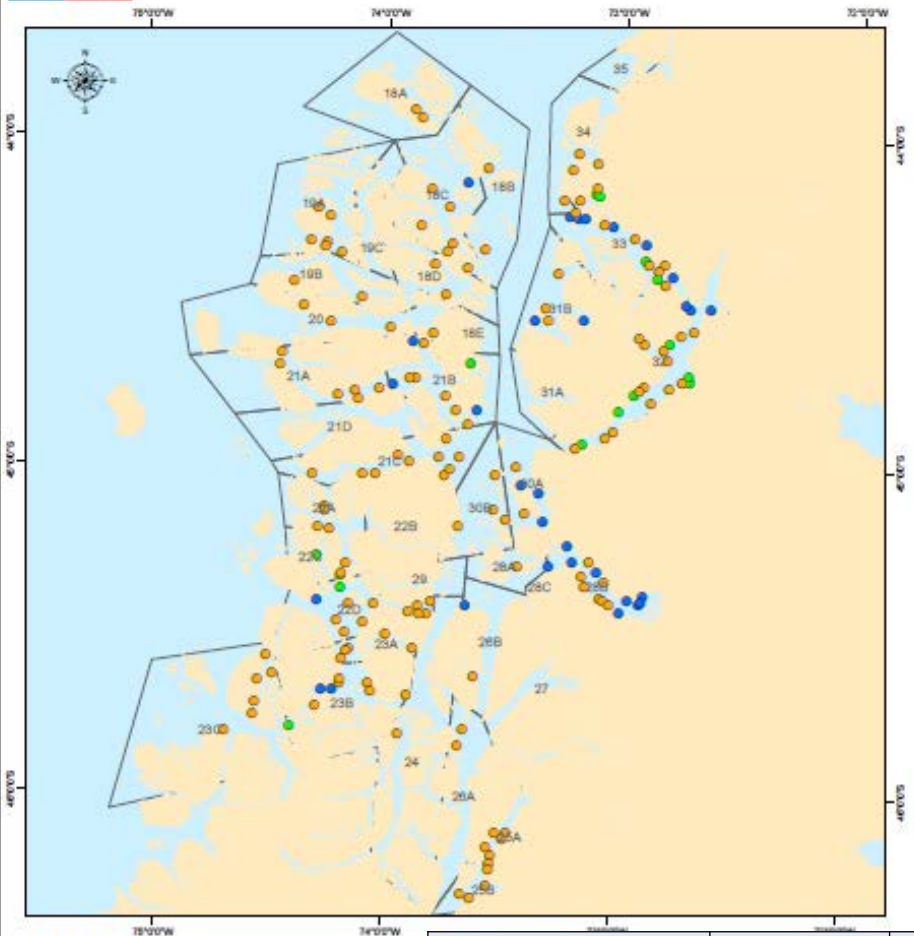
## PRODUCTIVE CONTEXT: BIOMASS/SPECIES



- **Atlantic salmon** represents **75.6%** of the cultivated biomass, followed by rainbow trout (17.1%) and coho salmon (7.2%)



### Salmonid Farming Sites Aysén Region Week N° 4 - Year 2014

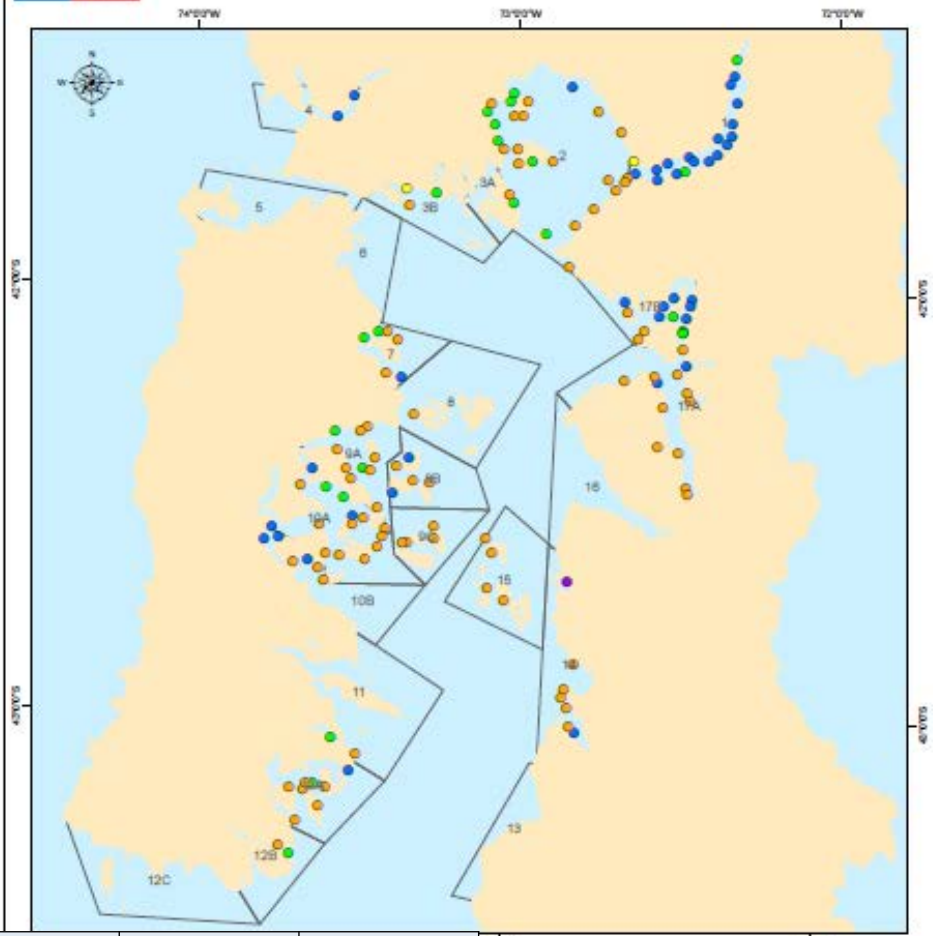


#### Legend

- Atlantic salmon
- Rainbow trout
- Coho salmon
- Atlantic salmon + Rain
- Rainbow trout + Coho



### Salmonid Farming Sites Los Lagos Region Week N° 4 - Year 2014



Region	Atlantic salmon	Rainbow trout	Coho salmon	Total
Los Lagos (X)	82	39	24	145
Aysén (XI)	137	31	15	183
Magallanes (XII)	21	4		25
<b>Total</b>	<b>240</b>	<b>74</b>	<b>39</b>	<b>353</b>

0 4 8 16 24 32  
km  
Fuente cartográfica  
IGN 2002  
Datum WGS-84 1983  
Elaboración propia  
SERNAPESCA



# List of Diseases

## List EAR 1

- Epizootic haematopoietic necrosis
- Infectious haematopoietic necrosis virus
- Infection with *Aphanomyces invadans* (Epizootic ulcerative syndrome)
- Infection with *Gyrodactylus salaris*
- Koi herpesvirus disease
- Viral haemorrhagic septicaemia virus
- Spring viraemia of carp virus
- Red sea bream iridovirus
- **Alphavirus Infectious (2008/2013)**
- **Totivirus Infectious (2013)**

**Free**

## List EAR 2


- Infectious pancreatic necrosis
- **Piscirickettsiosis**
- Renibacteriosis (BKD)
- **Infectious salmon anaemia virus (ISAV) (HPR 0 and HPR delete)**
- **Sea lice**
- **List EAR 3**  
**PRV** (purpose of collecting information)

**Control Program**

**In Chile we have 3 lists of diseases**

# Active Surveillance Program



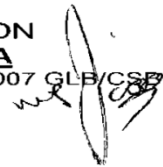
- Active surveillance system implemented in Chile - 2003, (Specific for High Risk Diseases (HRD))
  - Two annual visits to confirm the absence of HRD, These visits are performed by veterinarians (Certifier health condition).
  - Since the Program's inspection, analyses has been made based on cell culture, using CHSE-214 and EPC or BF-2 cell lines. From 2009 was incorporated RT-PCR to Alphavirus and, finally, in the second semestre of 2013 was incorporated RT-PCR to Totivirus.
  - The organs sampled for cell culture are: kidney, spleen, brain and heart. To perform the RT-PCR for SPDV and PMCV, heart samples are used. The samples are combined and consist in pools of no more than 5 fish.
- 



# SAV / PD

- May 2008: inclusión of PD as high risk list disease as a mandatory declaration disease.

MINISTERIO DE ECONOMIA,  
FOMENTO Y RECONSTRUCCION  
**SUBSECRETARIA DE PESCA**  
Modifica enfermedades de Alto riesgo 2007 GLB/CSP



MODIFICA RESOLUCIÓN QUE  
ESTABLECE CLASIFICACIÓN DE  
ENFERMEDADES DE ALTO RIESGO.

VALPARAISO, 30 MAY 2008

-N° **1393**

1.- Modificase la Resolución N° 2572 de 2007, de esta Subsecretaría, que estableció la clasificación anual de enfermedades de alto riesgo, en conformidad a lo prescrito en el artículo 3° del D.S. N° 319 de 2001, del Ministerio de Economía, Fomento y Reconstrucción, que estableció el Reglamento de Medidas de Protección, Control y Erradicación de Enfermedades de Alto Riesgo para las Especies Hidrobiológicas, en el sentido de incorporar en la Lista 1 de Peces la siguiente enfermedad y su respectivo agente causal:

Enfermedad	Agente Causal
Enfermedad del Páncreas	<i>Virus de la enfermedad del páncreas, de la familia Togaviridae</i>

# Alphavirus

- 2009 included in the Official Active Surveillance Program for High Risk Disease
  - 2 annual samplings in every site stocked with susceptible species.
  - Official testing: Real time RT-PCR Hodneland & Endresen (2006)
- All samplings have been negative

# PRV/HSMI Study - 2012

Sernapesca/Subpesca runs a study to confirm or rule out the presence of PRV/HSMI.

## Methods:

- Sampling of 28 sea sites located in X, XI and XII region.
- Sites selection criteria: species (*Salmo salar*) and average weight (>1 kg).
- Sampling: 15 fishes per site (n=365 samples).
- Analysis: RT-PCR (heart and Kidney), methods: Palacios, 2010 (HSMI). Histology: muscle, heart, piloric caeca, gill, liver, spleen and kidney.
- Studies, to conclude that PRV is present in the species *Salmo salar* in sea farming centers in X, XI and XII.
- Histopathology: non-specific findings

# PMCV

## Surveillance of PMCV (Totivirus) (Listed July 2013):

- Official surveillance program from August 2013.
- Must be included in the second annual sampling.
- Farms already made , should make special sampling for PMCV.
- Diagnostic method: Real time RT-PCR Løvoll et al. 2010 (Virology Journal, 7:309) and Haugland et al. 2011 (Journal of virology, June 2011, p. 5275-5286).
- All samplings have been negative (15.065 fishes)

Year	Type of site	N° of Sampled Fish	Techniques
2007	Sea	41.852	Cellular cultura in CHSE-214 + EPC o BF2
	Freshwater	38.113	Cellular cultura in CHSE-214 + EPC o BF2
2008	Sea	31.312	Cellular cultura in CHSE-214 + EPC o BF2
	Freshwater	28.541	Cellular cultura in CHSE-214 + EPC o BF2
2009	Sea	18.311	Cellular cultura in CHSE-214 + EPC o BF2 + real time RT-PCR (Alphavirus)
	Freshwater	14.880	Cellular cultura in CHSE-214 + EPC o BF2 + real time RT-PCR
2010	Sea	17.311	Cellular cultura in CHSE-214 + EPC o BF2 + real time RT-PCR
	Freshwater	15.458	Cellular cultura in CHSE-214 + EPC o BF2 + real time RT-PCR
2011	Sea	14.656	Cellular cultura in CHSE-214 + EPC o BF2 + real time RT-PCR
	Freshwater	17.525	Cellular cultura in CHSE-214 + EPC o BF2 + real time RT-PCR
2012	Sea	18.820	Cellular cultura in CHSE-214 + EPC o BF2 + real time RT-PCR
	Freshwater	15.490	Cellular cultura in CHSE-214 + EPC o BF2 + real time RT-PCR
2013*	Sea	20.674	Cellular cultura in CHSE-214 + EPC o BF2 + real time RT-PCR
	Freshwater	15.590	Cellular cultura in CHSE-214 + EPC o BF2 + real time RT-PCR (Alphavirus and Totivirus)
<b>Total general</b>		<b>685.866</b>	
* Only considers the information of the first days of December 2013			

- all sample negative

# Official diagnosis system of high-risk disease in Chile

## Legal framework



### Obligations of laboratories (Private laboratories):

- Standardized work procedures.
- ISO 17025 accreditation
- Deliver periodic results of PVA, PVP, PSGR and Specific Surveillance and Control Programs (ISA and Piscirickettsiosis).
- Immediate reporting of suspected or positive results EAR List 1 and List 2 PSEVC-ISA and PSEVC-Piscirickettsiosis



# Official diagnosis system of high-risk disease in Chile

## Legal framework



### Reference Laboratories: (Resolution No. 1448 of 6/07/2011).

- Laboratorio del NBC
- Universidad Católica de Valparaíso.**
- ISA
- PS (molecular)

- Laboratorio de Virología
- Universidad de Valparaíso**
- IPN

- Laboratorio de biotecnología y patología acuática
- Universidad Austral de Chile.**
- Exóticas (PD, PMVC, VHS)
- PRV
- BKD

- Laboratorio de anatomía patológica
- Universidad de Chile.**
- PS (histopatología)





## Next Steps

- Continuing with the investigation PRV in fresh water (February 2014).
- Implement new diagnostic techniques: Immunohistochemistry (PRV/HSMI)
- Training in cardiac pathologies
- Biosecurity Conference 2014 (Aquasur, October)
  - PD / CMS / HSMI





# Gracias



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Ministerio de  
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Gobierno de Chile