

VOLUNTARY INITIATIVES IN THE SALMON INDUSTRY IN CHILE: ROLE AND PROSPECTS

ADOLFO ALVIAL

GENERAL MANAGER

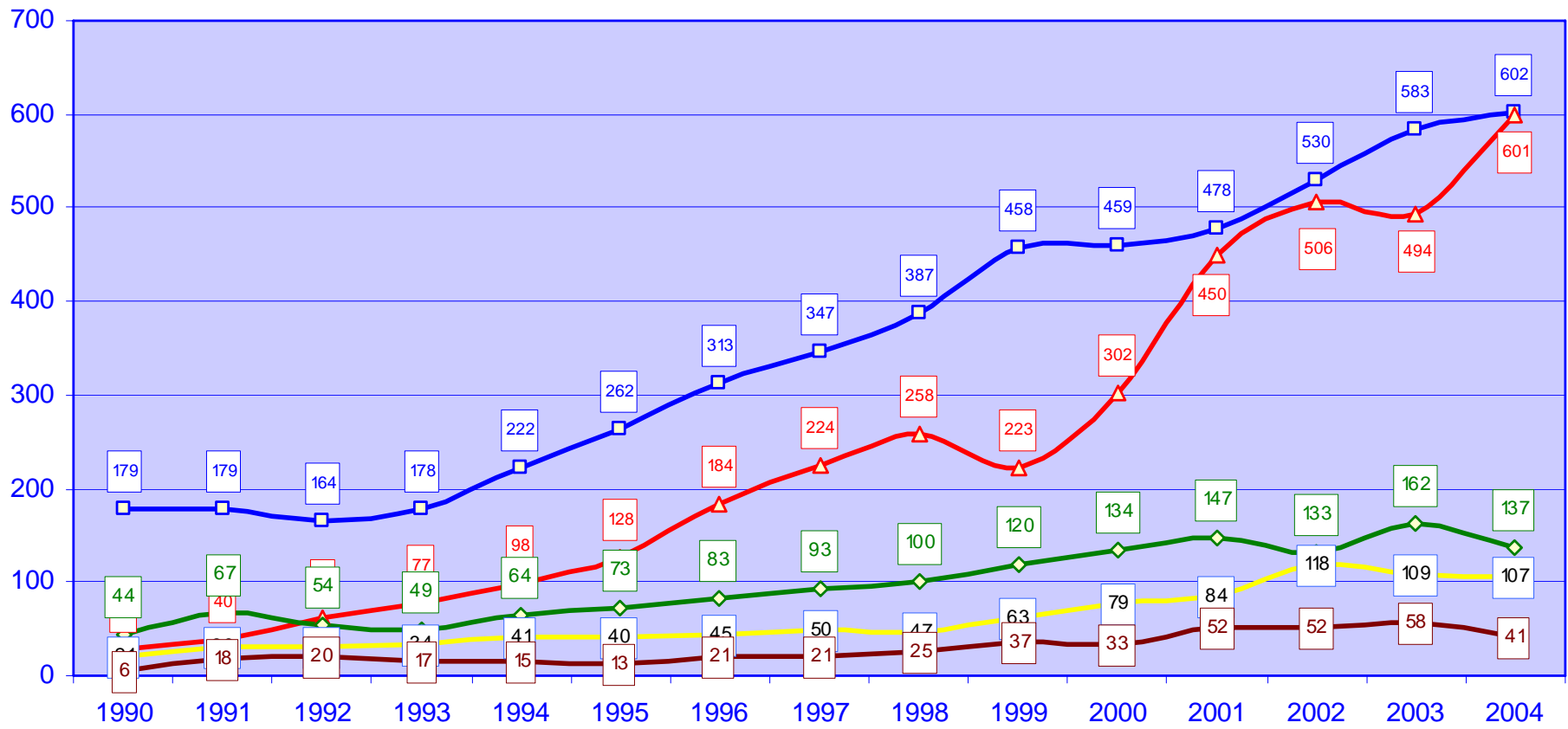
*TECHNOLOGICAL INSTITUTE OF SALMON
CHILE*



AN EXPORT ORIENTED INDUSTRY



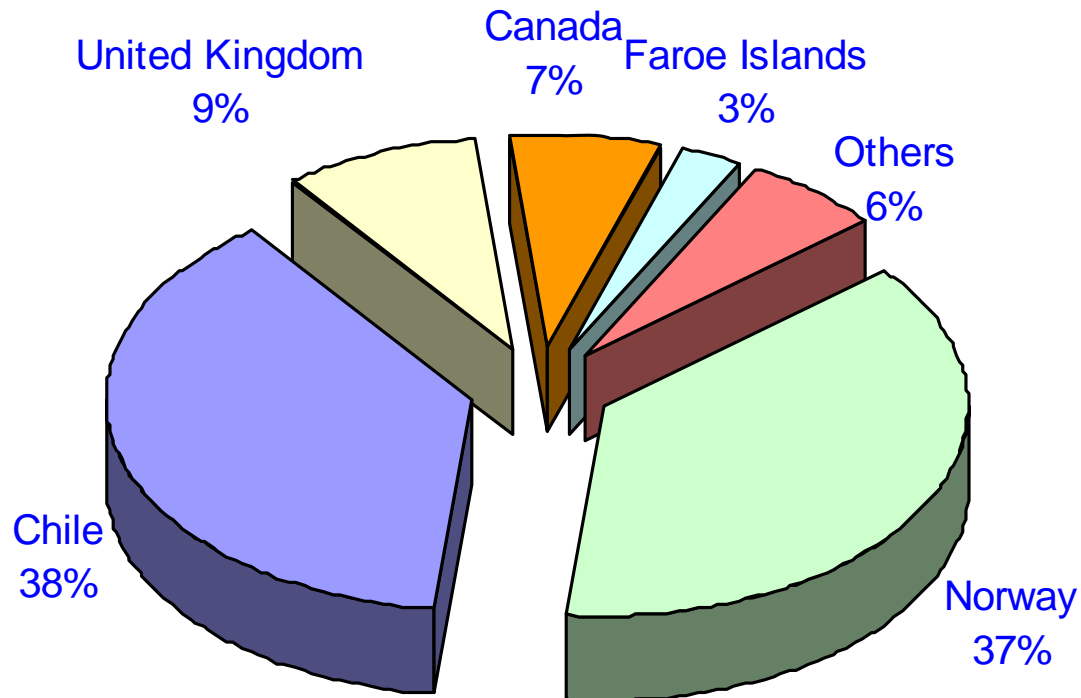
WORLD PRODUCTION OF FARMED SALMON AND TROUT



—□— Noruega —△— Chile —◇— Reino Unido —△— Canadá —×— Islas Faroe

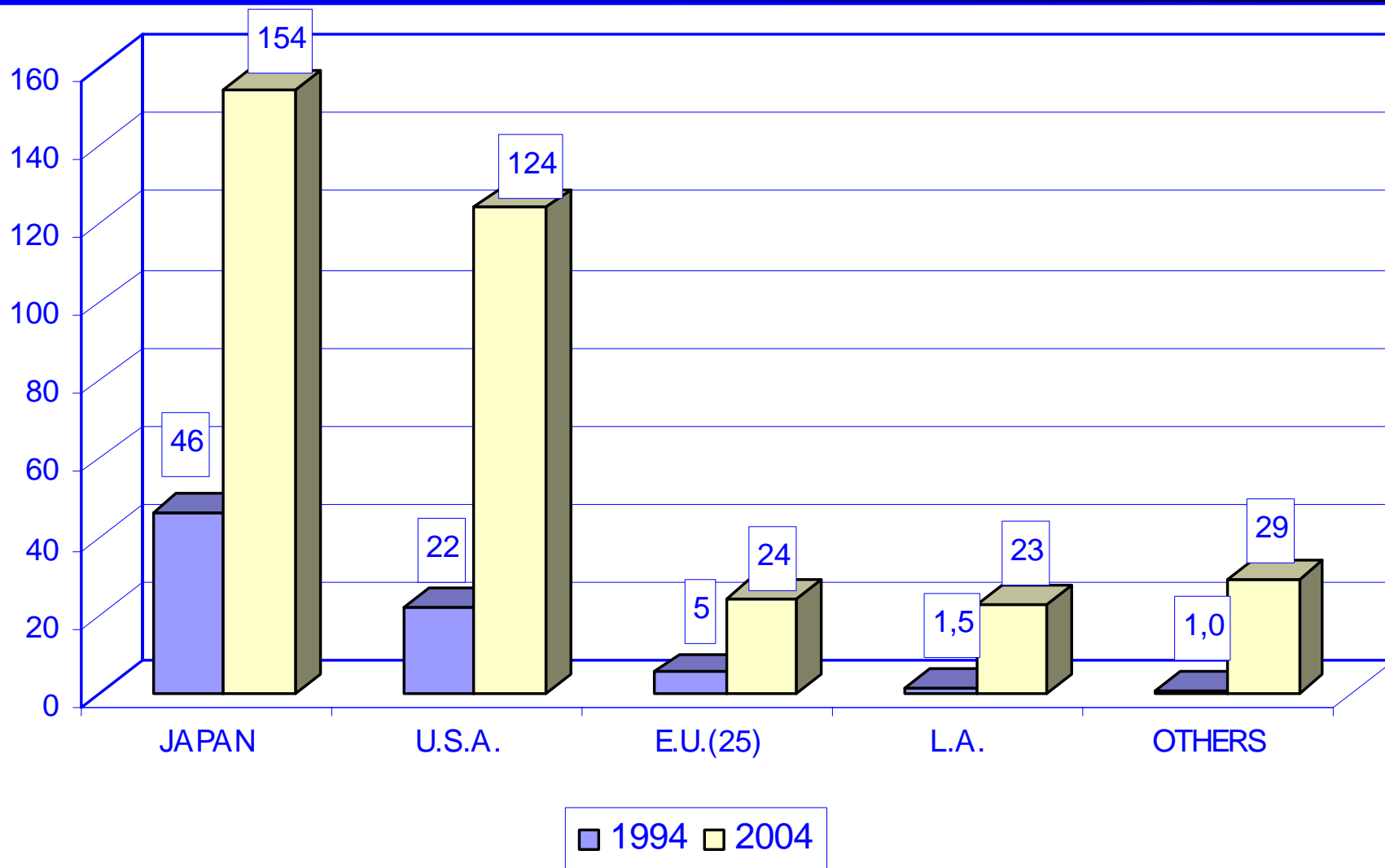
PRODUCTION BY COUNTRY 2004

1.597.000 tons round weight



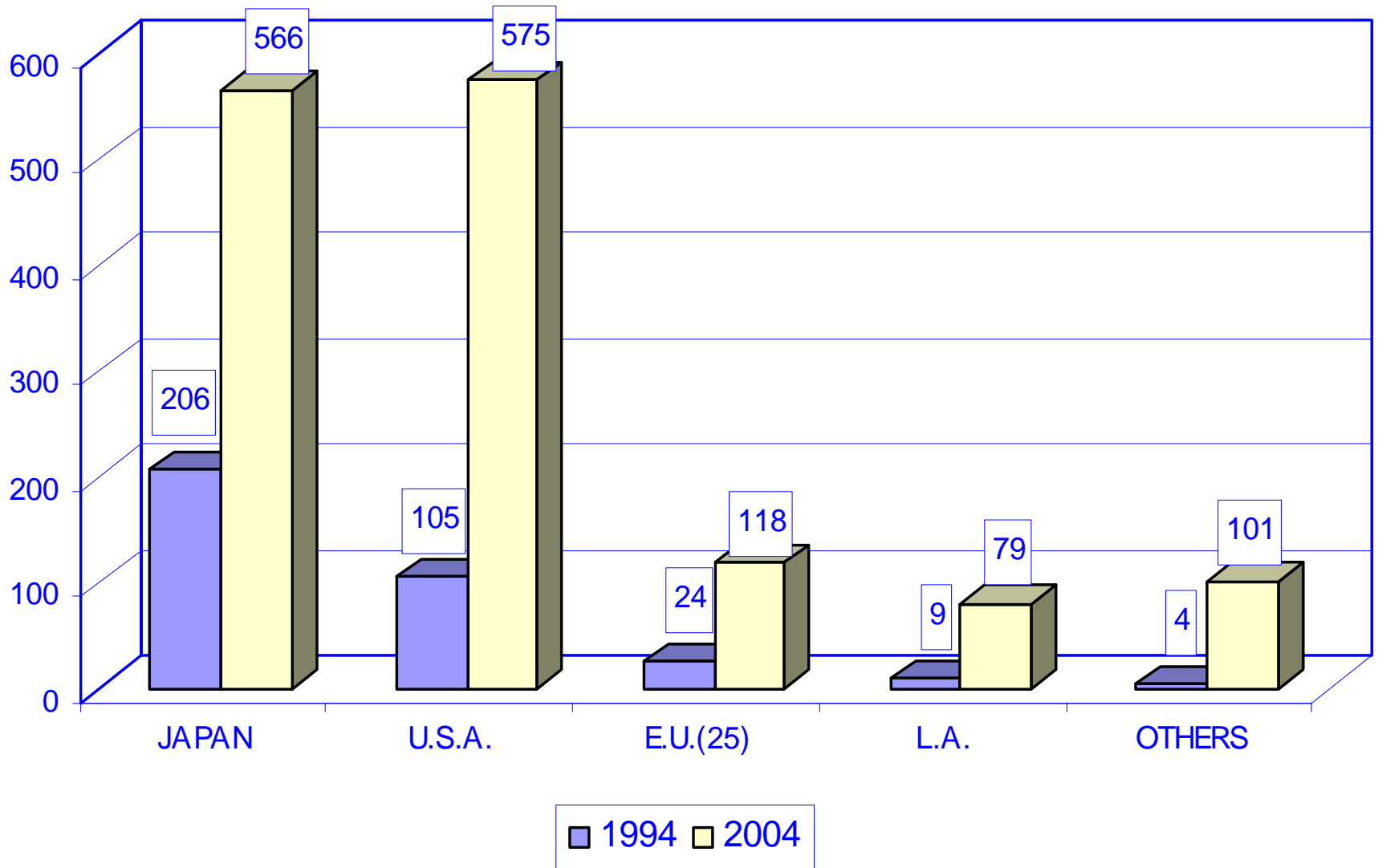
TOTAL CHILEAN EXPORTS TO PRINCIPAL MARKETS.

Thousand net tons.



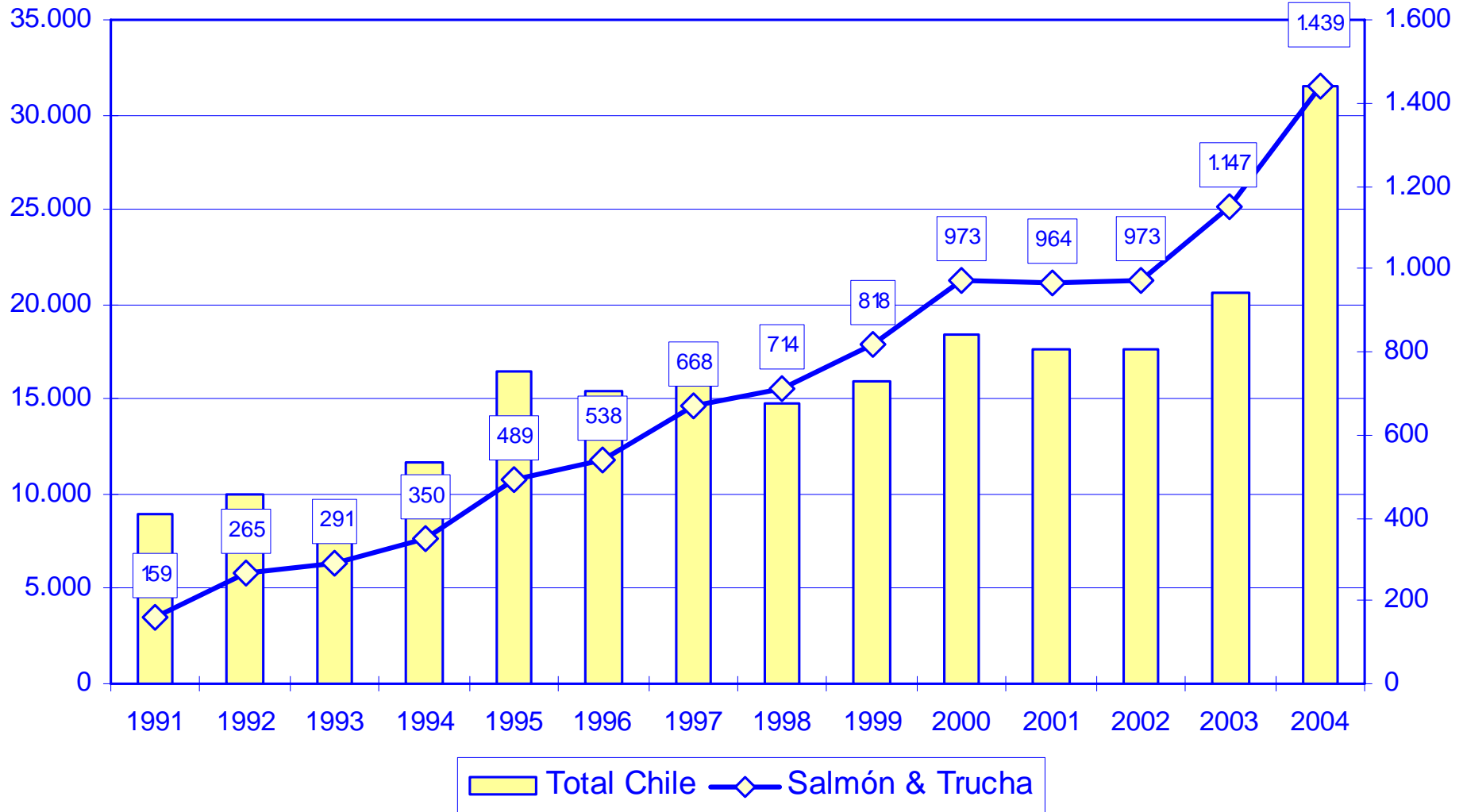
TOTAL CHILEAN EXPORTS IN VALUE TO PRINCIPAL MARKETS.

Million dollars



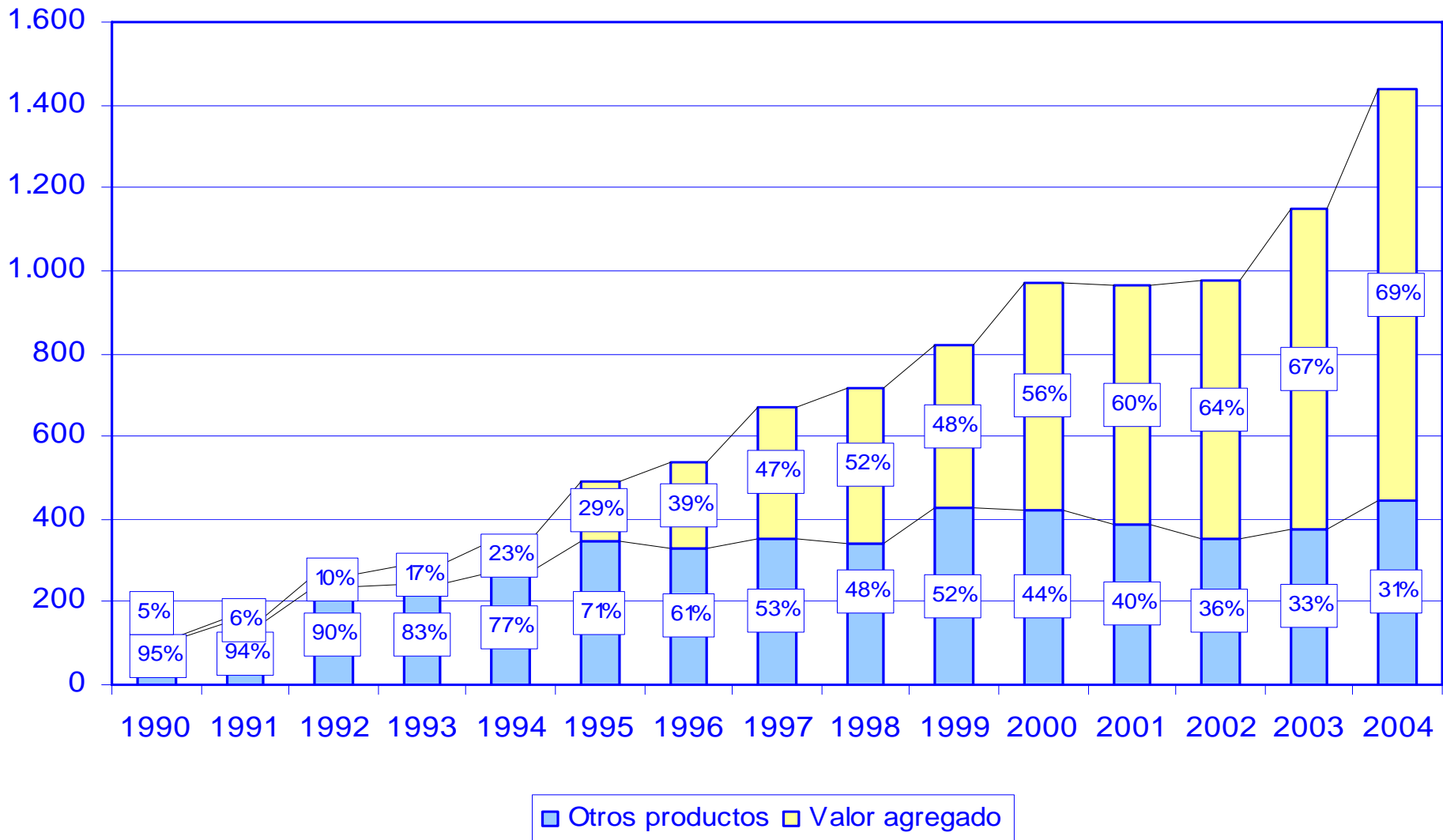
SALMON INDUSTRY CONTRIBUTION TO CHILEAN EXPORTS

2004: us\$ 31.460 Million FOB Chile



ADDING VALUE

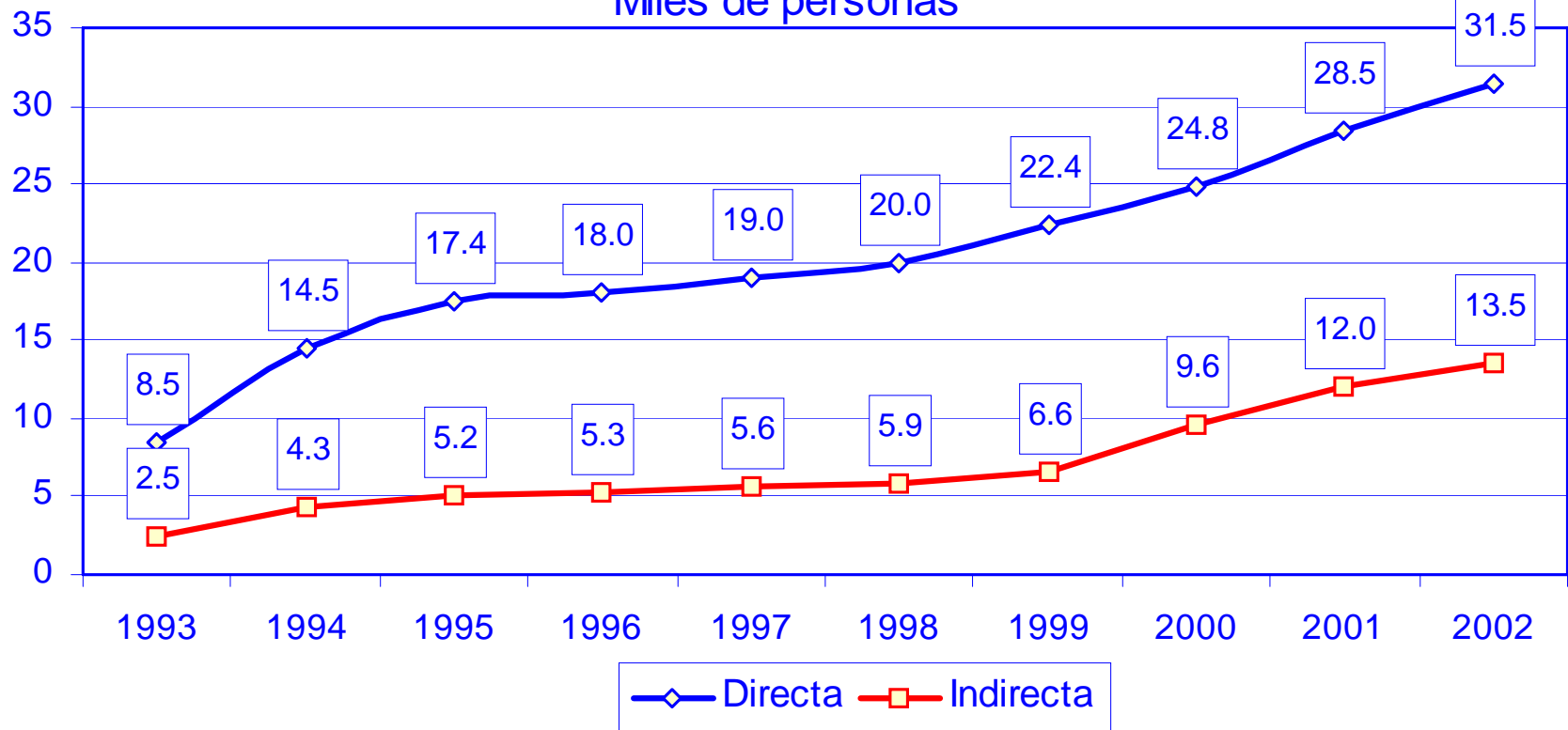
Million dollars FOB Chile



DIRECT AND INDIRECT LABOUR IN THE CHILEAN SALMON FARMING INDUSTRY

Mano de obra en Salmonicultura chilena

Miles de personas





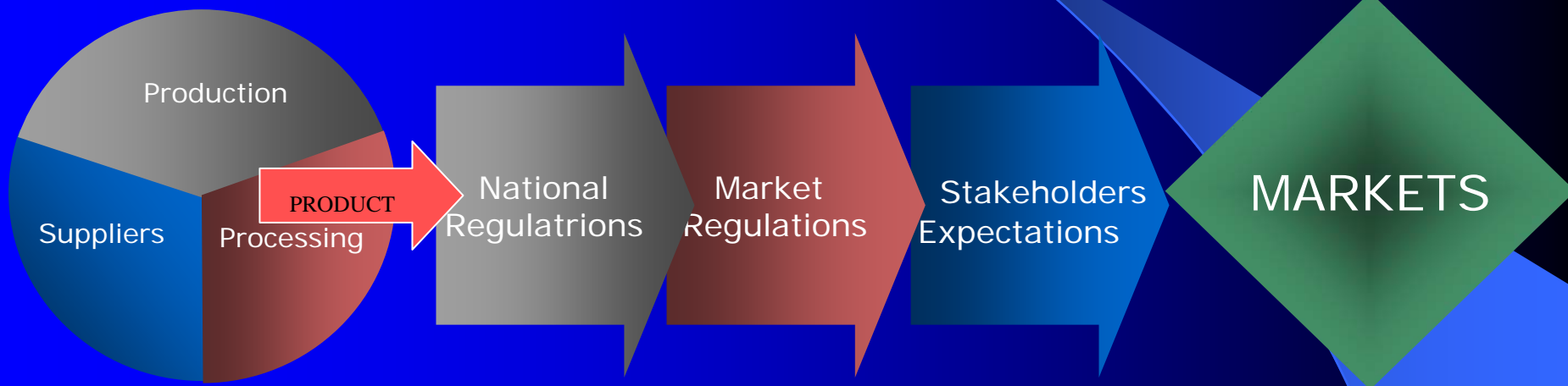
...AN
IMPRESSIVE
PROCESS OF
GROWTH...

...Through this has been possible to satisfy the demand from important foreign markets like USA, Japan and Europe.

REQUIREMENTS FOR THE INDUSTRY



REGULATIONS AND EXPECTATIONS



NATIONAL REGULATION CONTEXT

National Regulations

ENVIRONMENT
PROTECTION

- F and A Law, RAMA
- Environmental Law
- DGA Regulations
- OTHERS

FISH HEALTH

- F and A, Law, RESA
- OTHERS

PROCESS AND
PRODUCTS SAFETY
AND SECURITY

- PAC and Control of residues in products

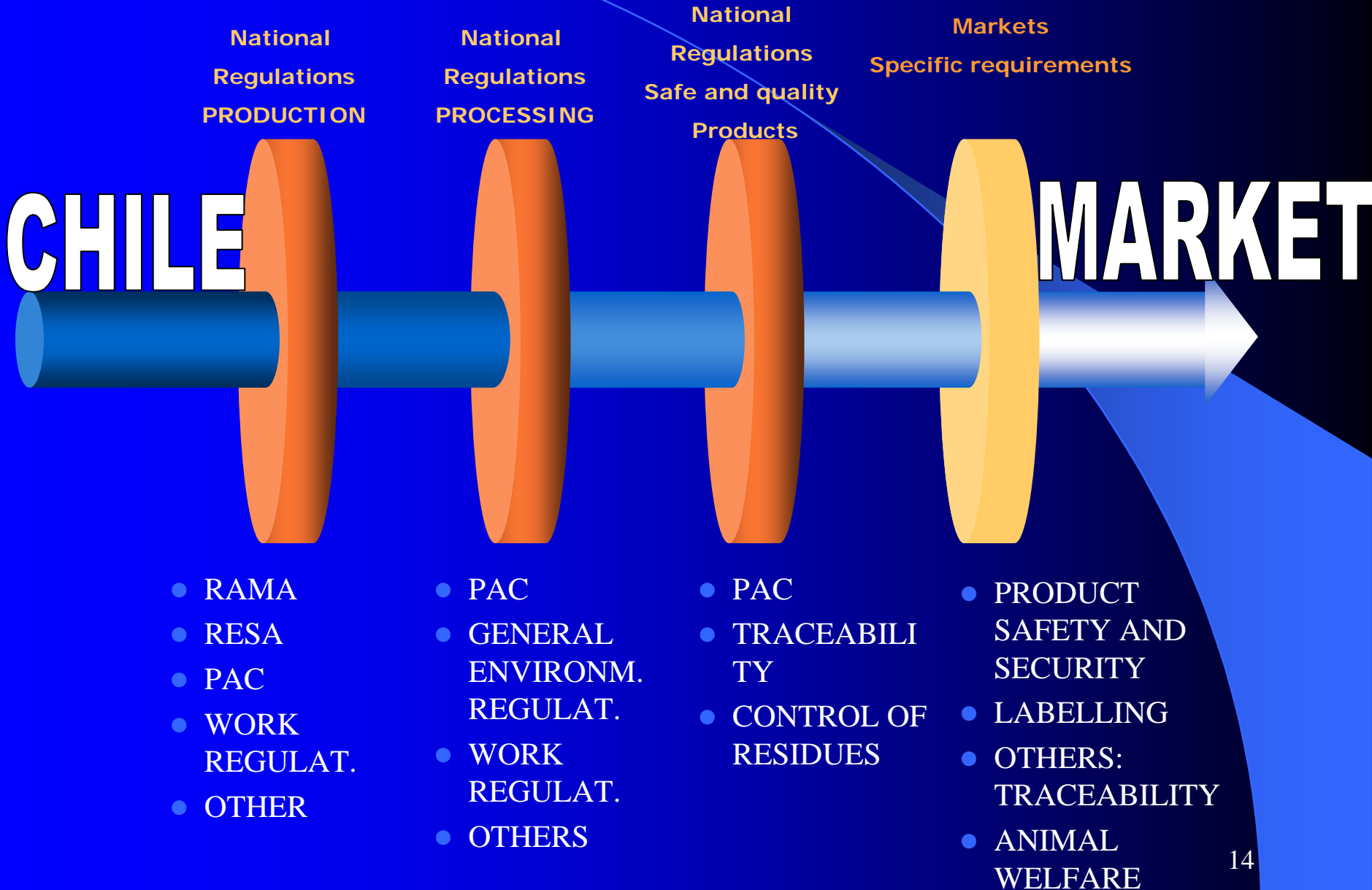
WORKERS AND
OPERATIONS
SECURITY

- Code of Work and norms
- Navigation Law

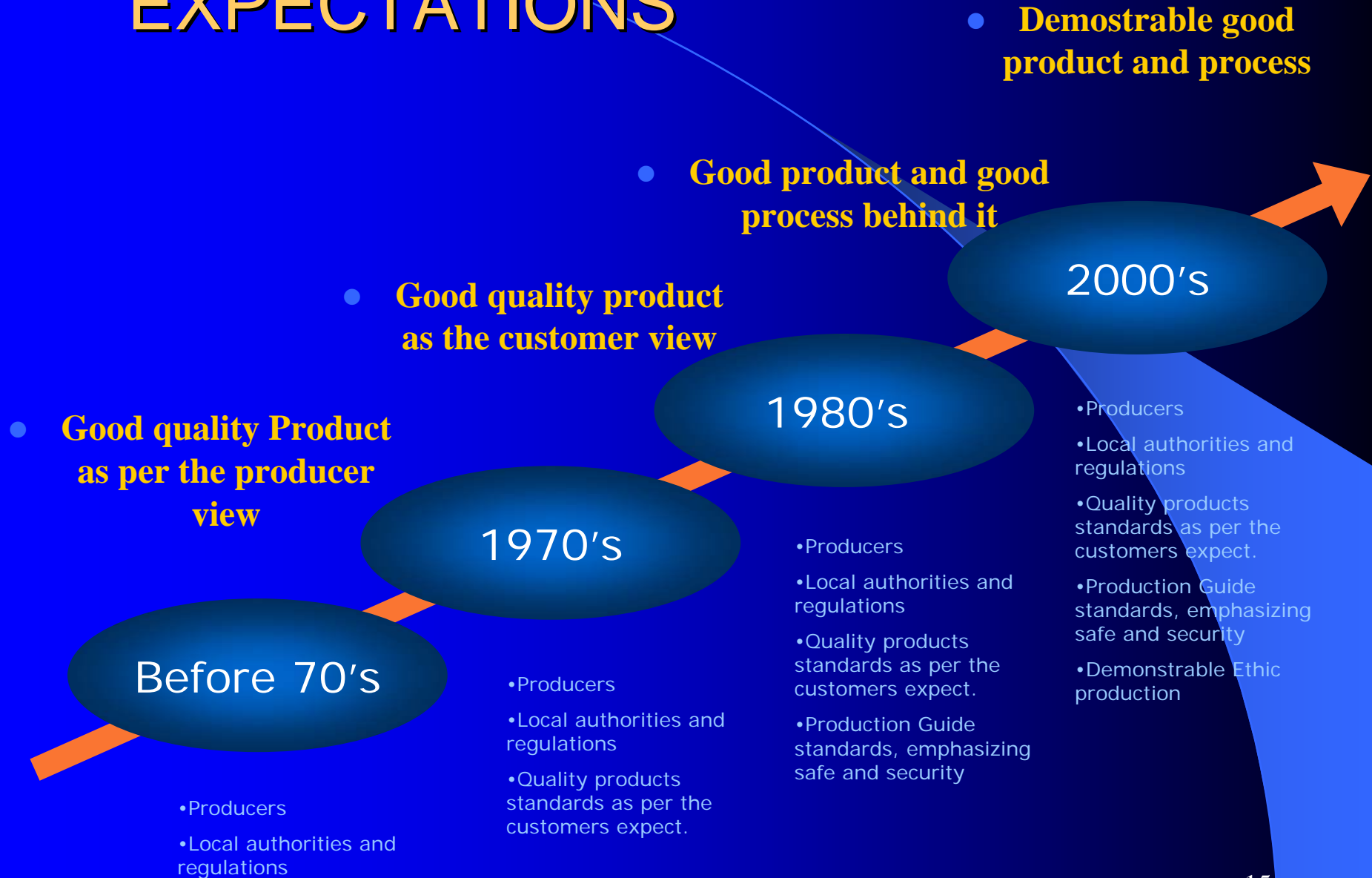
OTHER AREAS

- Coastal zone management
- Human health for products sold in Chile

REGULATION FILTERS



STAKEHOLDERS EXPECTATIONS



FACTORS AND EVOLUTION OF VOLUNTARY INITIATIVES



Market quality assurance.

Mid 80's

- Quality variability was one of the earliest factors to be considered. This triggered the **Quality Seal** which was applied in Processing Plants, establishing standards on processing.
- The Seal was initially private (Fundación Chile) and then it was bought by the Chilean Salmon Farmers Association (also created to face market challenges among others).

HACCP is adopted.

Mid 90's

- In order to assure safe and security of products the HACCP was introduced by Plants, principally due to customers interest.
- Foreign authorities requested the HACCP application in exporting Plants and Sernapesca introduced and promoted its application in Chile.
- The Association private Quality Seal ends.

ISO's emerged in the industry. Late 90's

- Principally ISO 9001 which was essentially applied in Processing plants.
- Slowly ISO 14001 was considered by some companies at the beginning of the 2000's.
- Few providers start with ISO 9001. The most active ones were Feed plants.
- Since 2002, ISO 9001 and 14001 were disseminated in the industry, among producers and providers like: Feed producers, Pharmaceutical Labs, Analysis Labs, Transporters, etc.
- In 2003 few companies also initiated Integrated management system implementation, including simultaneous implementation of ISO 9001, ISO 14001 and OHSAS 18000

Diversification of Certification Systems.

Early 2000's

- FCh promoted a GMP system focused in good environmental practices in salmon production (farms).
- Organic production is also introduced by one company in Chile. This was applied only in part of its production process.
- Different customers request different certification systems like: BRC, IFS. More recently SQF is under development through and agreement between SOTA and FMI.

Industry initiatives emerged. Early 2000's.

- The Cleanest Production Agreement (APL) was initiated at the end of 2002 as a joint initiative of the Chilean Government and the Industry. All salmon producers decided to participate, including more than 300 farms and more than 20 plants distributed between the Metropolitan and XII regions.
- In 2002, SIGES is created by SalmonChile through INTESAL, its Technological Institute of Salmon. This started in 2003, considering environmental and fish health management, product quality and safety, health and security of workers, among the principal aspects, all of them applied along the Value Chain. This system pretends to be an industry platform of good practices, a protection for the industry demonstrating good practices and a benchmarking tool for continuous improvement.
- In 2005 SIGES showed expansion among producers and an initiative to develop SIGES for principal suppliers is considered.

Certification status in the industry.

October 2005

Evaluation based in a 29 producer companies survey

- 12 voluntary systems were identified
- 2 are considered potential systems: SQF and Eurapgap.
- 10 have been effectively applied;
 - 5 are international general systems: 2 ISO's, OHSAS, HACCP and Integrated ISO+OHSAS
 - 2 are international for specific markets: BRC e IFS
 - 3 are national systems: SIGES, APL and BP F.Chile
- Only 2 cover more than 1 aspect along the value chain; Integrated ISO's and SIGES. From them only SIGES establishes verifiable standards and not just continuous improvement commitment.

Certification status in the industry. October 2005

- The most important adopted system is SIGES, involving 17 of the 29 checked companies.
- 11 companies (app. 40 %) have implemented or certified more than 3 system; 17 companies (app. 60%) have implemented between 1 – 3 systems; only 1 company has implemented no system.
- All SalmonChile associated companies evaluated have implemented at least 1 system.

APL AND SIGES



THE ASSOCIATION AND ITS TECHNOLOGICAL INSTITUTE

- SALMON CHILE IS THE ASSOCIATION OF THE SALMON INDUSTRY (WHICH IS CONSIDERED A NATURAL “CLUSTER”)



- INTESAL S.A. IS THE TECHNOLOGICAL ARM OF THE SALMON FARMING ASSOCIATION.





APL

The Cleanest Production Agreement

Cleanest Production Agreement.

- The Salmon Industry Association developed an agreement with the Governmental agencies related to the activity. As per this agreement the industry made the commitment to voluntarily accomplish a number of commitments which benefits the sustainable development of the industry in the joint perception of the government and the industry.
- Commitments accomplishment were regularly evaluated (verified) by Intesal supported by specialized consultants whose results were informed to the agencies and the industry. In the framework of this agreement a number of specific projects directed to improve environmental conducts were also considered.

Cleanest Production Agreement.

- The idea was to apply an integral preventive approach, stimulating the environmental regulation accomplishment avoiding contamination in the origin, improving productive efficiency, optimizing environmental management and diminishin operational risks.
- First stage was directed to introduce good management measures in the companies and then they should develop requiered investment to improve their environmental status.
- This has been the biggest APL developed in Chile in terms of the geographical distribution of the units and diversity of them. This agreement ended at the end of 2004.

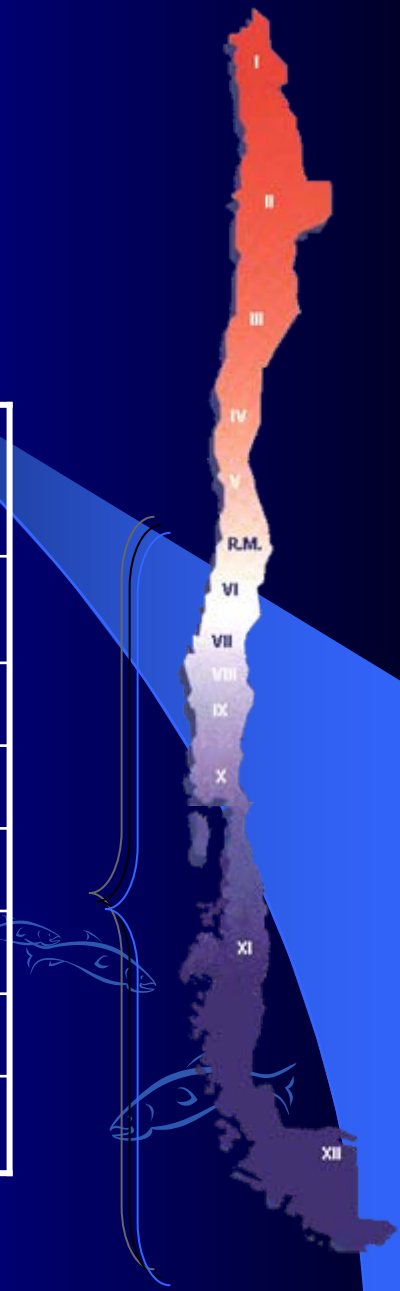
THE APL EFFORT

- The industry accepted and responded to the invitation of the Clean production Secretary of the Ministry of Economy.
- Very extended and disperse distribution of the productive units.
- Multiple actors from the public sector.
- New era of public-private relationship.
- Concrete good results regarding the specific industry commitments.
- First certified productive units in Chile were from this Industry (more than 100 with 100% accomplishment).



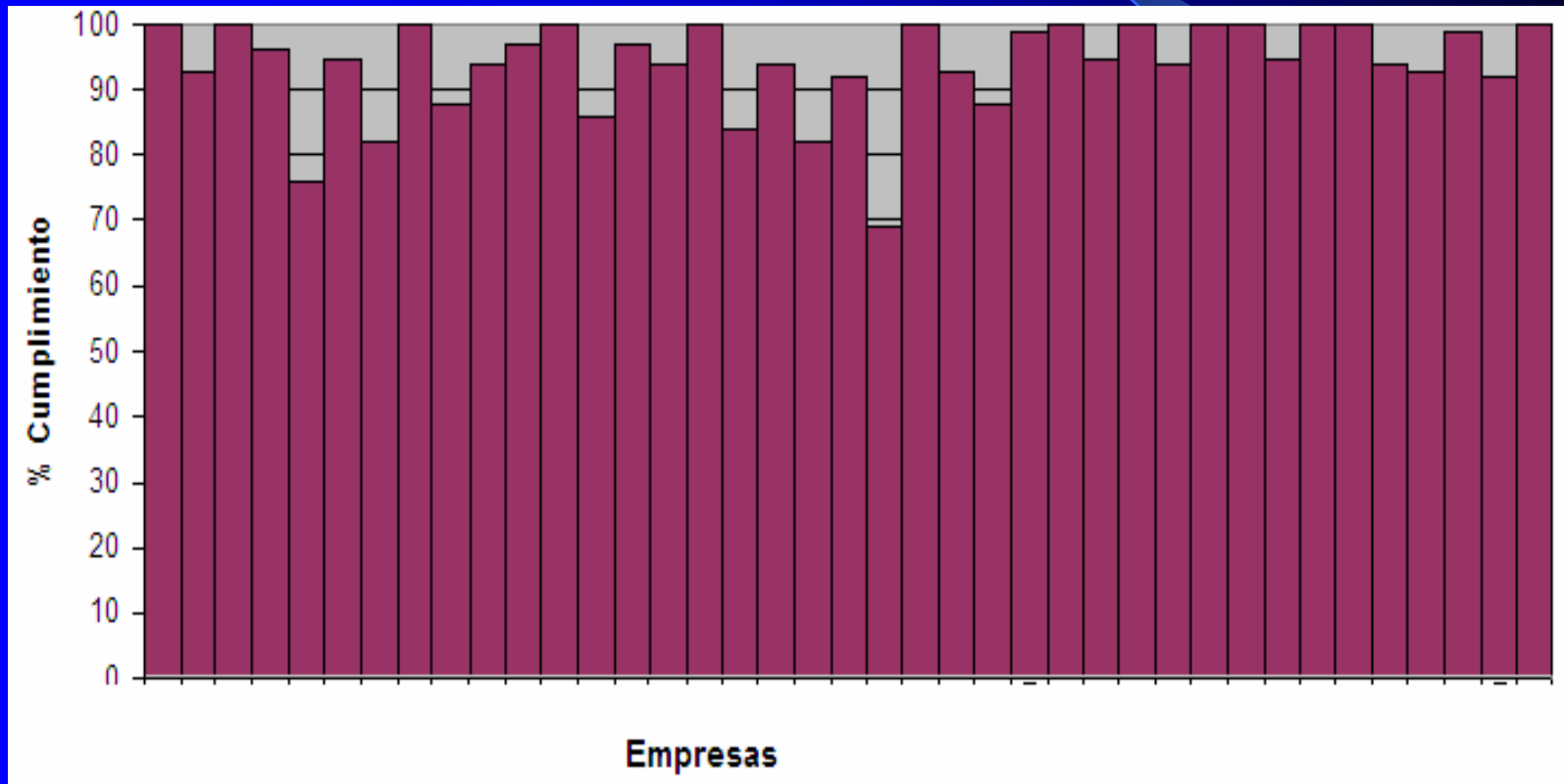
GEOGRAPHIC DISTRIBUTION OF UNITS IN APL

	Piscicultures	Farms	Processing plants	Total
Metropolitana	2	0	0	2
VIII Región	1	0	2	3
IX Región	9	0	0	9
X Región	37	233	24	294
XI Región	6	43	3	52
XII Región	0	10	1	11
Total	55	286	30	371



General Results of Farms

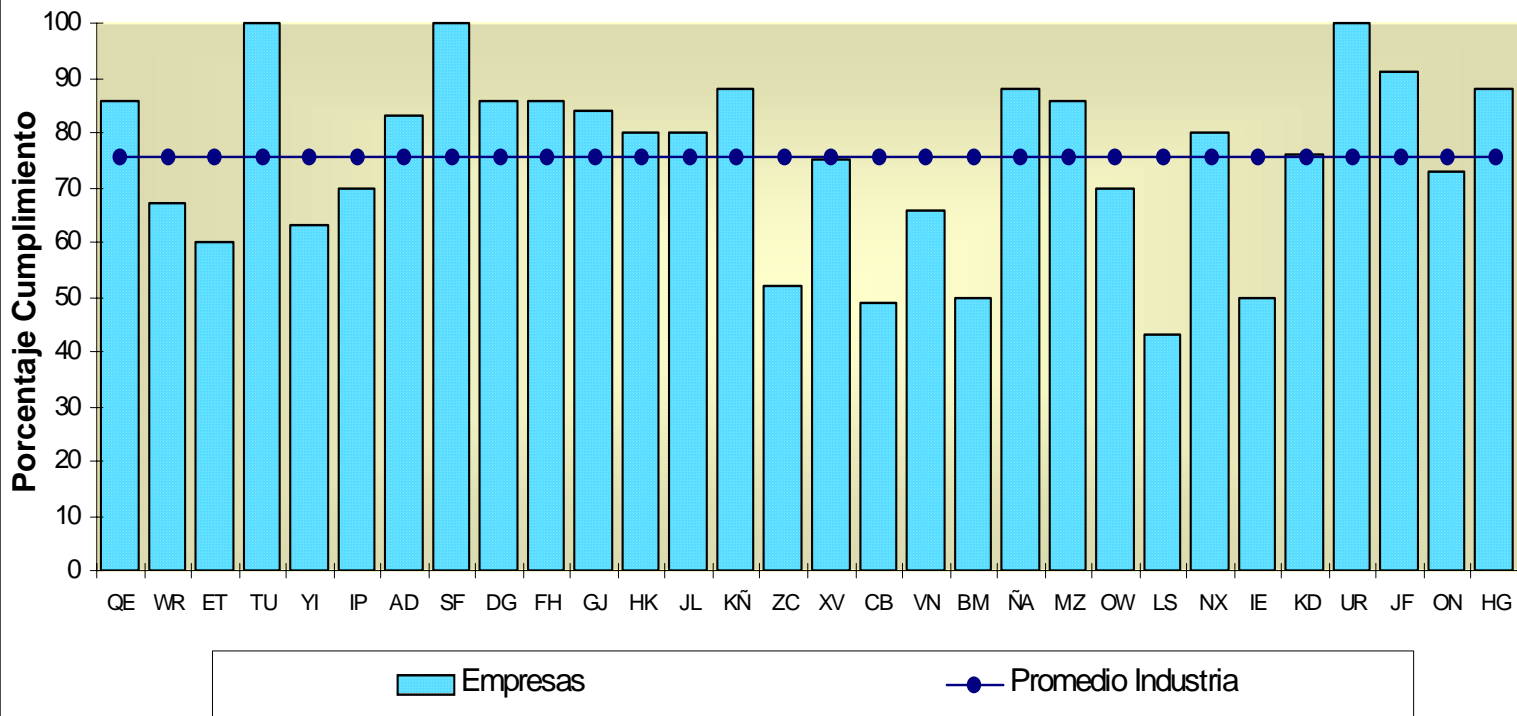
Industry 93 %



General Results of Processing Plants

Industry 75 %

Resultados Quinta Verificación Acuerdo de Producción Limpia de la Industria del Salmón - Plantas de Proceso



APL

Impacts

APL IMPACTS

- Investment:
- USD 12,3 million were invested in effluent treatment systems.
- USD 64,5 million were invested to change fur seal protection nets (new ones of 10”).
- USD 809.400 were invested in adequate waiste disposal.
- USD 13,1 million were invested in new feeding systems that reduce feed lost.
- USD 38.788 were invested in cleanest production training.
- In total the industry invested USD **91,3 million in the APL.**

APL IMPACTS

- General Environmental Impacts
-
- Effluents discharge diminished 4.2 %, representing a reduction of 177.500 m³ in 2004. Also contaminant charge per produced Ton in the effluent was reduced 50 %.
- Solid inorganic waiste were reduced 43,7%.
- Plastic waiste generation was reduced 53 %, equivalent to a reduction of 461.500 t/año.
- Plastic recycling was increased 100%, i.e. 35.500 t/año (compared to 2002).
- Fish byproducts increased 36 %, equivalent to a reuse of 16.330 t in2004.
- 145 Campaigns to clean Beaches were developed.
- More than 3.000 workers were trained in farms and plants in clean production principles and practices.

APL IMPACTS

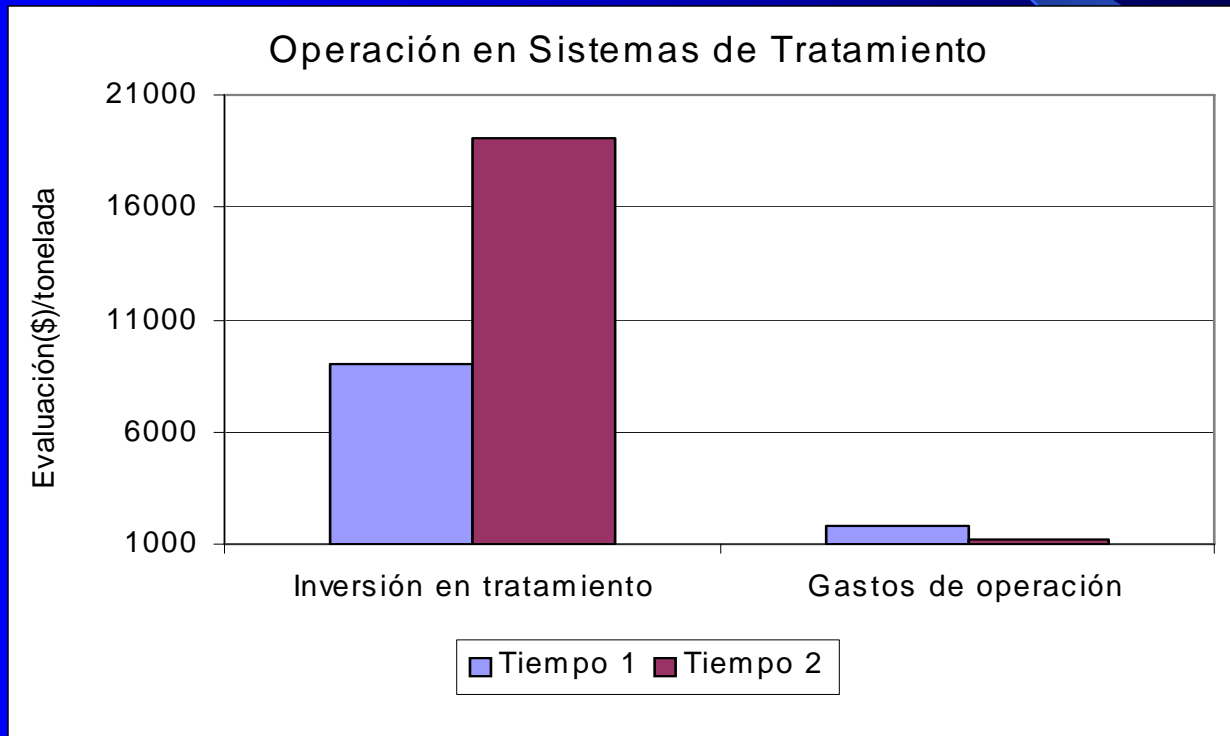
□ Processing plants

- Discharge of fats and oils, BOD and TSS were reduced in around 40%.
- Foam was reduced in 80 %.
- Fish byproducts recycling grew 30 %
- Plastic recycling around 180 %.

● Fams

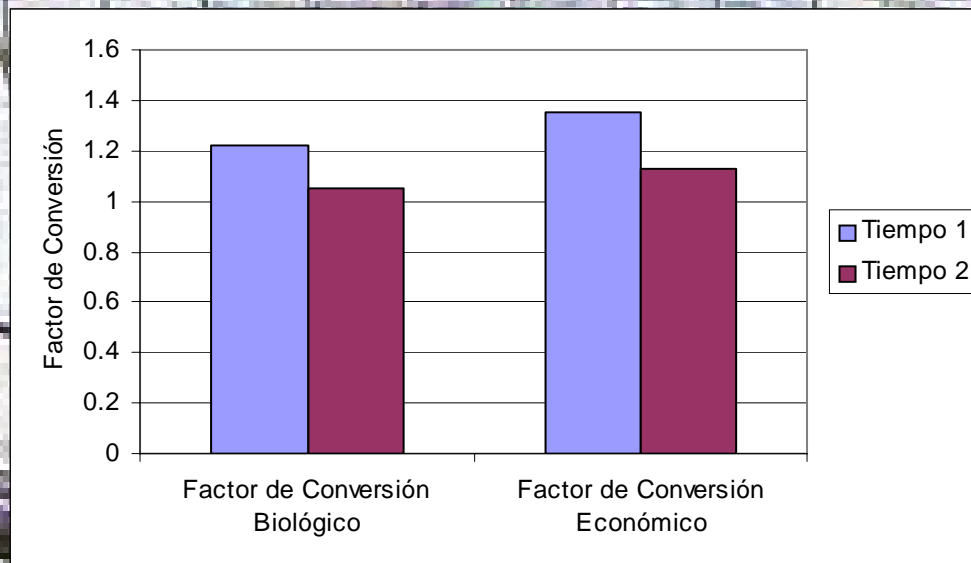
- 14 % reduction in organic solids.
- 72 % reduction in inorganic solids.
- 43 % reduction in dangerous residues.
- Increase in plastic recycling 30 %; and around 180 % in fish residues.

Effluent cost of treatment



NOTA: Los resultados se muestran por tonelada producida.

Conversion factor



GENERAL RESULTS

- Industry diminished 50% contaminant charge in its effluents.
- Also it diminished 14,4% the generation of inorganic residues.
- In 2 years recycling and reutilization of “waiste” increased 100 %.
- In 2 years investment in waiste treatment systems was doubled improving management and diminishing in 33 % the operation cost of these systems.
- More than 3000 workers were trained in Clean Production principles and practices.





Why SIGES was established?

- ✓ Tendencies in international markets: food safety and security, sustainable production, social responsibility.
- ✓ New requirements in international markets regulations: Bioterrorism Act, Traceability.
- ✓ SalmonChile decides to develop through Intesal, an industry sound tool in order to establish verifiable good practices and standards
- ✓ An instrument capable to make real the SalmonChile mission.
- ✓ To act in a proactive way given Chile's leader position in the industry.



What were the requirements established for SIGES?

- IT HAS TO...:
- Be an industry tool.
- Involve critical aspects of salmon farming in the perception of stakeholders.
- Involve experts and companies participation in its original construction.
- Be certifiable by internationally accredited companies.



...IN ESSENCE

“An integrated and complete Good Practices **Platform**, a Protector **Umbrella** able to demonstrate excellence in production and products, and a **Benchmarking** tool stimulating permanent improvement in the industry”.



What is SIGES today?

- A platform of good practices which prepares companies to respond in a best way to certification request from different market segments.
- An umbrella for the global industry defense.
- A benchmarking tool which helps companies continuous improvement and efficient allocation of resources to keep high standards of production.
- A way of keeping companies updated and alert regarding market requirements (legal and voluntary).



SIGES Elements

- Agreement
- SIGES Bylaws
- Regulations and Good Practices Manual
- Auditing Manual (includes checklists)
- Support software (optional)
- SIGES Interactive Internet site. (Management platform with on line access for continuous SIGES improving)



Manual contents

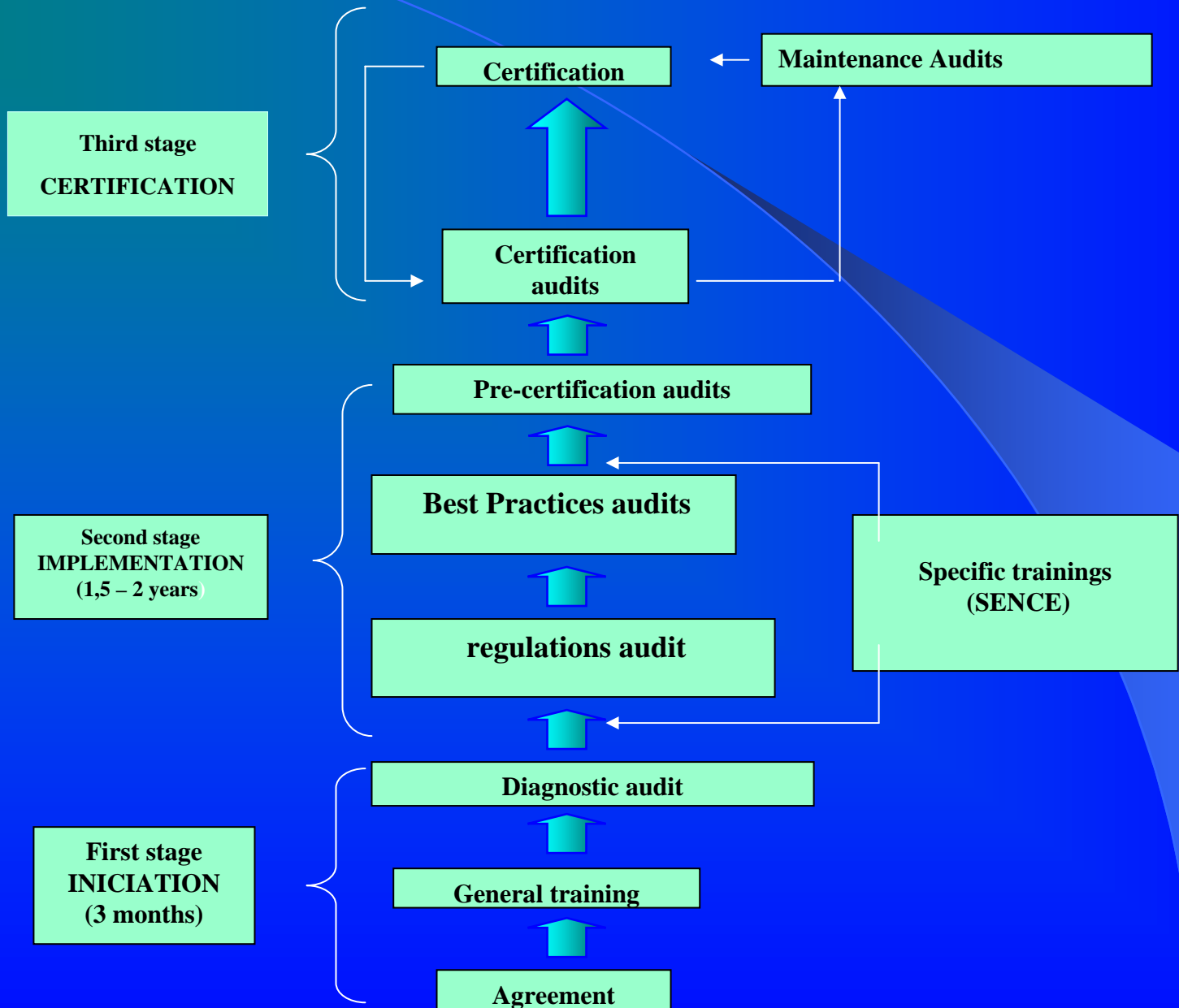
- Manual version 2.0 contents:
- Chapter 1: Management Requirements.
- Chapter 2: Manuals, Policy and Programs, Authorities, Responsibilities, Procedures and Best Practices of the Salmon Industry for piscicultures, lake farms, sea farms, processing plants and central organization .
- Chapter 3: Records, Reports, Protocols and Certificates for piscicultures, lake farms, sea farms, processing plants and central organization .
- All of them in the fields of : food safe and quality; production and fish health; environmental management; and health and security of workers; in two dimensions, regulations and good practices.







STAGES ON SIGES



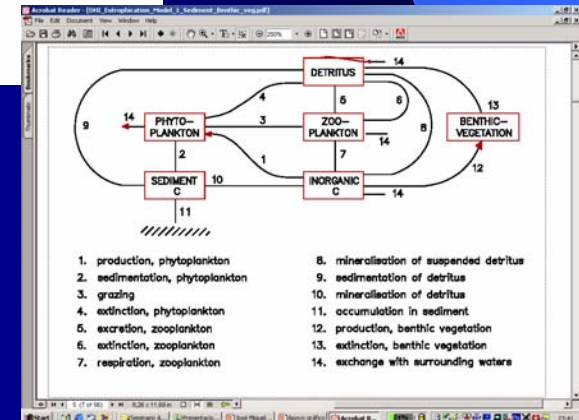
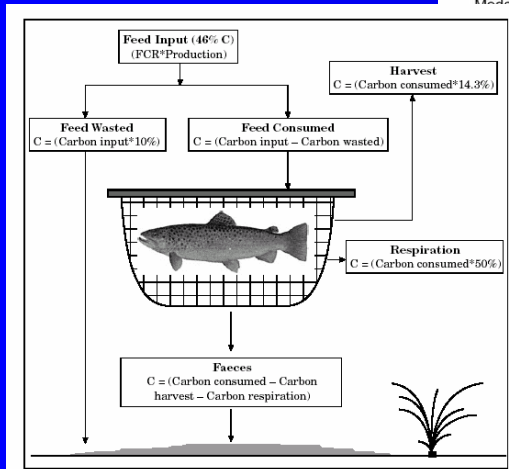
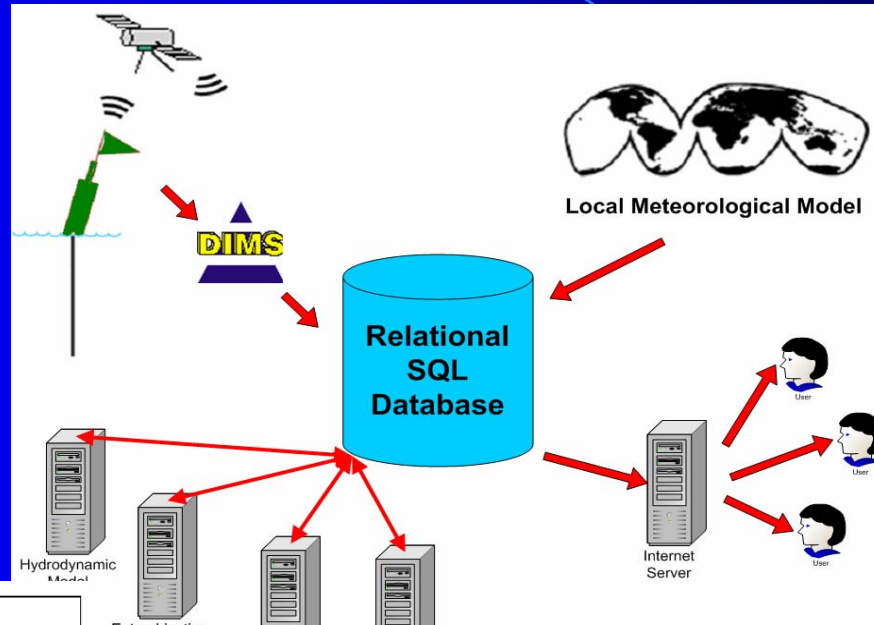


PROSPECTS

- Certification by market segment is and will be a fact.
- SIGES will remain as a platform, umbrella and benchmarking tool of industry.
- SIGES will be extended to other segments of the Salmon Cluster.
- SIGES will be clearly connected to Vigilance programs and Indicators of the Chilean salmon farming industry.
- Additional benefits: Value of benchmarking; Alert on new regulations and management systems; Creation of bridges with the public sector.

Environmental Monitoring and forecast program

<http://pronosticos.salmonchile.cl>



In situ monitoring stations



- Temperatura del agua (1m-10m)
- Salinidad (1m – 10m)
- Corrientes (2 m – 18 m)
- Clorofila a (1 m)
- Oxígeno disuelto (1 m – 10 m)

- Temperatura (1m-10m)
- Salinidad (1m-10m)
- Oxígeno (1m-10m)
- Clorofila a (1m)
- Corrientes (2m-18m)
- Meteorología (vientos, t, pluviosidad, rad. solar, humedad, presión atm.)

- Temperatura (1m-10m)
- Salinidad (1m-10m)
- Oxígeno (1m-10m)

Sitio Web de Pronósticos

Pronósticos Ambientales - Microsoft Internet Explorer

Archivo Edición Ver Favoritos Herramientas Ayuda

Dirección <http://pronosticos.salmonchile.cl/> Ir Norton AntiVirus

 **SalmonChile - INTESAL**
Manejo Integral de la Salmonicultura a través de un enfoque ecosistémico utilizando técnicas de percepción remota y técnicas oceanográficas de última generación

 GOBIERNO DE CHILE
CORFO



**BIENVENIDOS AL SISTEMA
DE PRONOSTICOS AMBIENTALES
PARA LA INDUSTRIA DEL SALMON**

PRONOSTICO

ANTECEDENTES
PRONOSTICOS
REGISTROS HISTORICOS
INFORMES TECNICOS
SERVICIOS
PREGUNTAS FRECUENTES
SITIOS RELACIONADOS
DEMO

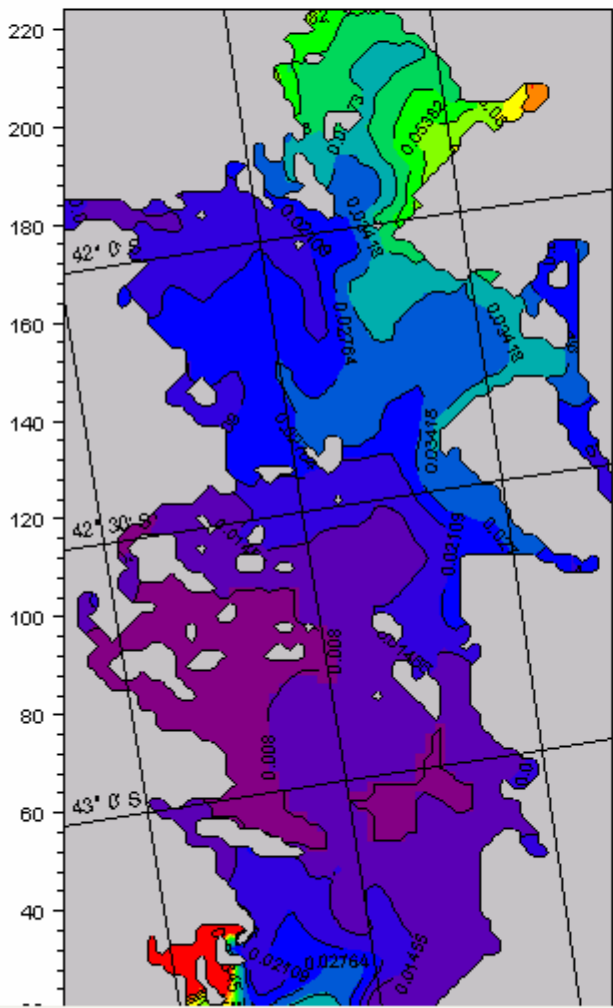


Listo Internet

Inicio Bandeja de entr... Programa de I&... Microsoft Power... SalmonChile - Mi... Pronósticos Ambi... ES 18:03

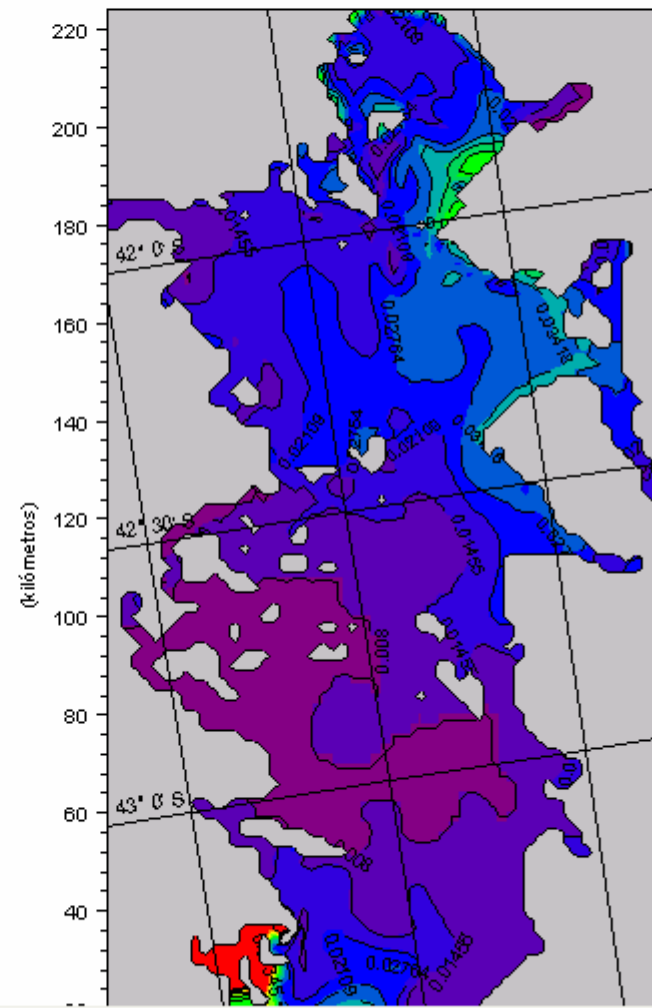
Concentración de fitoplancton C en superficie

2005-10-10 12:00:00



Concentración de fitoplancton C profundidad 10m

2005-10-10 12:00:00



11.14.2009 5:54:17

INICIO

INTRODUCCION

ZONAS

PARA IMPRIMIR

CONCLUSIONES

RESUMEN EJECUTIVO



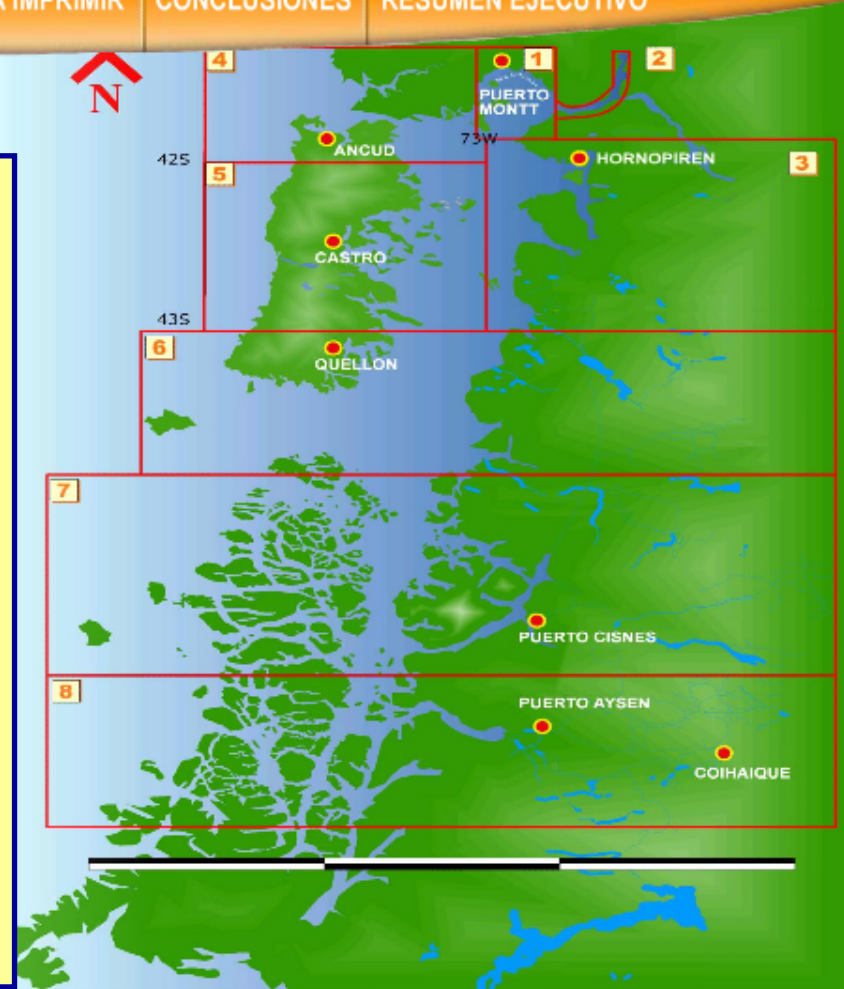
SalmonChile INTESAL

- The **Surveillance Programme** has been the basis to generate and execute a sanitary management plan to optimise the sanitary status of the industry.

-The **objective** of the Surveillance Programme is to receive, process, and analyse sanitary and productive data from the monthly report of the companies and integrate them, in an innovative fashion, with environmental variables.

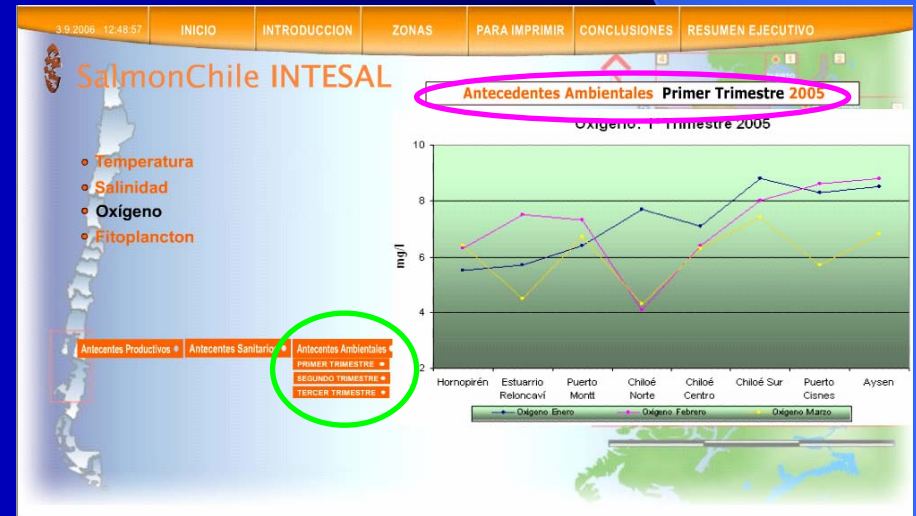
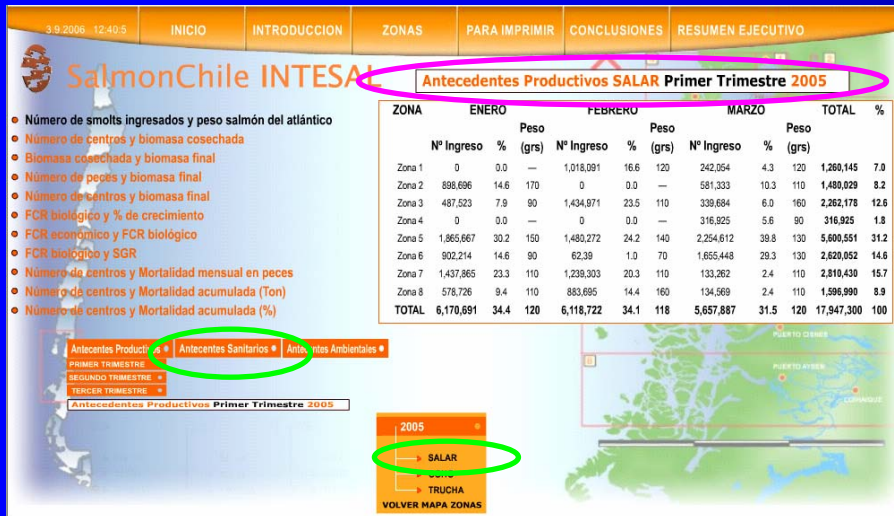
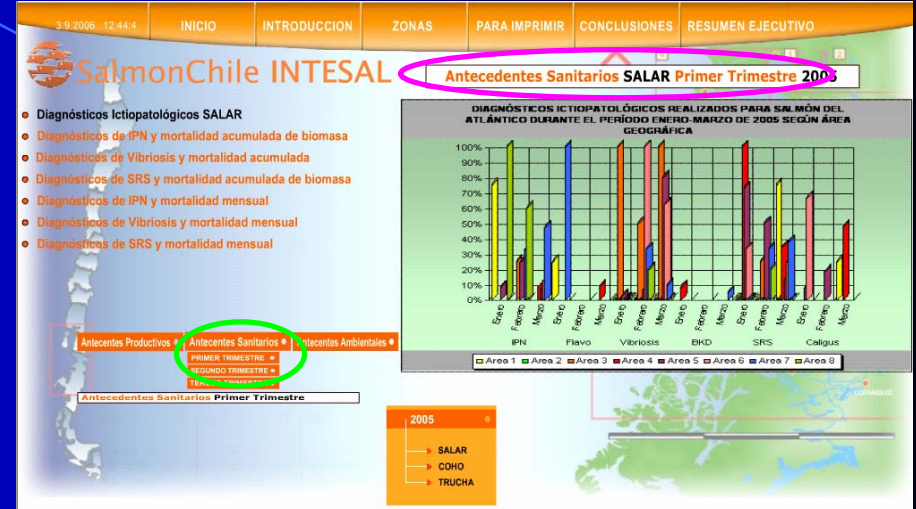
- The Programme generates **quarterly reports, geo-referenced in eight homo-environmental zones** and distributed to the associated companies through its corresponding technical department.

- The Programme represents an excellent tool to support **sanitary strategies to mitigate** the negative impact of disease over salmon production, prioritise actions, strengthen the public-private institutional work, and optimise resources.



Sanitary and Productive Surveillance Programme

<http://bases.salmonchile.cl/salud/>



Sanitary and Productive Surveillance Programme

<http://bases.salmonchile.cl/salud/>

SalmonChile INTESAL

SalmonChile INTESAL

INFORME DE VIGILANCIA SANITARIA Y PRODUCTIVA DE LA INDUSTRIA

INFORME TECNICO N° 1

PRIMER TRIMESTRE 2005

INFORME DE VIGILANCIA SANITARIA Y PRODUCTIVA DE LA INDUSTRIA

INFORME TECNICO N° 2

SEGUNDO TRIMESTRE 2005

INFORME DE VIGILANCIA SANITARIA Y PRODUCTIVA DE LA INDUSTRIA

INFORME TECNICO N° 3

TERCER TRIMESTRE 2005



SalmonChile INTESAL

CONCLUSIONES TRIMESTRE ENERO - MARZO 2005

Se observa un crecimiento constante en la industria durante este trimestre en relación con la utilización y apertura de centros en las diversas áreas determinándose un aumento de un 6% en salmón del atlántico, 5% para trucha arco iris y un 50% en salmón coho con una evolución total de centros desde 212 a 235 de enero a marzo. En este sentido, las principales áreas de crecimiento fueron Chiloé Centro, Chiloé Sur, Cisnes / Melinka y Aysén.

Porcentualmente y de manera general, el cultivo de las diversas especies presenta zonas definidas de cría, observándose el cultivo principal de salmón del atlántico en las áreas de Puerto Montt, Fiordo Comau, Chiloé Norte y Chiloé Centro, para trucha arco iris Estuario de Reloncaví y en menor medida Chiloé Sur, finalmente salmón coho en Chiloé Sur, Cisnes / Melinka y Aysén.

El 28% del total de centros, 80 de 235, se encuentran ubicados en el área geográfica determinada como Chiloé Centro, conviviéndose en la principal área de cultivo regional.

Durante este periodo el 46% del ingreso de los smolts correspondieron a salmón coho (principalmente durante enero y febrero); un 36% a salmón del atlántico y un 17% de trucha arco iris durante marzo.

Más del 80% de los smolts ingresados a las distintas áreas geográficas durante este periodo enero-marzo fueron ingresados a temperaturas menores a 12,5°C (10 mts de profundidad). Además, los pesos promedio de ingreso presentaron esquemas bastante definidos, salmón coho desde 65 a 150 grs, salmón del atlántico de 100 a 130 grs y trucha arco iris de 130 a 300 grs.

Durante el trimestre enero-marzo de 2005 la biomasa total de salmón del atlántico y trucha arco iris se mantuvieron estables por área geográfica. En relación a salmón coho, presentó un aumento sistemático en relación con la evolución temporal de enero a marzo.

En la zona de Cisnes y Aysén se observó aumento gradual de la salinidad desde 24,2 pptn en enero a 29,8 pptn en marzo, desarrollándose el mayor ingreso de salarías y cohos durante el mes de enero.

El área de Puerto Montt presenta las temperaturas más bajas y los crecimientos son también inferiores en todas las especies en este periodo de tiempo en comparación con las otras áreas.

Las mortalidades porcentuales mensuales se relacionan en gran medida con las variables ambientales, así tenemos que para el Estuario de Reloncaví durante febrero y marzo en donde existió alza de temperatura (17,6° C) y disminución de la concentración de

SalmonChile INTESAL

RESUMEN EJECUTIVO INFORME DE VIGILANCIA SANITARIA Y PRODUCTIVA DE LA INDUSTRIA

INFORME TECNICO N° 1

PRIMER TRIMESTRE 2005

RESUMEN EJECUTIVO INFORME DE VIGILANCIA SANITARIA Y PRODUCTIVA DE LA INDUSTRIA

INFORME TECNICO N° 2

SEGUNDO TRIMESTRE 2005

RESUMEN EJECUTIVO INFORME DE VIGILANCIA SANITARIA Y PRODUCTIVA DE LA INDUSTRIA

INFORME TECNICO N° 3

TERCER TRIMESTRE 2005



THANKS!

