SOCIO-ECONOMIC BENEFITS OF MET-OCEAN INFORMATION AND SERVICES

John W Zillman

JCOMM-III, Marrakech, 5 November 2009

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- The origins of international cooperation in meteorology and oceanography
- The concept of a met-ocean service system
- The nature of met-ocean services
- The users and applications of met-ocean services
- The benefits of met-ocean services
- Quantifying the value of met-ocean services
- An economic model for service provision
- Enhancing the benefits of met-ocean services
- Some thoughts on what JCOMM can do

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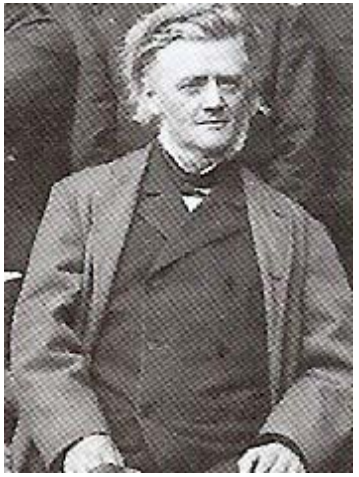
PIONEERS OF INTERNATIONAL COOPERATION IN METEOROLOGY AND OCEANOGRAPHY

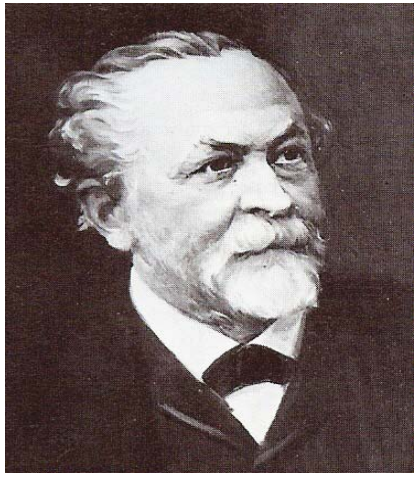
M F Maury



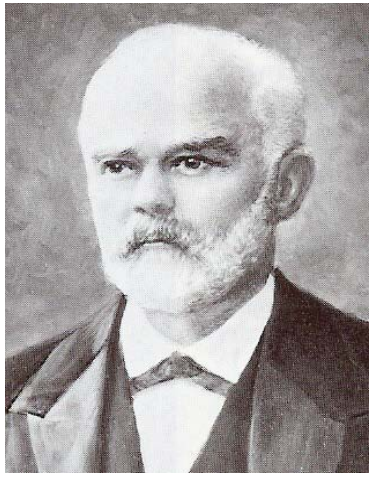
G B Neumayer

R FitzRoy

C H D Buys Ballot



H Wild



E Mascart

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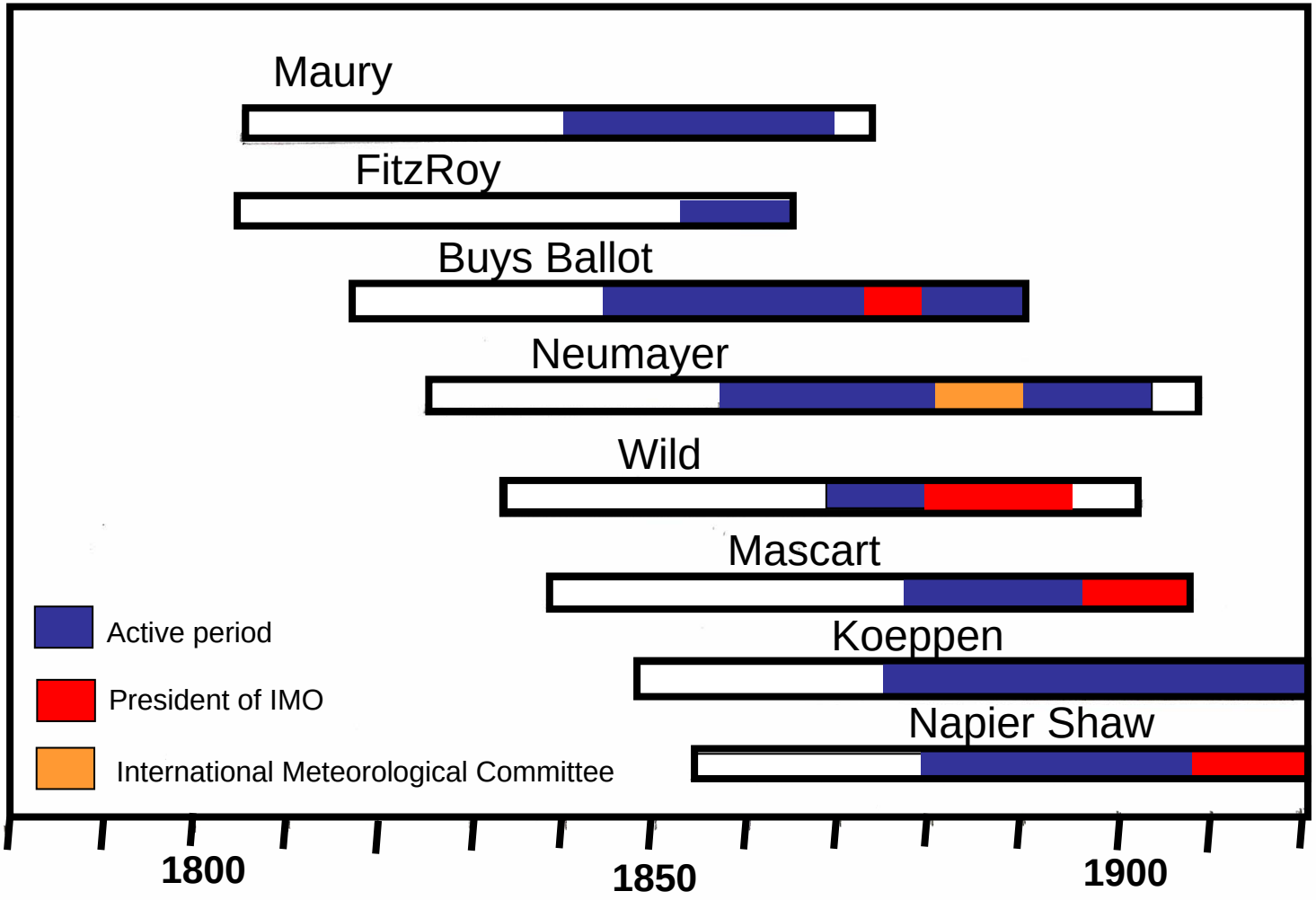
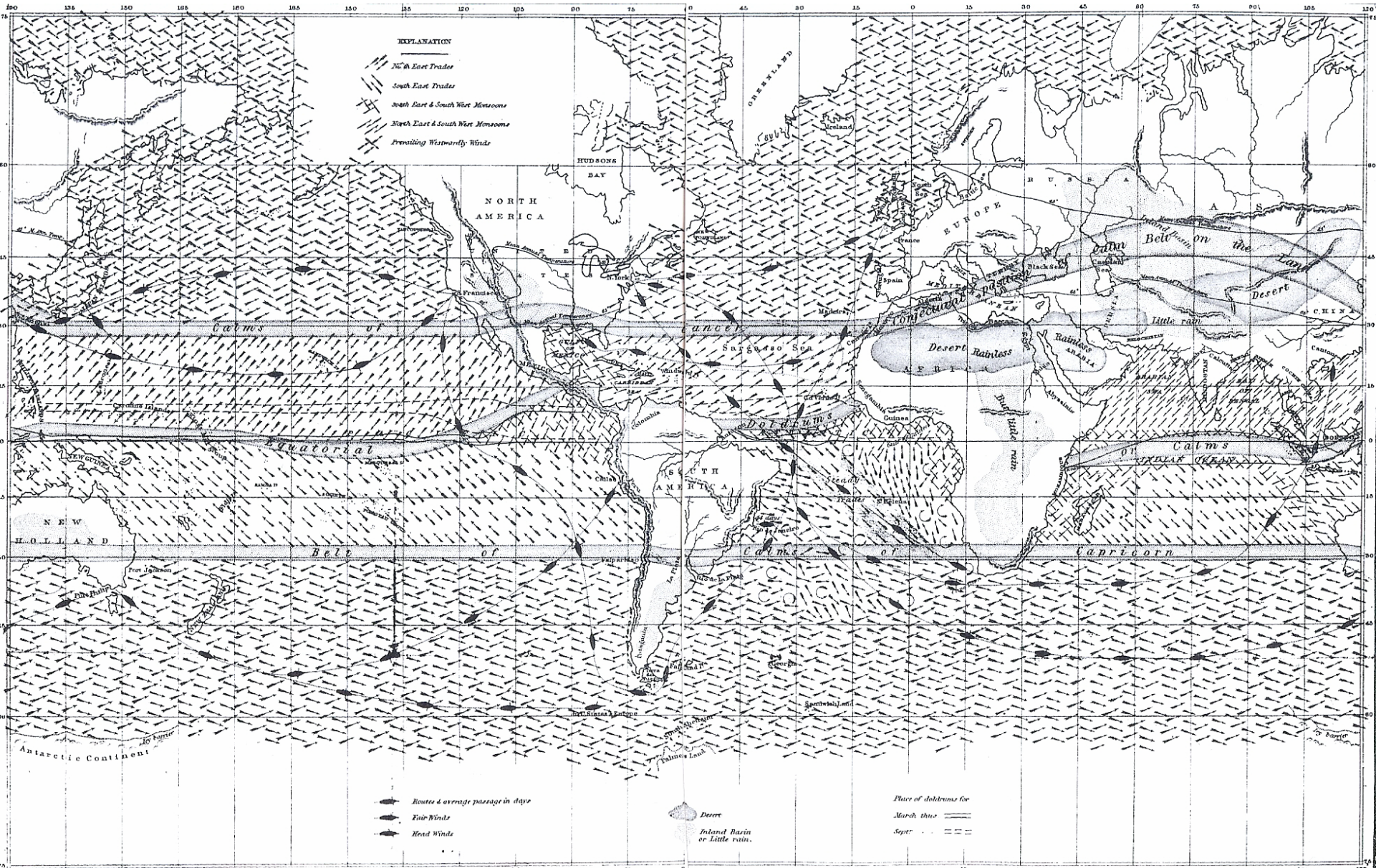


MATTHEW FONTAINE MAURY 1806-73

MAURY'S CHART OF WINDS AND OCEAN ROUTES



MATTHEW FONTAINE MAURY (1855) ON THE OUTCOME OF THE BRUSSELS CONFERENCE OF AUGUST 1853

"This conference …. recommended a plan of observations which should be followed on board the vessels of all friendly nations…"

"In peace and in war these observations are to be carried on and, in case any of the vessels on board of which they are conducted may be captured, the abstract log .. is to be held sacred."

"This plan contemplates the cooperation of all the states of Christendom, at least so far as the form, method, subject of observations, time of making them, and the interchange of results are concerned. I hope that my fellow citizens will not fail to second and cooperate in such a humane, wise and noble scheme"

(The Physical Geography of the Sea and its Meteorology, 1855)

DEVASTATING STORMS DURING THE SIEGE OF SEBASTAPOL

GEORG BALTHASER NEUMAYER 1826-1909

INVITATION TO THE AUGUST 1872 LEIPZIG CONFERENCE

“ At the present time, the increasing interest in meteorological research shown by all civilized countries has led to a demand for far-reaching coordination and standardization of the methods and procedures in use in different countries. Such suggestions have been put forward and discussed so frequently ….. that the undersigned consider it both feasible and timely to propose the convening of a meteorological conference…..”

Wild (St Petersburg)

Bruhns (Germany)

Jelinek (Austria)

FIRST INTERNATIONAL METEOROLOGICAL CONGRESS, VIENNA, 2-16 September 1873

- Convened by the Government of Austria
- 32 delegates from 20 countries
- Standardisation of instruments, hours of observation
- Principle of mutual exchange of observations by telegraph
- Need for a permanent international meteorological organization
- Establishment of the Permanent Committee

SECOND INTERNATIONAL METEOROLOGICAL CONGRESS, ROME 1879

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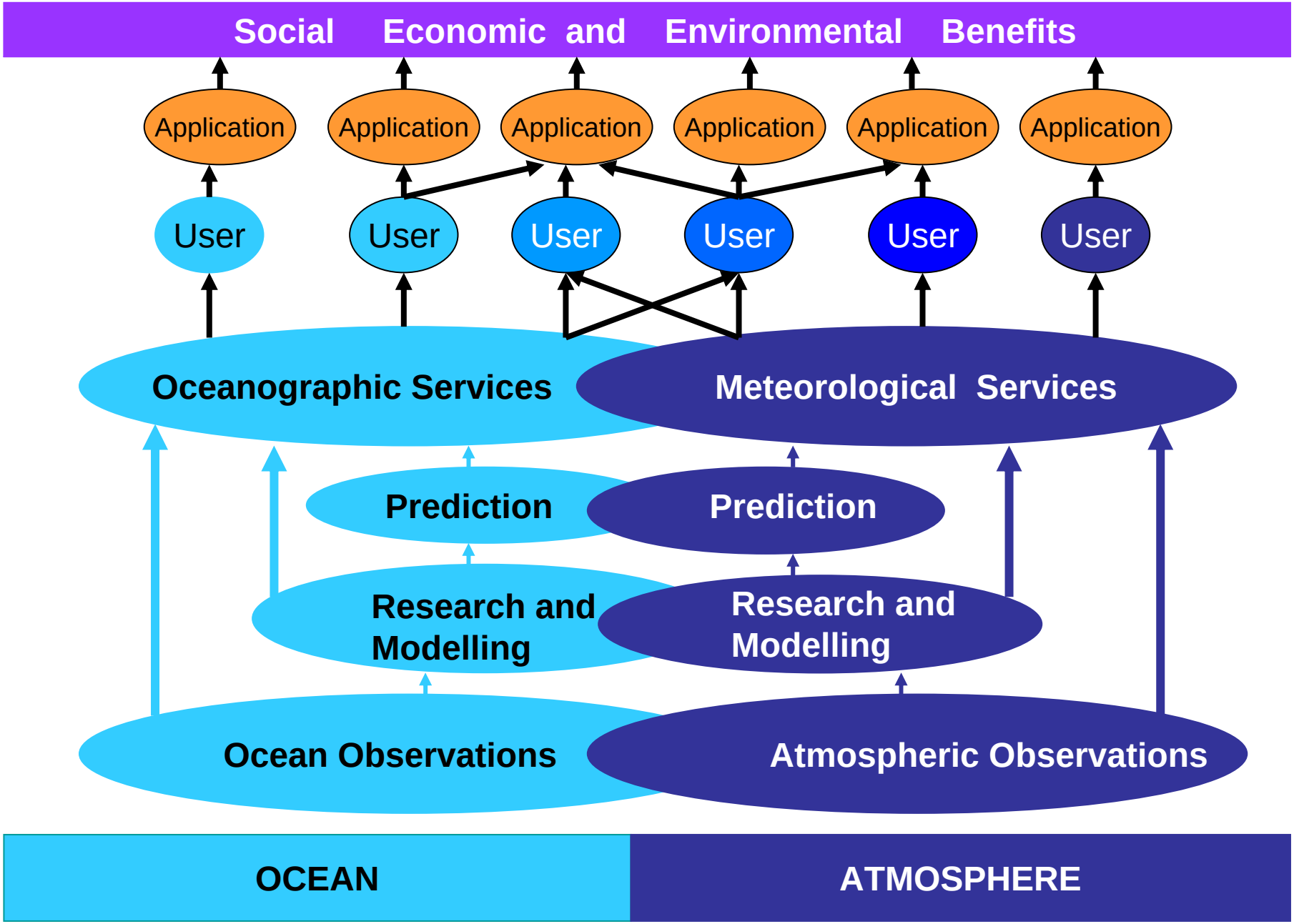
A METEOROLOGICAL AND OCEANOGRAPHIC SERVICE SYSTEM



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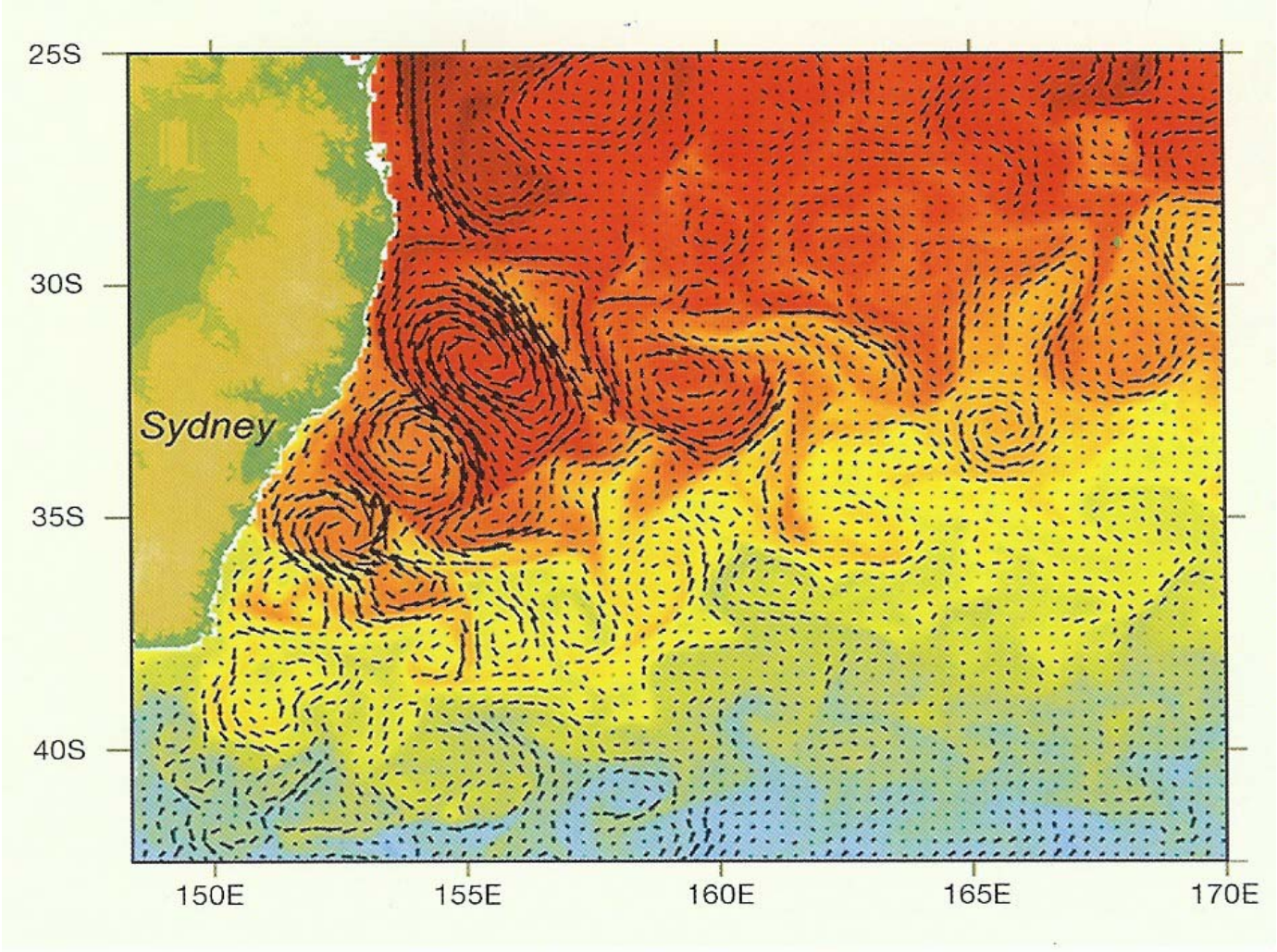
CATEGORISATION OF MET-OCEAN SERVICES

- **Type of service** - basic data, analysis, forecast, warning, advice, investigation
- **Time frame** - instantaneous or average conditions for various periods in past, present or future
- **Space scale** – point, local, regional or global; coastal waters or high seas
- **Atmospheric variable** – pressure, wind, temperature, cloud, humidity, precipitation, fog etc
- **Ocean variable** – sea level, currents, temperature and salinity (surface, sub-surface), waves, dissolved gases, plankton, chlorophyll, dissolved organic matter, sediment etc
- **Marine phenomenon** – hurricanes, cyclones, storms, squalls, ice, tsunamis, surges etc

A 24 HOUR SEA TEMPERATURE AND CURRENT FORECAST FROM THE AUSTRALIAN BLUE LINK SYSTEM

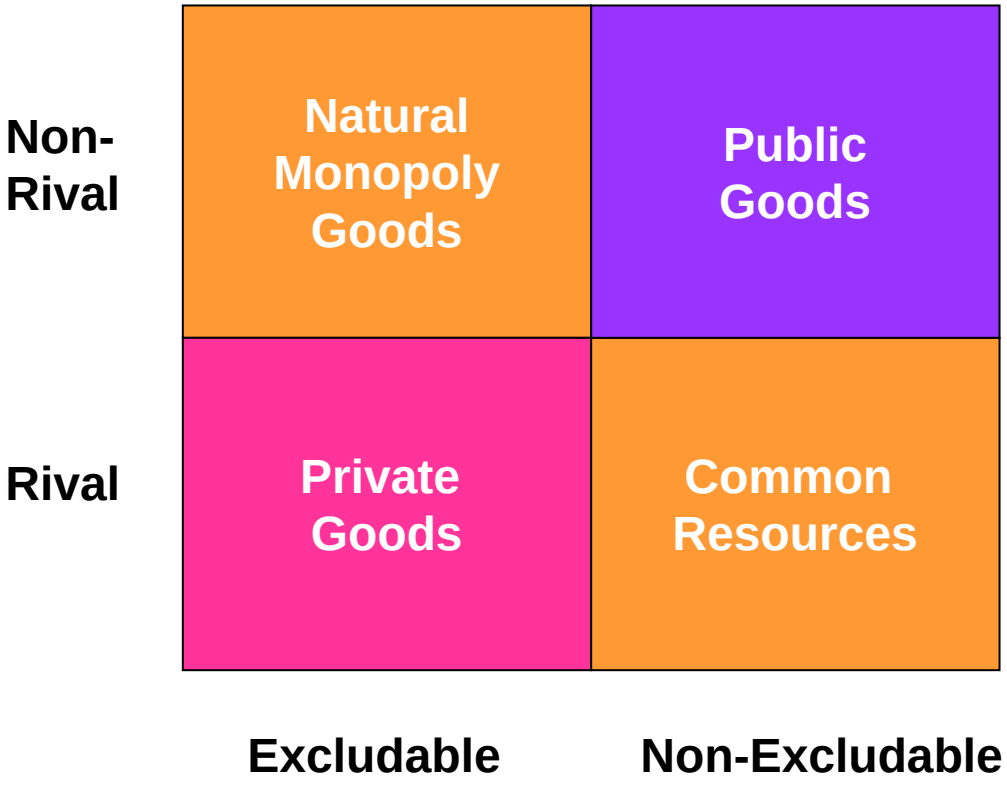


ECONOMIC CATEGORISATION OF GOODS AND SERVICES

A good or service is:

- **Rival** if one person's consumption means that it is no longer available for consumption by others
- **Non-rival** if one person's consumption leaves it undepleted and equally available for use by others
- **Excludable** if it is possible to make it available for one consumer while excluding all others
- **Non-excludable** if it is impossible or extremely difficult, having made it available to one, to exclude others

ECONOMIC CHARACTERISATION OF GOODS AND SERVICES



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USERS AND APPLICATIONS OF MET-OCEAN SERVICES

Users	Applications
• Shipping on the high seas	• Safe and efficient navigation; ship routing
• Port authorities	• Port and harbour management
• Fishing industry	• Catch location , safe and effective operation
• Naval operation	• Navigation, submarine detection etc
• Maritime safety	• Marine disaster avoidance and rescue
• Emergency response agencies	• Oil slick tracking, environment protection
• Design and construction engineers	• Design/installation coastal/offshore facilities
• Offshore oil and gas facilities	• Safe and efficient operation
• Coastal management authorities	• Coastal planning and protection
• Energy and water supply agencies	• Renewable energy and desalination plant design and operation
• Health authorities	• Reducing risks to public health
• Tourism industry	• Safety, planning and operation of facilities
• Recreational fishers, sailors, swimmers and divers	• Safe and enjoyable recreation
• Research community	• Research into atmospheric/ocean processes

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SOCIAL, ECONOMIC AND ENVIRONMENTAL BENEFITS OF METEOROLOGICAL AND OCEANOGRAPHIC SERVICES

- Reduction of the impact of natural disasters
- Economic development and prosperity of primary, secondary and tertiary industry
- Safety of life and property
- National and international security
- Preservation and enhancement of the quality of the environment
- Community health, recreation and quality of life
- Efficient planning, management and operation of government and community affairs
- Provision of information needs of future generations
- Advancement of knowledge and understanding of the natural systems of the planet.

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ECONOMIC VALUE OF PRIVATE AND PUBLIC GOODS

- For services that are **private goods**, the economic value of the service is essentially the **price that the highest bidder is willing to pay**

- For services that are **public goods**, the economic value of the service, which has to be weighed against the cost of provision, is **the <u>total</u> of all the benefits derived by <u>all the users</u>**

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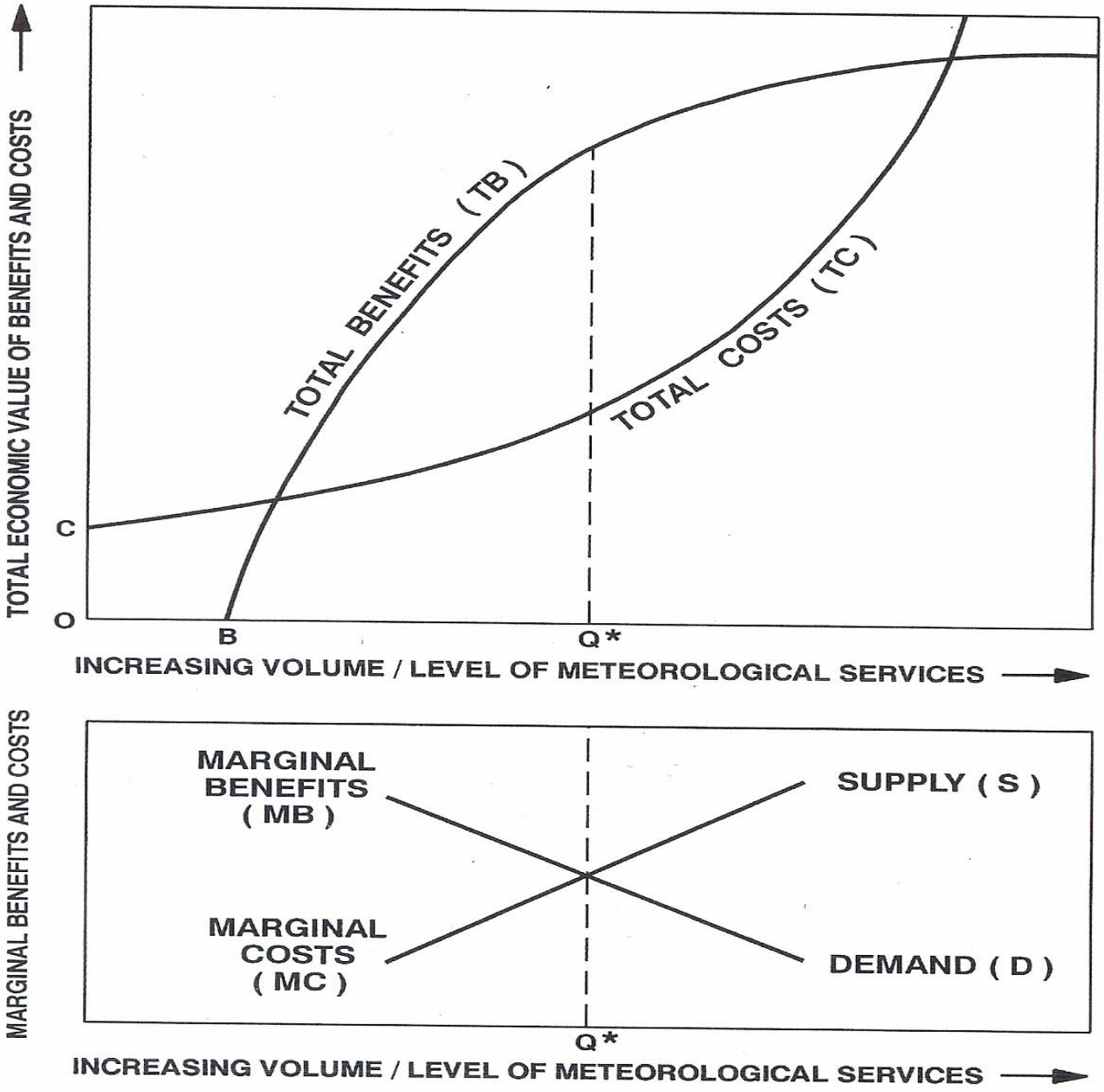
AN ECONOMIC MODEL FOR SERVICE PROVISION



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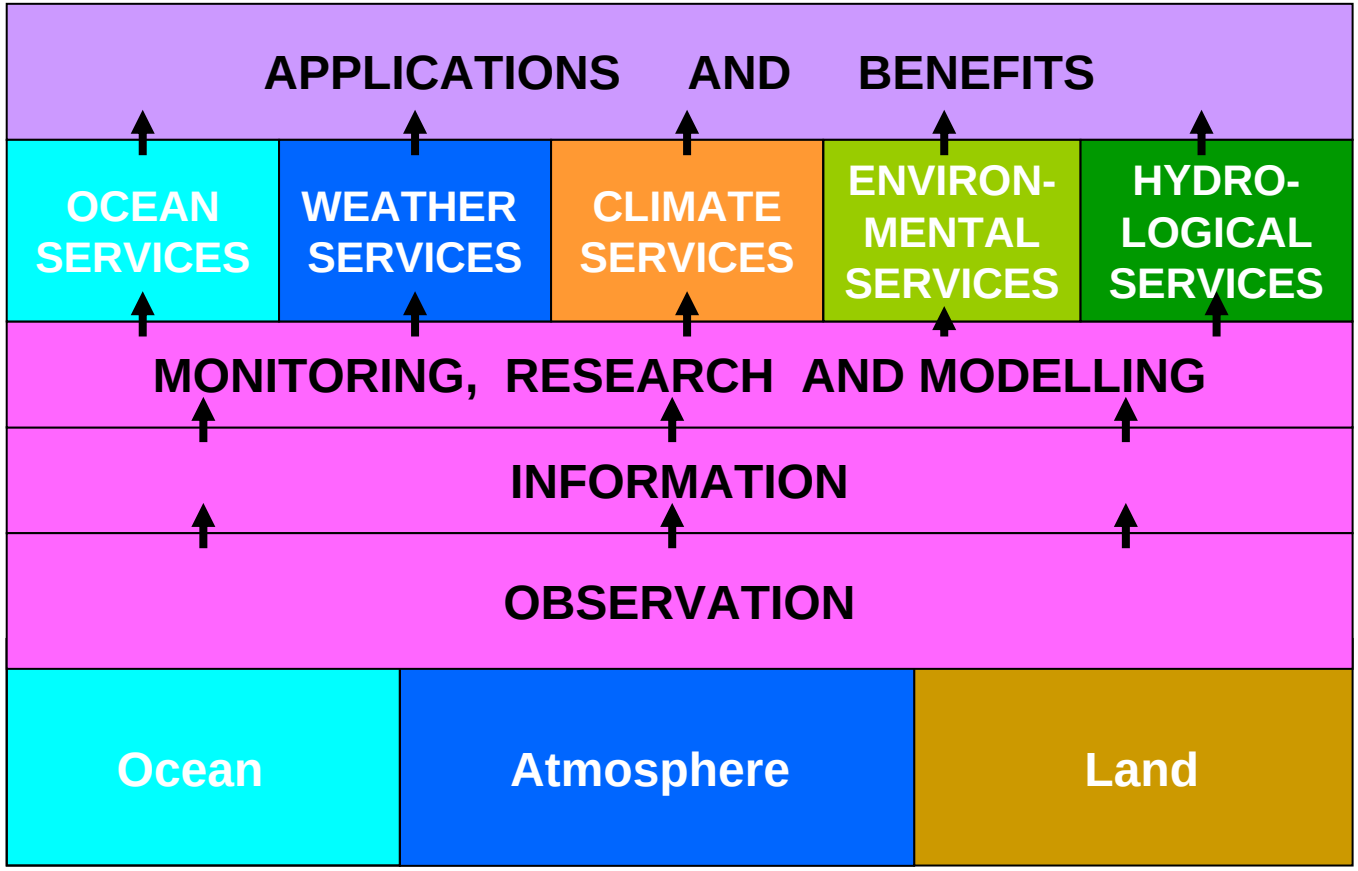
SOME SUGGESTIONS FOR ENHANCING THE VALUE OF MET- OCEAN SERVICES

- Establish user-oriented National Ocean Services (NOSs) in many more maritime countries than presently operate them
- Strengthen the Global Ocean Observing System (GOOS)
- Develop improved ocean prediction models and improved decision-support models and algorithms
- Establish much greater interaction and dialogue between the providers and potential users of met-ocean services
- Initiate a range of pilot projects aimed at demonstrating the value and benefits of met-ocean services
- Put a major effort into building capacity, in both the provider and user communities, for joint initiatives to enhance the quality, utility and value of the various services.

A SEAMLESS NATIONAL SERVICE PROVISION SYSTEM



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SOME THOUGHTS ON WHAT JCOMM COULD DO

- Promote the initiation of a range of case studies of the economic benefits of different categories of met-ocean services in line with the Madrid Action Plan
- Re-emphasise the importance of national contributions to the international ocean observing and data processing infrastructure as a global public good;
- Advocate Members' establishment of government funded operational National Ocean Services (NOSs) providing a range of core public good ocean services;
- Foster economies of scope and scale between the service roles of NMSs and those NOSs and ocean research agencies engaged in the provision of services;
- Offer to assume responsibility, in collaboration with the WMO Commission for Climatology, for advancing the development of ocean climate services as part of the proposed new Global Framework for Climate Services (GFCS).

THANK YOU