



World Meteorological Organization

Weather • Climate • Water

WMO 2012 Survey on the Use of Satellite Data

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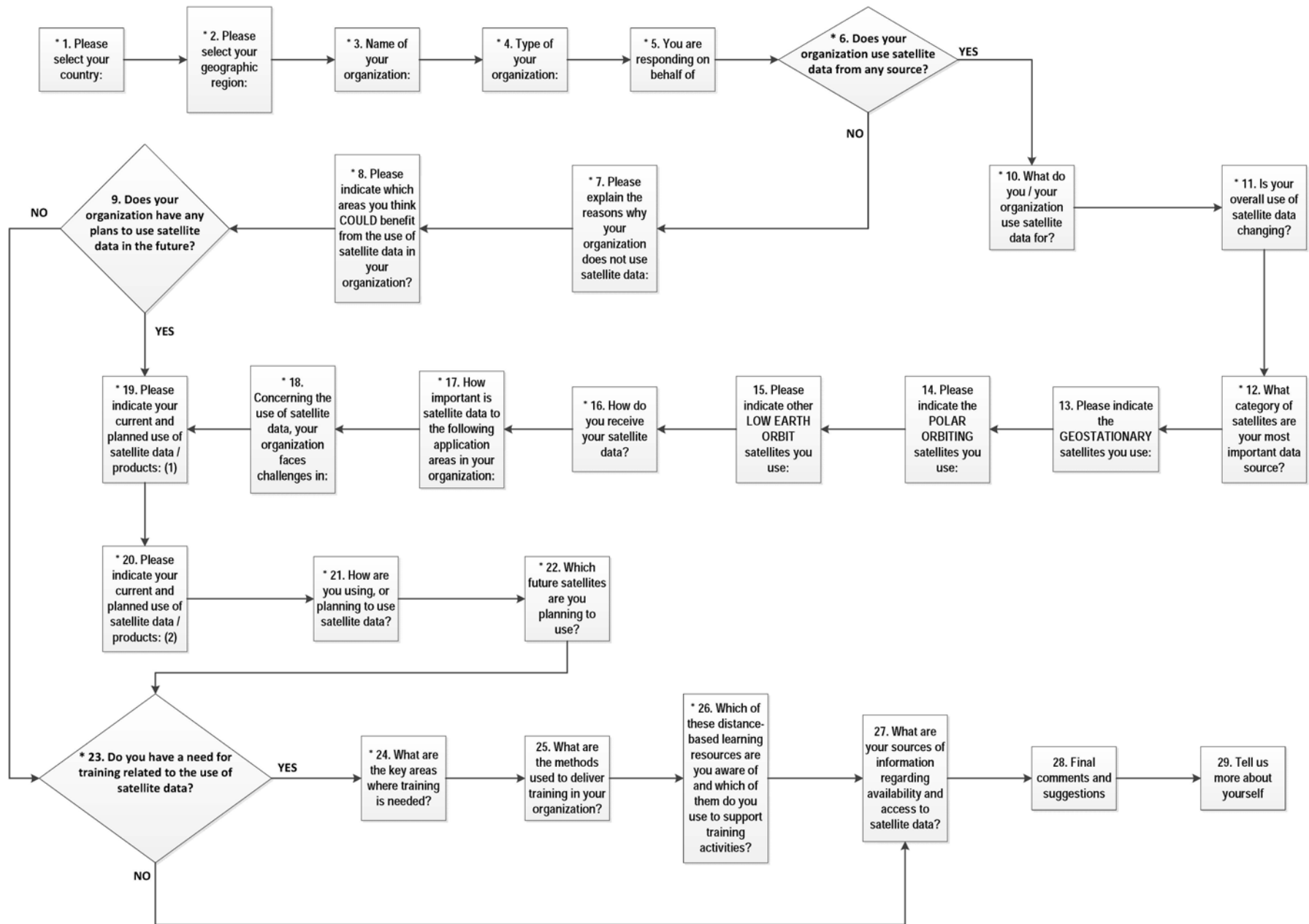
WMO 2012 Survey

- 227 responses from 95 countries
 - Relevance of satellites
 - Relevance of satellite-based products (for weather, climate, water, environmental applications)
 - Data access
 - Training
 - Challenges
 - Satellite information sources
 - Contact details

- Revised questionnaire (w.r.t. predecessors since 1996)
 - Simplified questions (28)
 - Broader audience (PRs; expert teams of WMO and co-sponsored programmes (GCOS, WCRP); International Scientific Working Groups; VLab; GEO)
 - Online, between May and mid-Sept 2012
 - ET-SUP had key role in preparation
 - Intern in WMO SP office helped

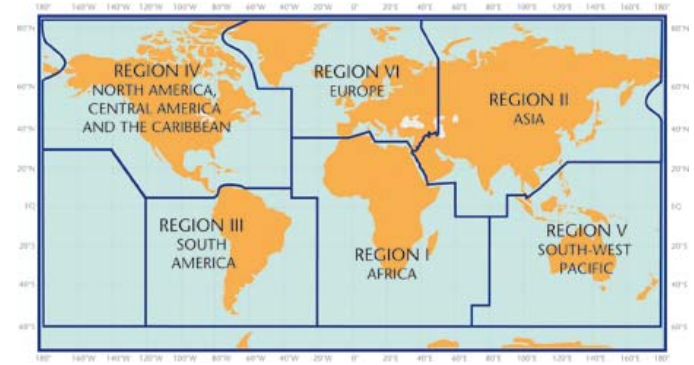


WMO 2012 Survey: Questionnaire



Participation

- Analysis approach:
 - NMHSs and other operational agencies
 - Research and academia
 - (Private sector)
 - (NGOs, others)

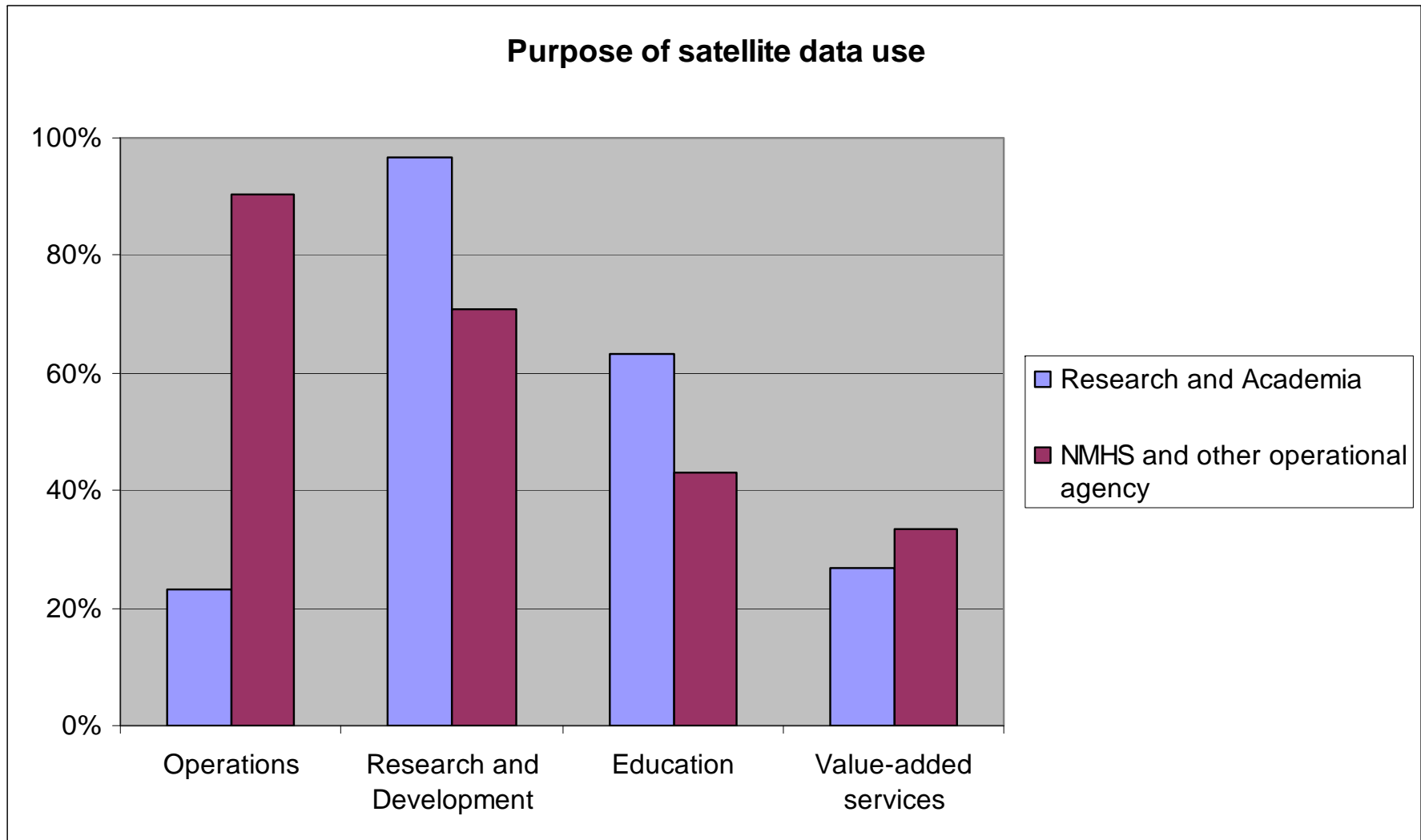


■ **99% of respondents use satellite data!**

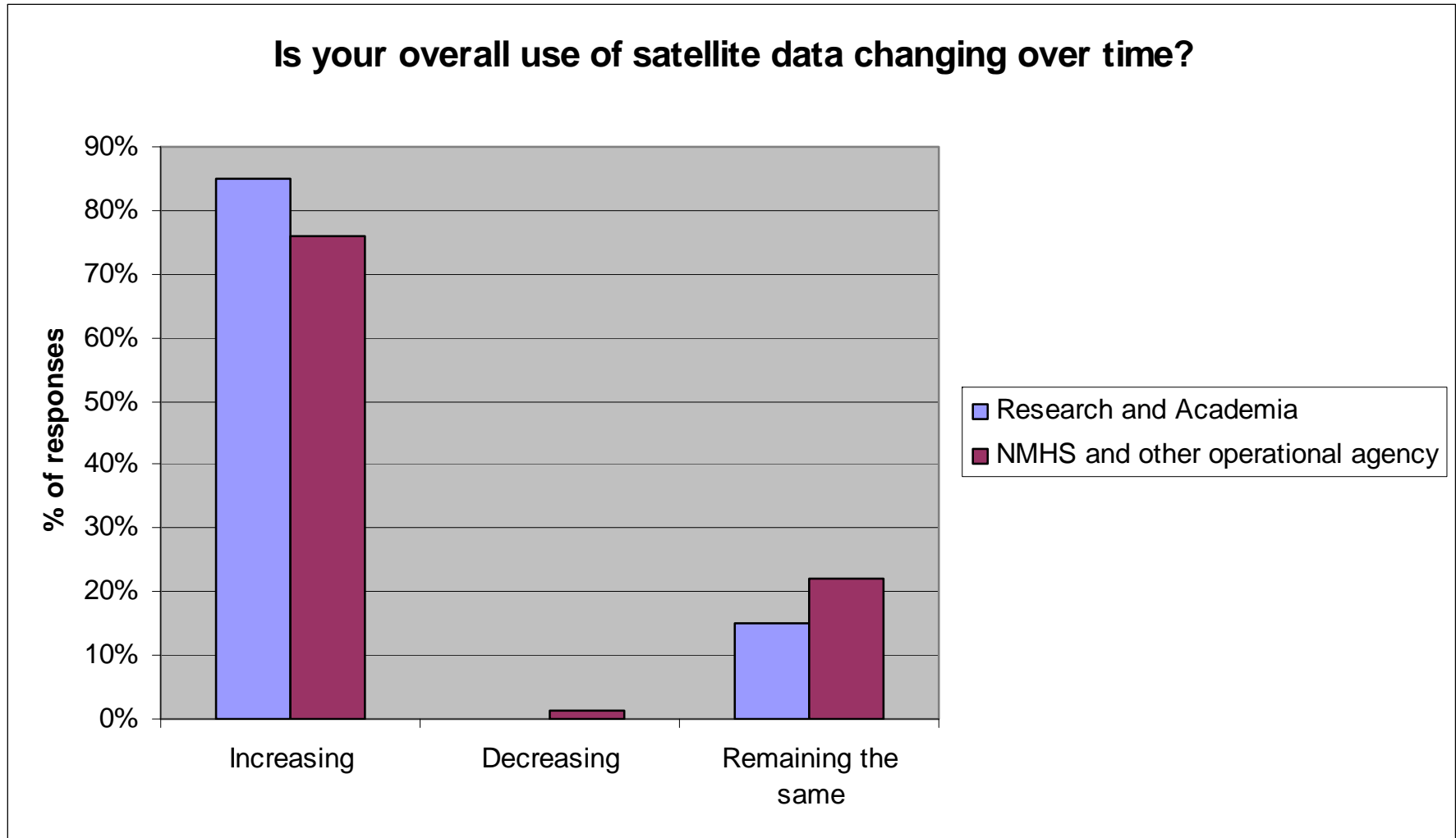
WMO Region	Number of Members	Number of Members with at least one response (rate in %)	NMHS	Other operational agency	Research & Academia	Total number of responses
I (Africa)	56	17 (30%)	21	11	5	37
II (Asia)	35	19 (54%)	25	2	7	34
III (S America)	13	5 (38%)	6	4	4	14
IV (N&C America &C)	26	8 (31%)	14	6	24	44
V (SW Pacific)	22	12 (55%)	15	1	1	17
VI (Europe)	50	34 (68%)	46	7	19	72
All	189	95 (50%)	127	31	60	218



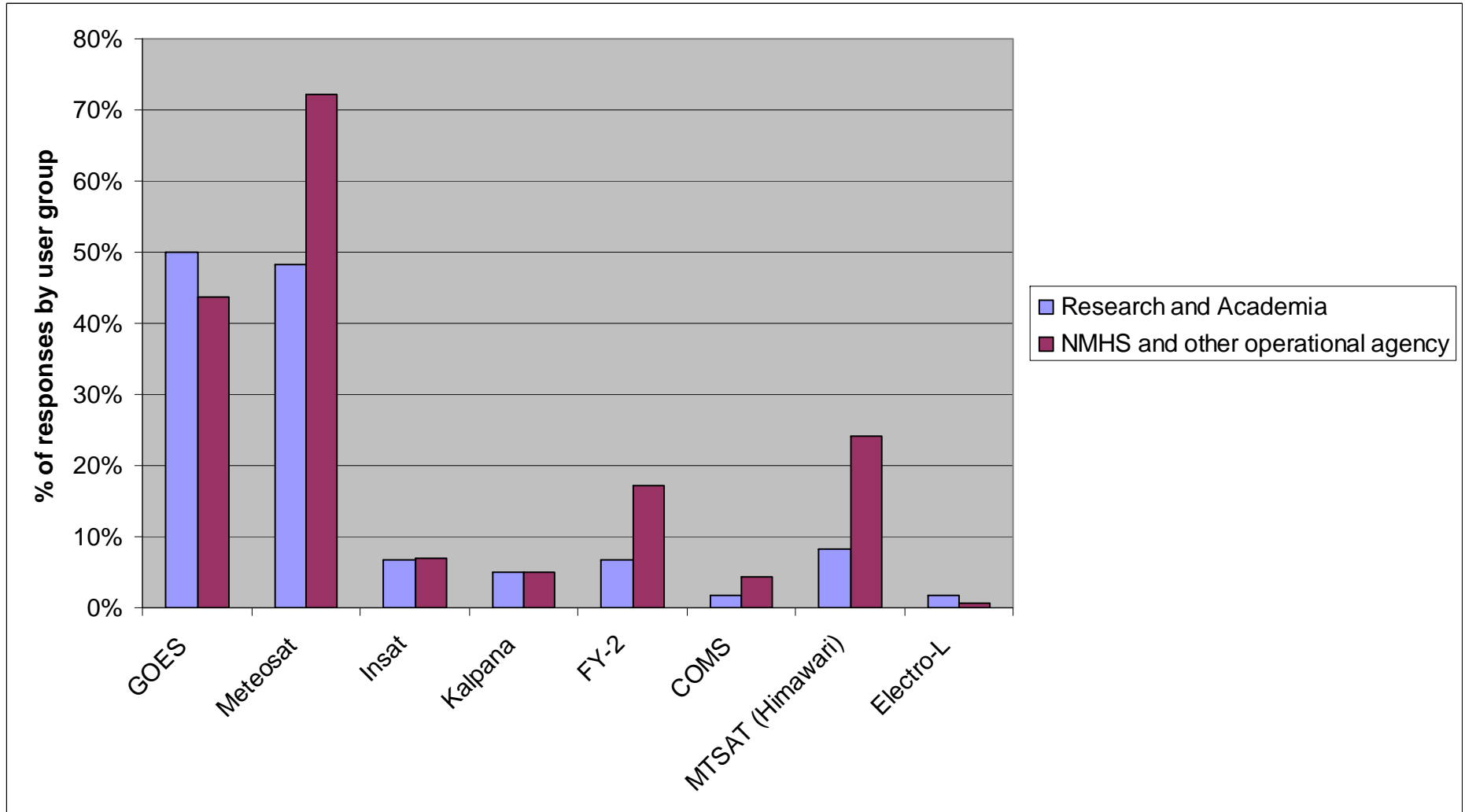
Purpose of satellite data use



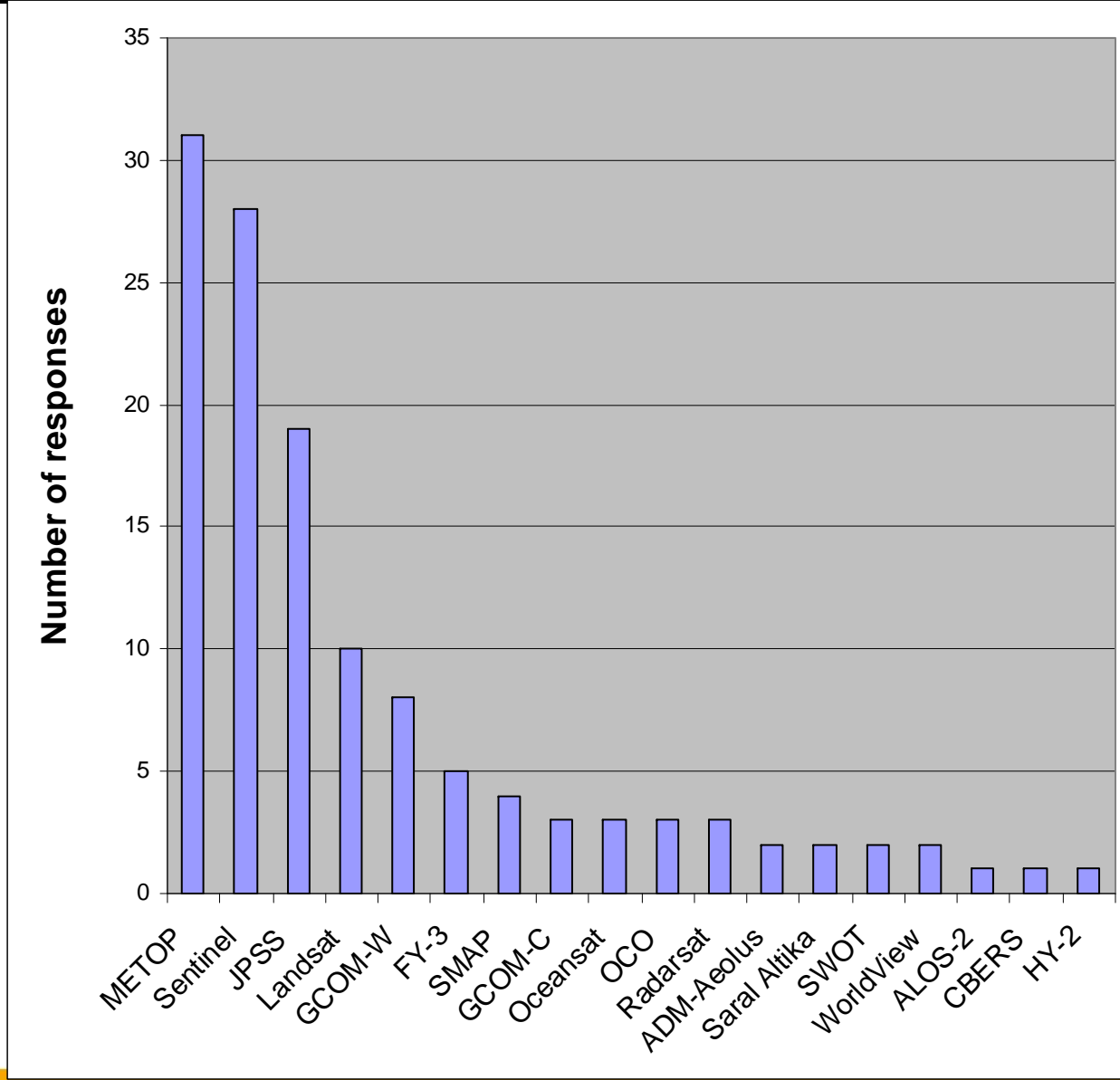
Trends in satellite data use



Use of satellite systems (geostationary)



Planned use of satellite systems (polar-orbiting)

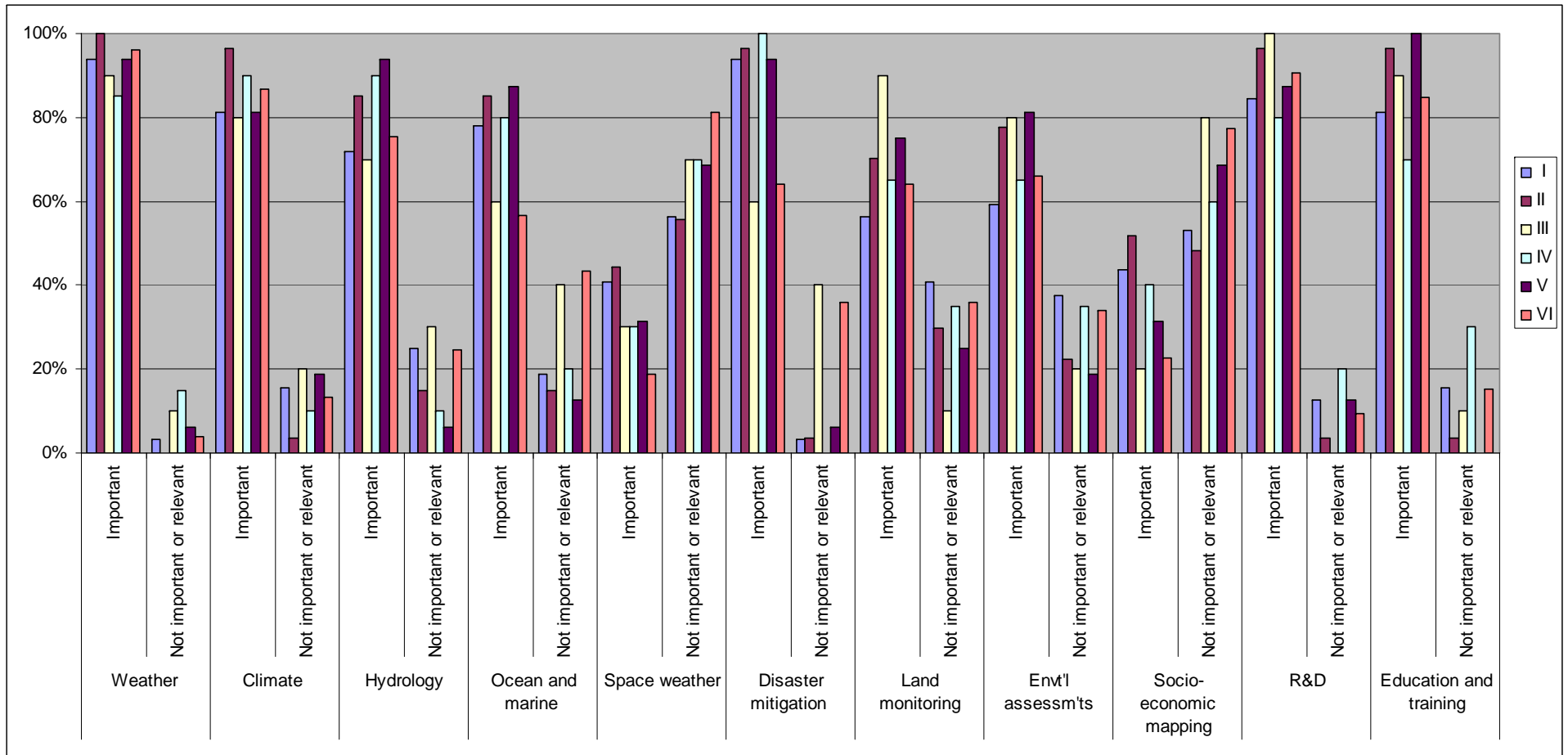


Data access

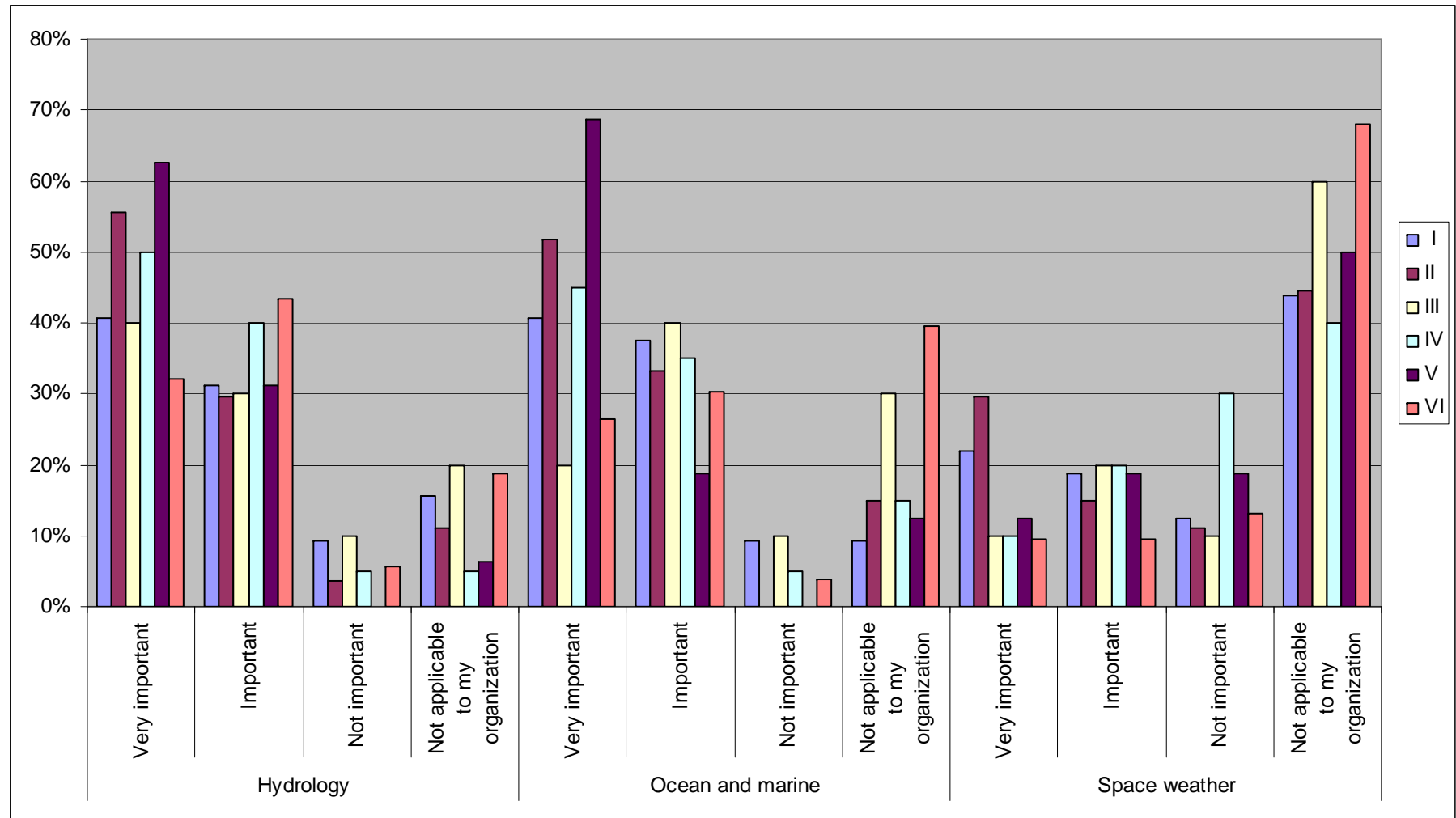
NMHS and other operational agency							
WMO Region	Total responses	Direct readout (e.g., HRPT)	GTS point-to-point network	Internet (ftp, http)	DVB-S / S2 (EUMETCast, CMACast, GEONETCast Americas...)	Mobile services (UMTS, GSM, LTE...)	Other
I	32	10	4	14	18	0	7
II	27	13	6	18	14	0	4
III	10	5	2	8	2	0	1
IV	20	10	3	18	3	0	3
V	16	10	3	15	3	1	1
VI	53	20	9	36	39	0	11
All	158	68	27	109	79	1	27



Importance of satellite data for applications



Importance of satellite data for applications

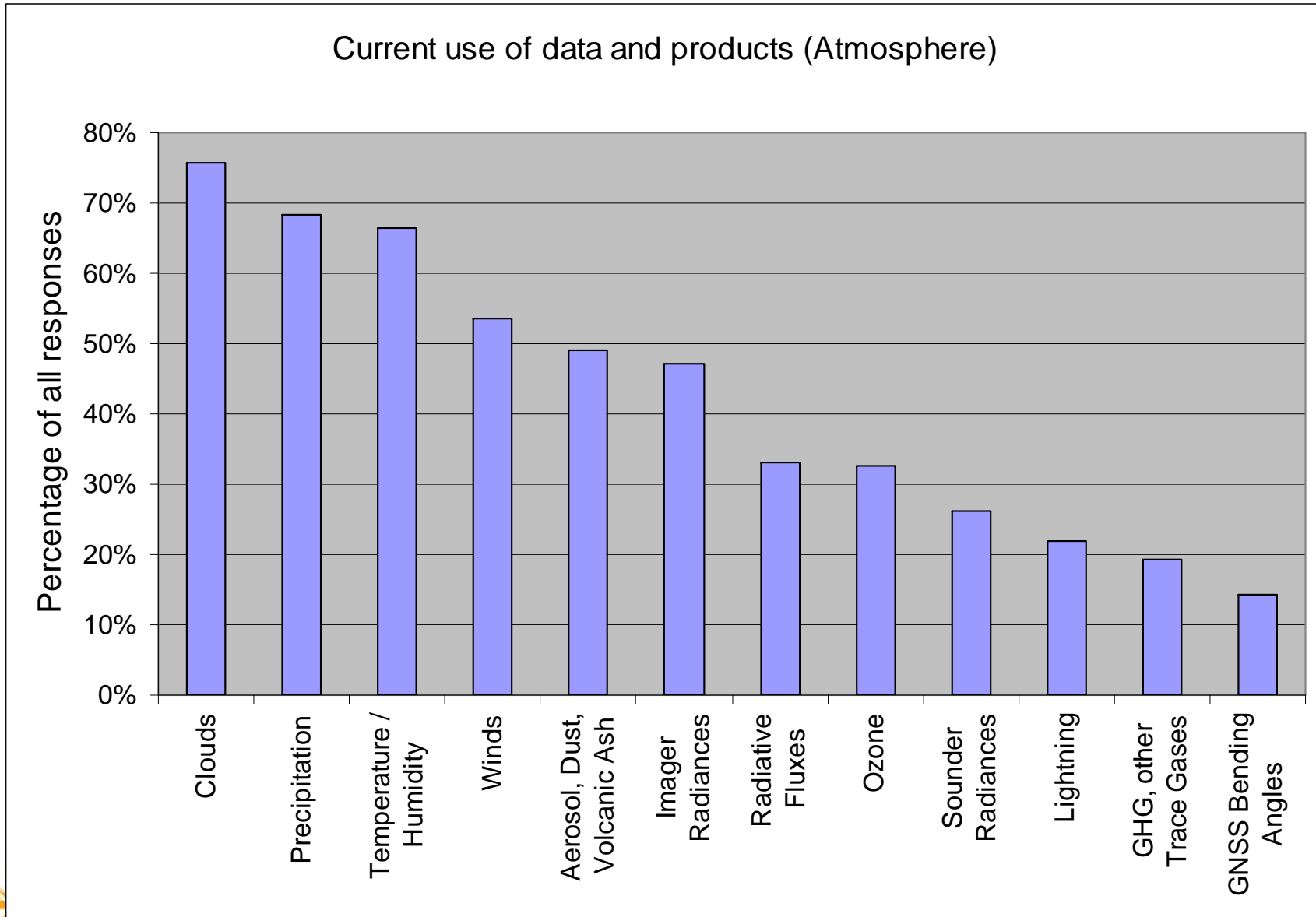


■ National institutional responsibilities

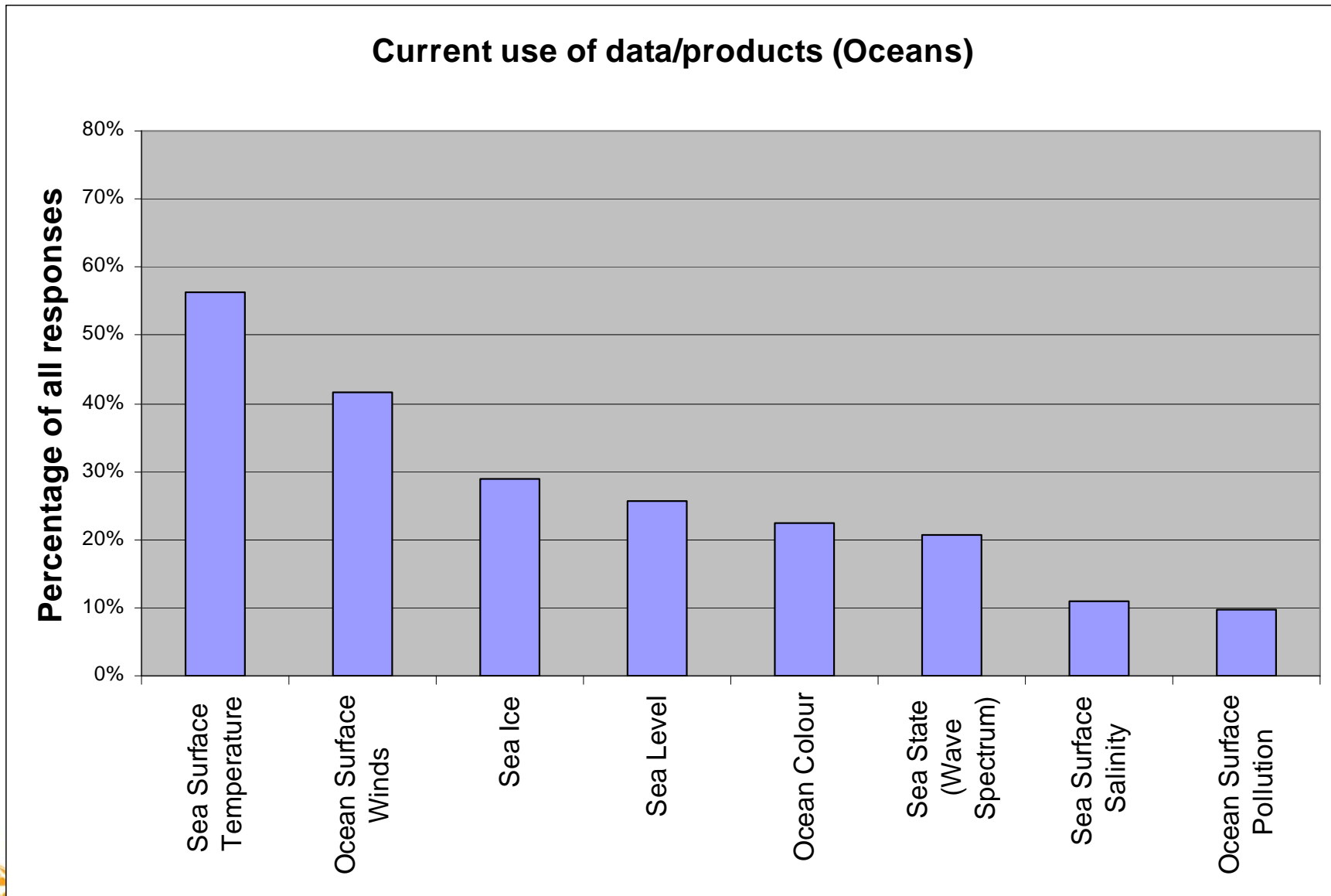
■ Outreach of Survey



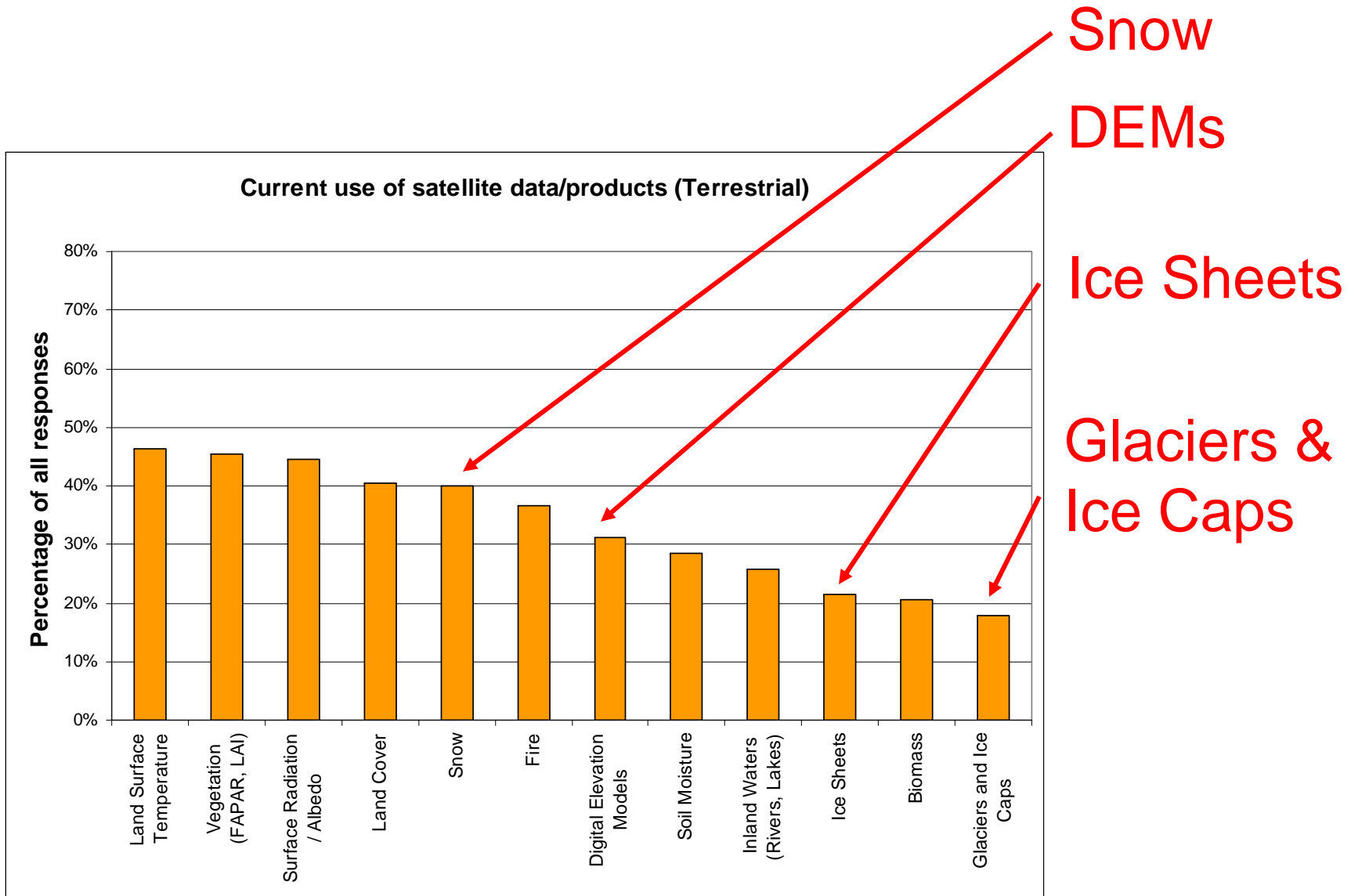
Current use of satellite-based products



Current use of satellite-based products

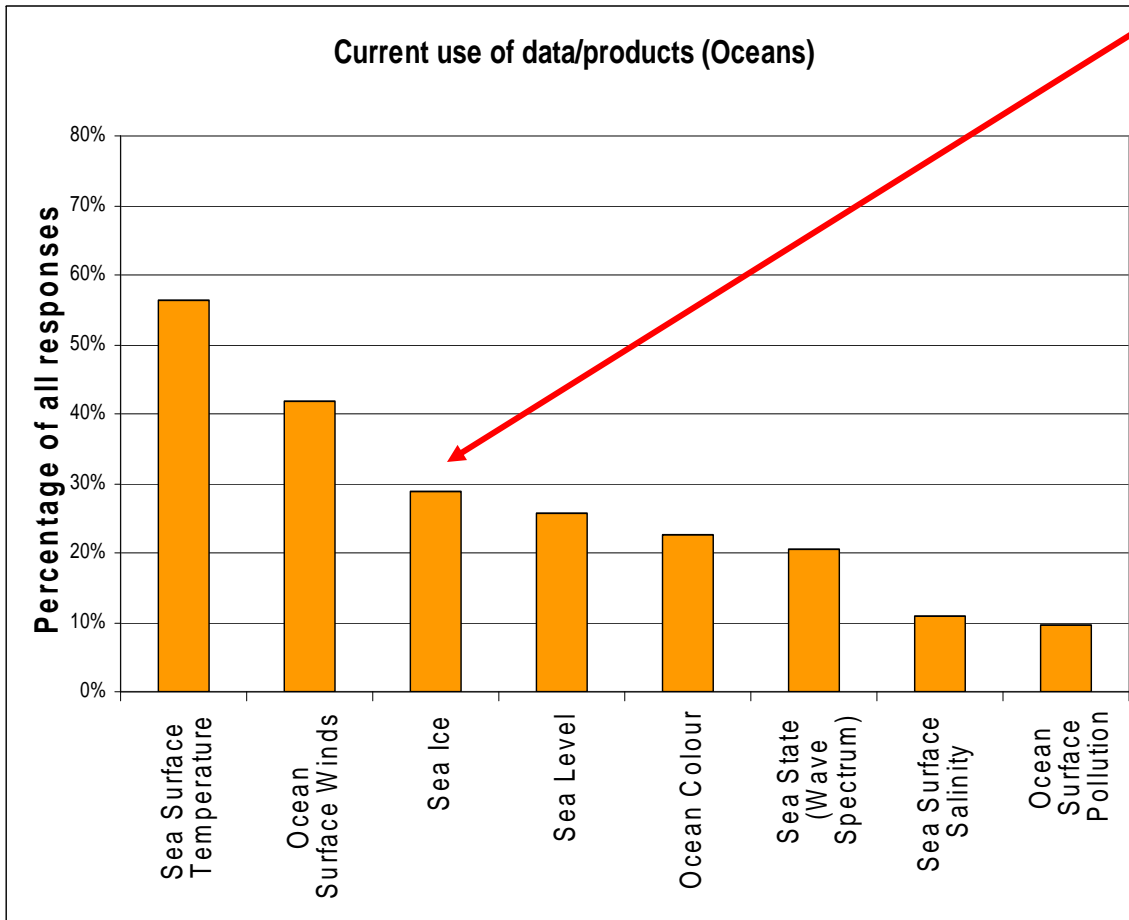


Current use of satellite-based products



Current use of satellite-based products

Sea ice



User categories

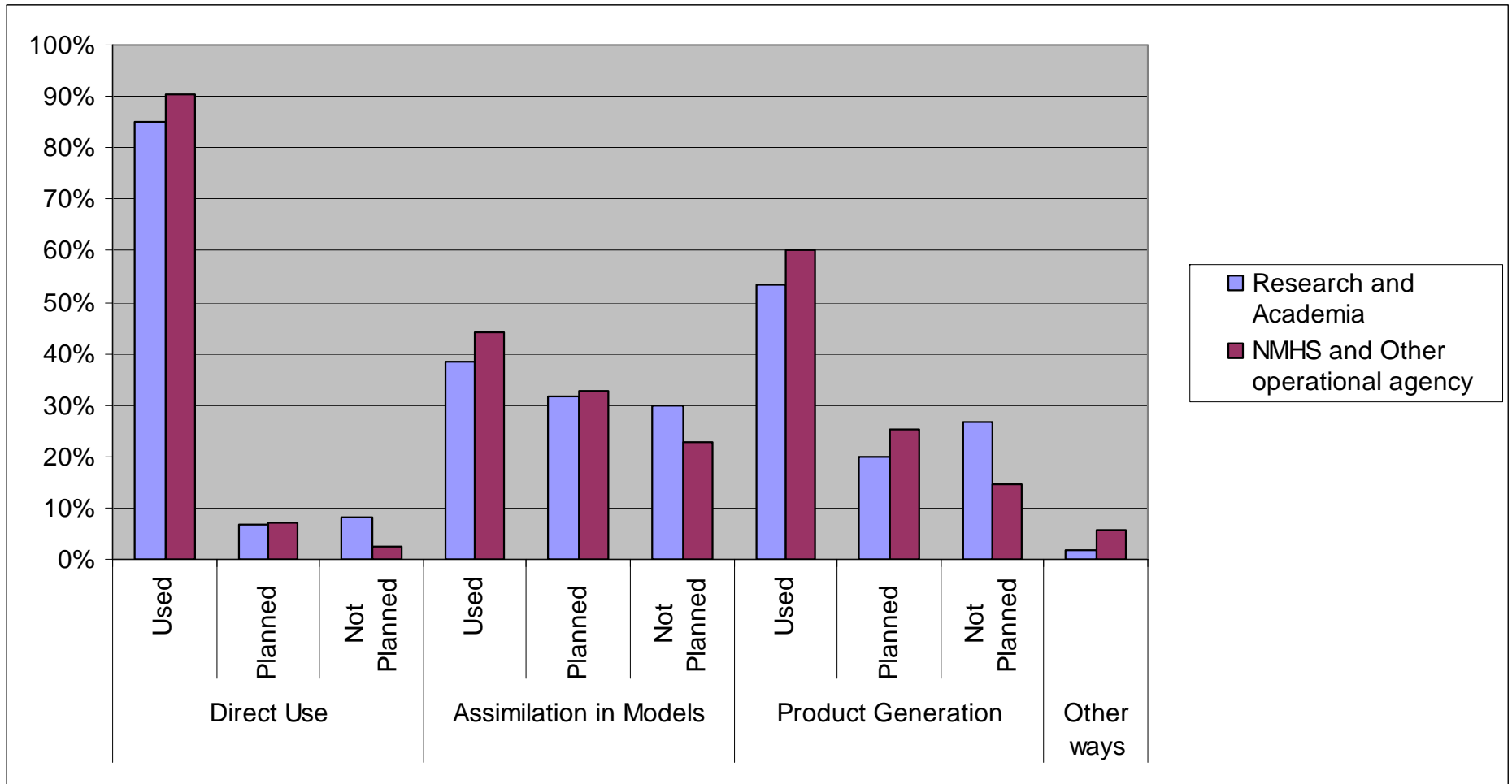
Operations	46 responses
R&D	17 responses

Geographical distribution

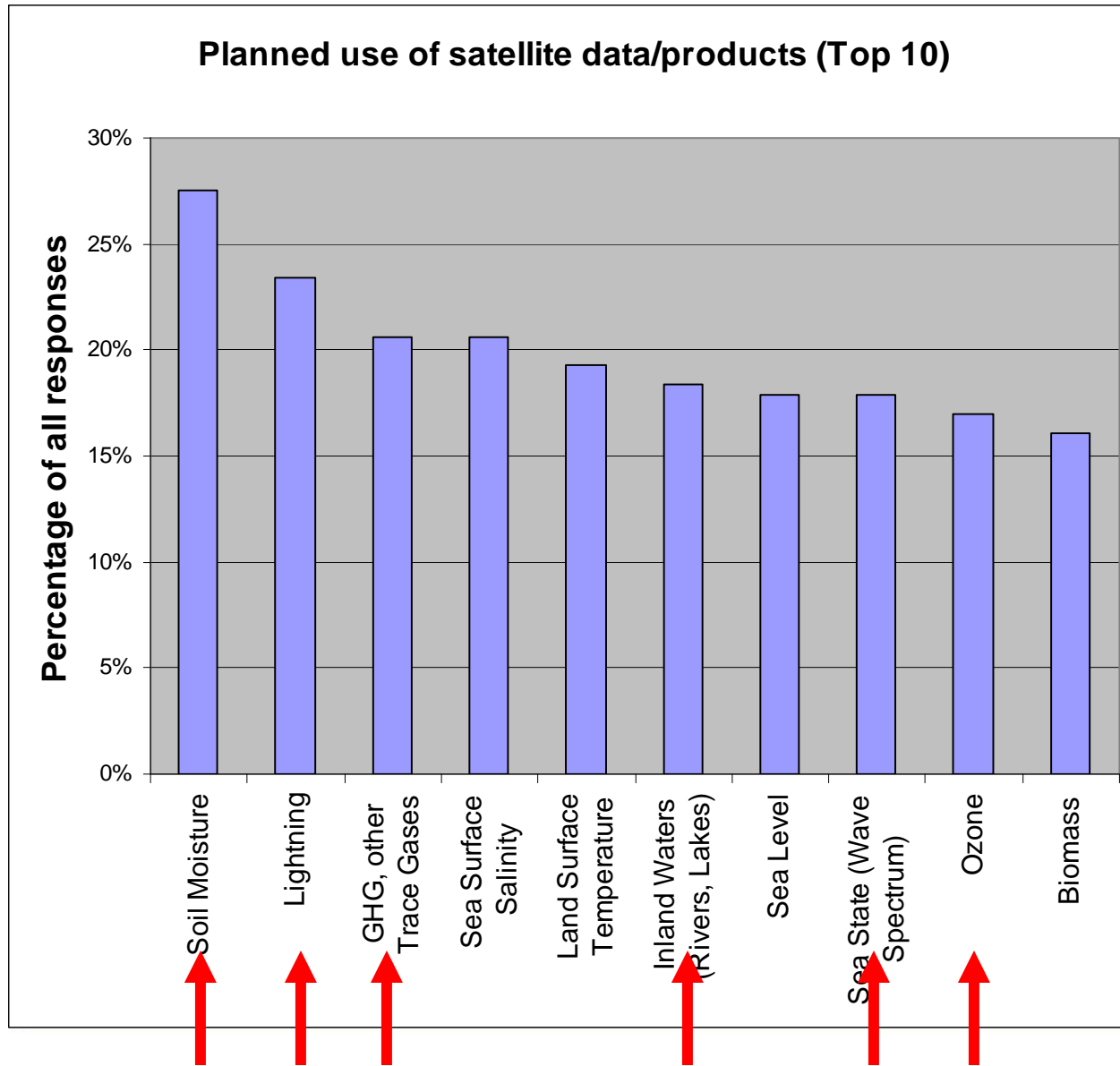
Africa	4
Asia	9
S. America	2
N. America&C	18
SW Pacific	3
Europe	28



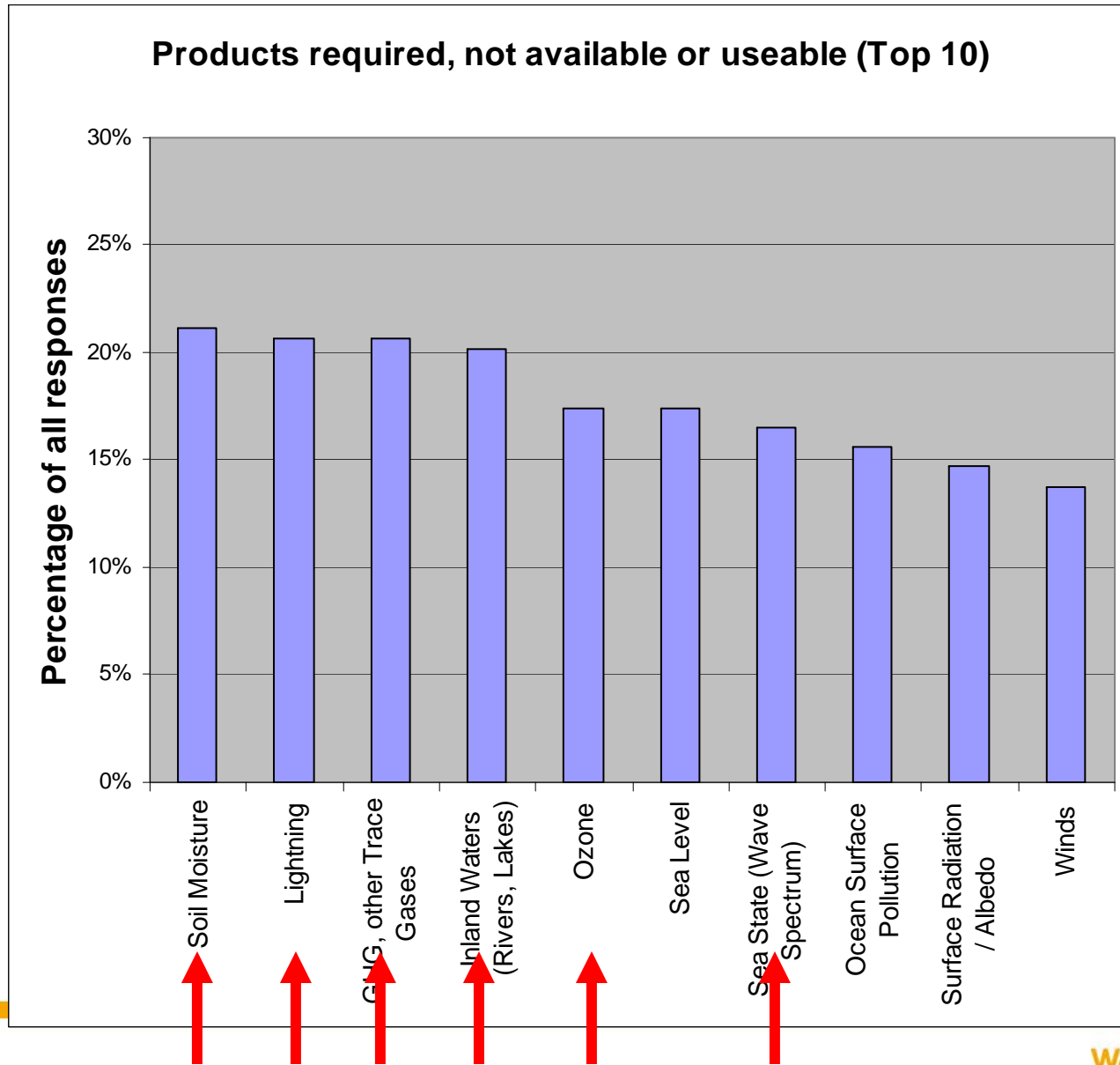
Ways of using satellite data



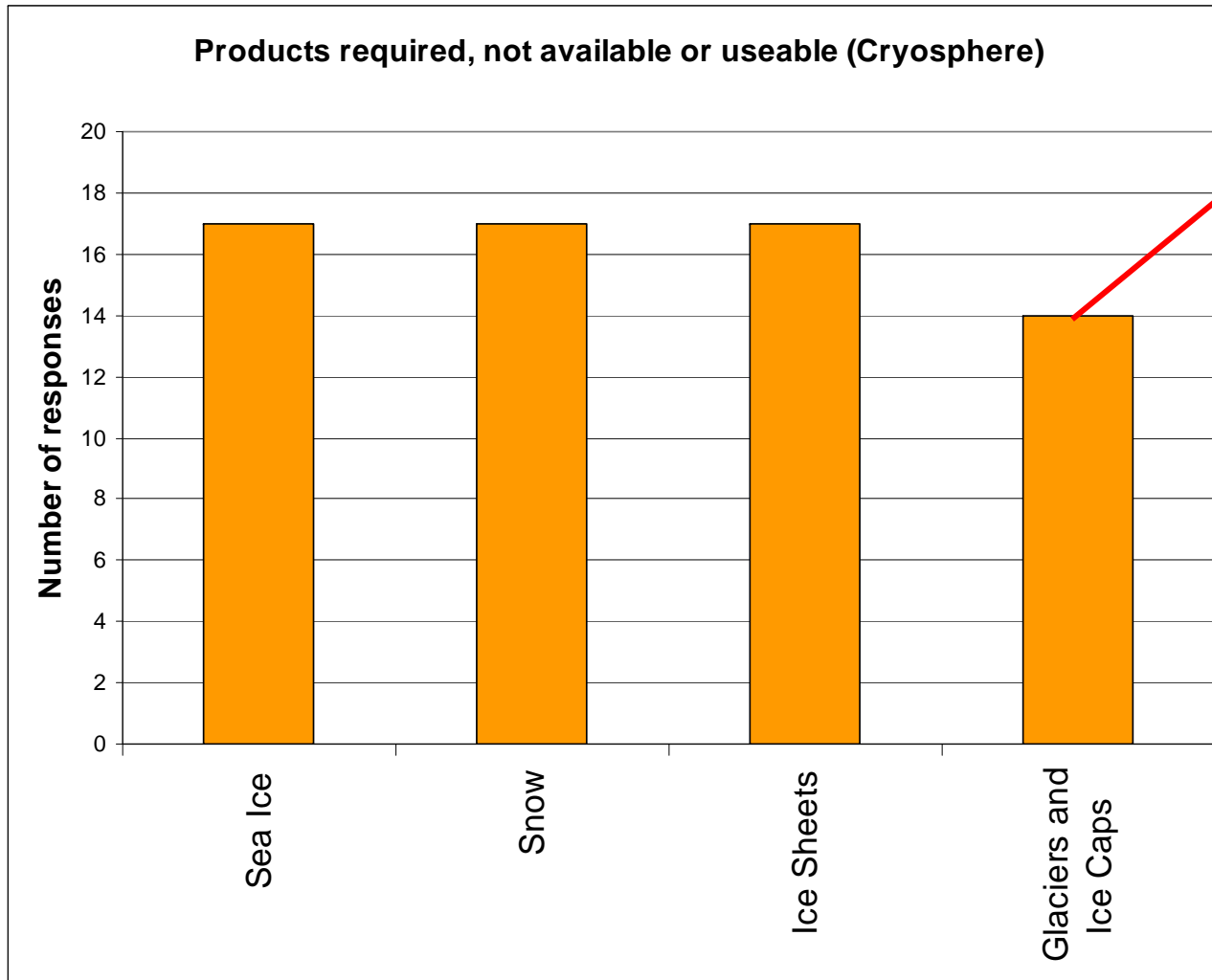
Plans, Deficiencies re satellite-based products



Plans, Deficiencies re satellite-based products



Plans, Deficiencies re satellite-based products

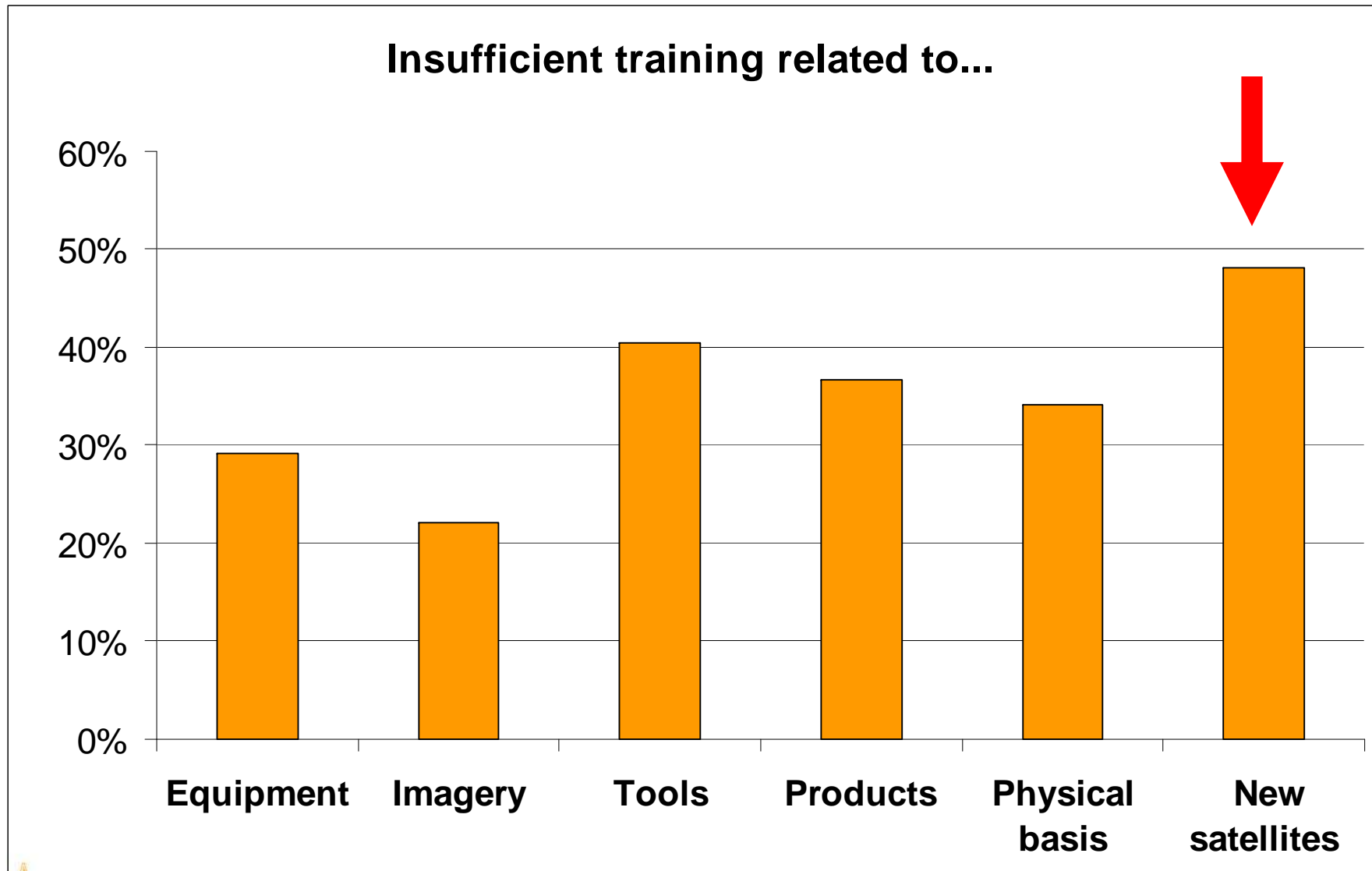


Responses

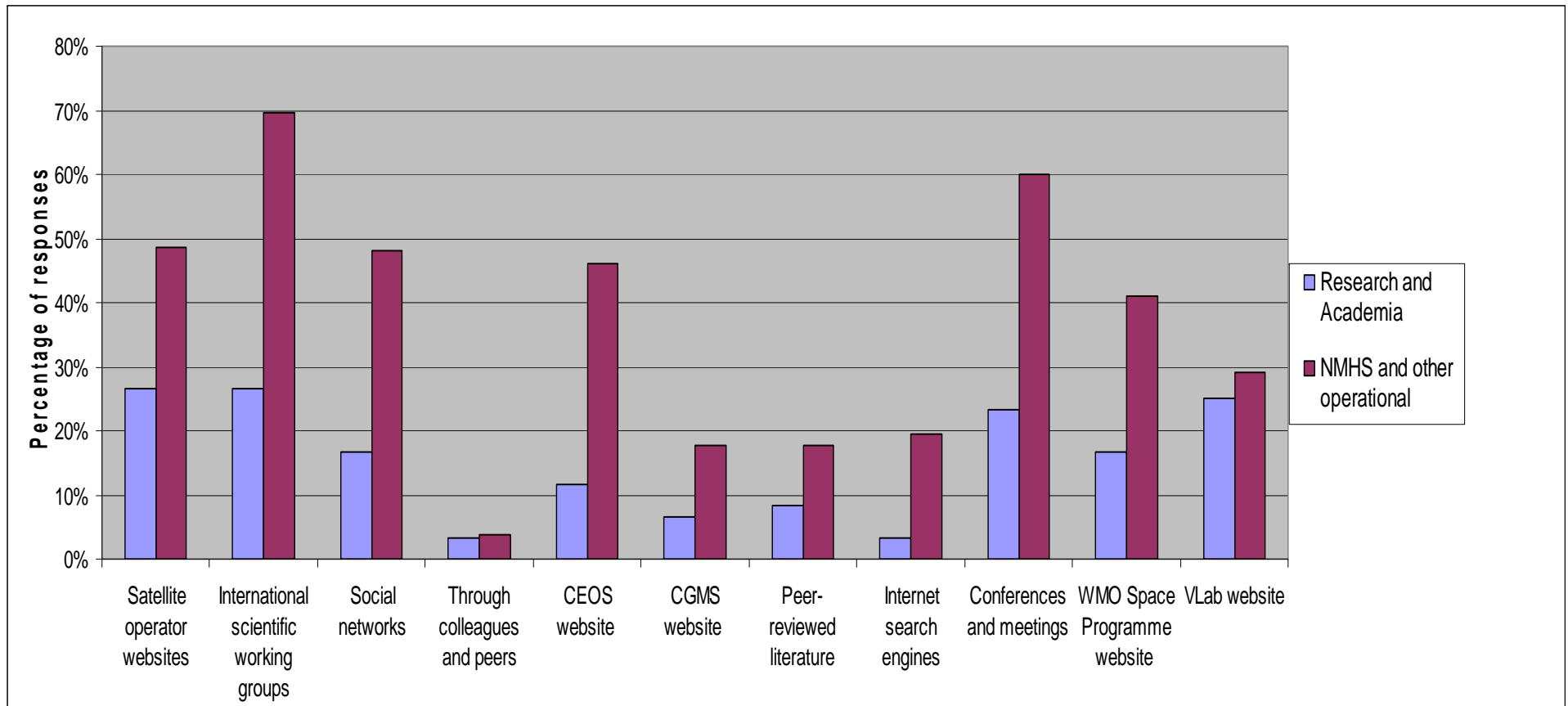
NMS Argentina
NMS Azerbaijan
NMS Bosnia-Herzegovina
NMS Chile
NMS India
NMS Iran (2x)
NMS Kenya
NMS Netherlands
NMS Kuwait
NMSC Rep of Korea
ROSHYDROMET
University of Bristol, UK
NMS Uzbekistan



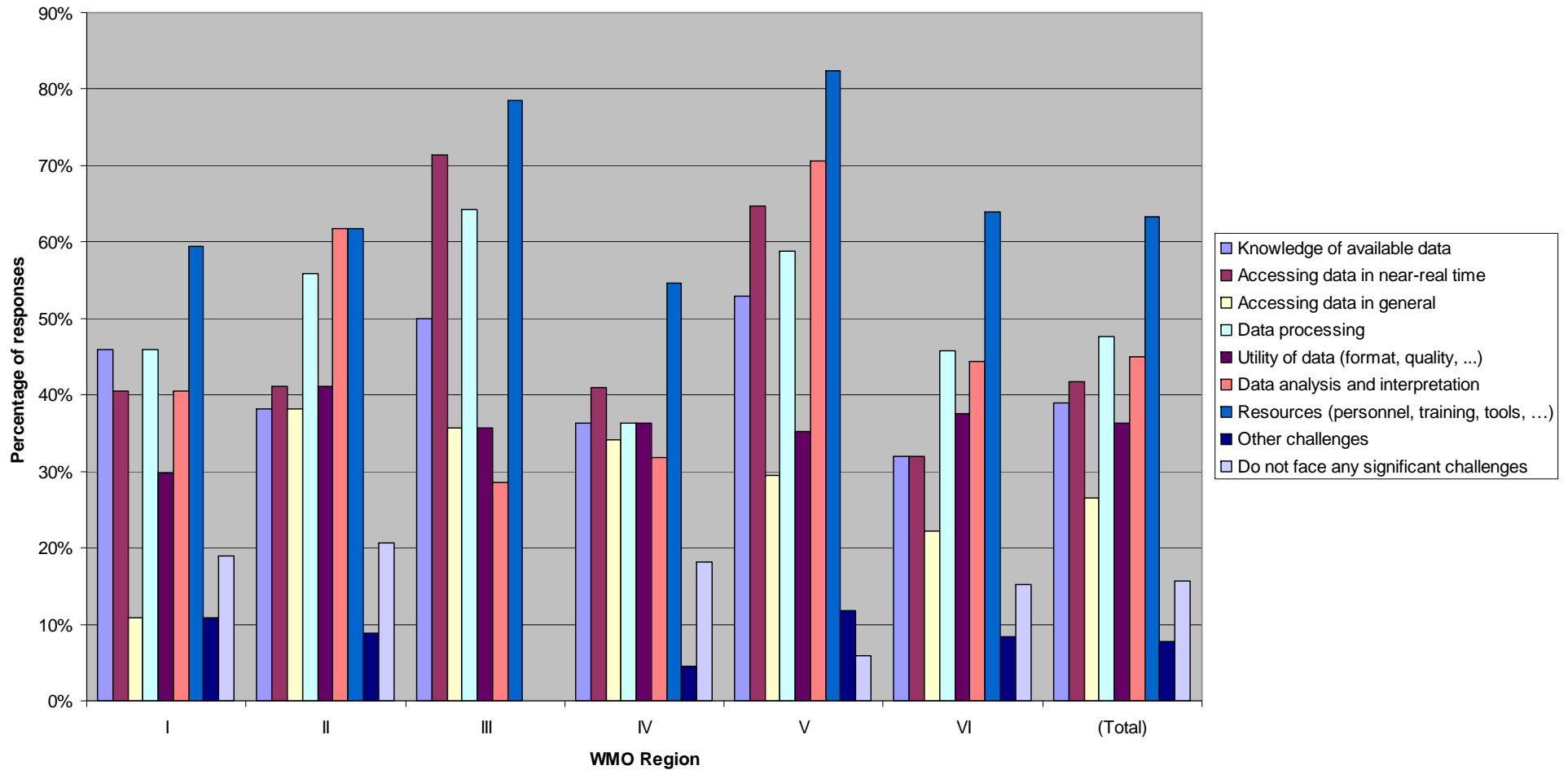
Training needs



Information sources



Challenges



Challenges

- (from Q11 – Overall use of satellite data)
- Lack of expertise for interpreting satellite products, for environmental and resource management (DRC Congo)
- Need for geospatially-located information products (Ethiopia)
- (from Q16 – Data access)
- Direct read-out (HRPT) station currently not working (Kenya)
- (from Q18 – Challenges in using data)
- Real-time access to polar orbiting data a challenge (Mauritius)
- High cost of high-resolution imagery (South Africa)
- (from Q19/Q20 – Planned use, unmet requirements):
- Data extraction in particular grid format needed (Cameroon)
- Land use, settlement, and urban typology information needed (South Africa)
- (from Q24 – Training needs):
- GIS training needed (Kenya)
- Rainfall rate estimation training needed (Kenya)
- Administration of SYNERGIE system and MPEF/SAF product interpretation (Niger)
- (from Q28 – General comments):
- A geostationary satellite based around 70°E would offer optimum coverage of Indian Ocean (for cyclone monitoring, high seas warning, airmass movements) (Mauritius)



Executive Summary

- There is increasing utilization of satellite data in most Member countries responding to the survey
- The increasing relevance of satellite data is recognized for a wide range of applications (nowcasting, aviation, atmospheric composition)
- The importance of satellite data for climate applications is perceived as equally important as for weather applications
- Users increasingly demand high-resolution data and products
- Overall improved access to data, facilitated by data policies and the enhanced role of the internet as a data dissemination mechanism
- More guidance needed on data and product attributes (e.g., quality indicators)
- Growing recognition of the sometimes unique value of satellites, e.g., for ocean monitoring, for meteorological and Earth system research, for spatial mapping, and in data-sparse areas such as small-island states and polar regions
- The key relevance of data from research/demonstration missions for operational purposes has been confirmed
- Satellite data formats should be harmonized and simplified, for platform-independent use
- With exceptions, most users are insufficiently prepared for the new generation of operational satellites planned for 2014-2020
- Targeted and continuous training is required to build and maintain human capacity



Conclusions in the Report

- In the future, surveys on the use of satellite data should be conducted regionally on a biennial basis, using the questionnaire used in the 2012 WMO survey as a model; such surveys should be led by regional mechanisms to identify and document user requirements for satellite data and products (e.g., RA II Pilot Project; Regional Coordination Groups for Satellite Data Requirements in RA III/IV)
- Targeted surveying of focus groups and individuals (e.g., through interviews) should be considered to address problems identified in broad surveys
- Global surveys led by WMO should be conducted less frequently, i.e. on a 3-5 year basis (N.B.: the work programme of CBS is organized in 4-year cycles)



Conclusions in the Report

- Additional effort should go into reaching out to a broader range of satellite data users in all GEO Societal Benefit Areas; partnering with other international organization should be considered to achieve this
- Online techniques should be employed for conducting surveys
- Statistics are important; qualitative analyses are equally important; they enable identifying individual “cries for help” by users
- Work plans to take remedial action based on surveys should be developed; the WMO Expert Team on Satellite Utilization and Products should take a key role.



Summary

- Large information resource
 - For ET-SUP to act upon tactically...
 - Addressing individual challenges
 - ... and strategically:
 - Use statistics to review overall activities of Team / WMO
 - Global vs Region-based surveys?
 - Lessons learned? Future surveys? Resources?
- Discussion / break-out session recommended





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Thank you for your attention

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www.wmo.int/sat