

Chapter	From Page	From Line	To Page	To Line	Comments	
1	24	16	24	22	<p>We will also need an Open Spatial Standards based data exchange model for Climate data that is designed for systems and services interoperability. This model would sit between databases and future services and provide context to climate data. Individual organisations would map their data in their databases to the data exchange model providing future climate services with a consistent view of Climate data. The Bureau maintains a wide range of Climate Data that is used both internally as well as by a wide range of stakeholders including: Industry, Academia; Government; Research and the General Public.</p> <p>There is increasing demand for an authoritative source of Climate data. The Bureau is ideally placed to fulfil this demand in Australia. It is probable that with the advent of the Global Framework for Climate Services that the Bureau will be required to share its data internationally via interoperable services via the Internet.</p> <p>As it is unlikely that all countries will use the same technology, database software and data models to store their Climate data, it is expected that such Climate services will require a robust community agreed data exchange model to facilitate interoperable Climate Services.</p> <p>The Bureau is investing in the development of similar interoperable data exchange models, particularly WaterML 2.0 and Water Data Transfer Format.</p> <p>The work to develop a Climate Data exchange model will be undertaken via:</p> <ul style="list-style-type: none"> <li>• The OGC MetOceans Domain Working Group (Meteo.DWG). All interested parties will be invited to contribute via Meteo.DWG. This work will mainly be via teleconference and email with several face to face meetings at OGC Technical Conference meetings. SRCC (Bruce Bannerman) is a Co-Chair of the Meteo.DWG Working Group handling data modelling issues;</li> <li>• An OGC Interoperability Project dedicated to Climate Data (CCIP-2). This project will be used to validate the Meteo.DWG data modelling work undertaken during 2011. It is intended that the 2011 CCIP-2 project will aim to have a number of countries serve and integrate their</li> </ul>	<p>Kevin Smith a/SRCE Senior Climatologist National Climate Centre Bureau of Meteorology Ph: +61 3 96694079 PO Box 1289 Melbourne, Fax:+61 3 96694760 Victoria 3001. Mobile: 0421022316 Australia. <a href="http://www.bom.gov.au">http://www.bom.gov.au</a> <a href="mailto:k.c.smith@bom.gov.au">k.c.smith@bom.gov.au</a> <a href="mailto:GCOS_Lead_Centre_RAV@bom.gov.au">GCOS Lead Centre RAV@bom.gov.au</a></p>

					<p>High Quality Climate Networks via Open Spatial Standards Services. Vendors and Project Participants will collaborate via email and teleconferences to ensure that Climate Data can be served and consumed. A conference will be held in Boston in September 2011 to demonstrate and discuss the 2011 results. The OGC will manage this project. SRCC is on the steering committee of this project. It is anticipated that the work required to develop a community agreed model for exchanging Climate Data will get a head start by evaluating and then adopting work that has already occurred within this field globally.</p> <p>The work to be undertaken during this project's activities is required to ensure that a 'robust' and 'well tested' and community agreed' Climate data exchange model is available for future Bureau Climate Services that will in turn comprise part of a Global Framework of Climate Services. This project's work will also ensure that the Climate Data exchange format is well supported by spatial vendors.</p>	
1	3	1	3	10	<p>We are talking about integrated modelling which is useful but I don't feel the examples are quite right. Perhaps if we broadened the examples to examine the impacts of the El Nino phenomenon on the physical climate and in turn how this impacts on ecosystems and human systems? And similarly for climate change we could speak of the complex feedbacks between the socio-economic response to climate change (need for ongoing development and millenium development goals versus need to mitigate and a low-carbon economy) and the impact on the physical changes resulting from climate change (perhaps using the SRES scenarios)</p>	Kevin Smith Australia
1	4	9	4	9	<p>Could also mention extension officer types...people who extend the climate information to answer the questions of their stakeholders. Or this could possibly come under management</p>	Kevin Smith Australia
1	5	32	5	33	<p>Missing one element here. Change this sentence to " Three important elements of risk management are the use of history as a guide, early warning sytems and insurance tools. All are highly dependent on climate information. The historical climate record, the climatology and the variability can tell us much about managing risk. For instance, that history suggests one in five years experience annual rainfall below</p>	Kevin Smith Australia

					300mm could reflect a threshold for a successful wheat crop. This information can be used to plan a business operation. Early warning sytems....	
1	10	37	10	37	...from extensive real-time in situ and remotely sensed observations....	Kevin Smith Australia
1	11	7	11	7	...on the intraseasonal to inter-annual scales...	Kevin Smith Australia
1	13	26	13	27	Futhermore, it is not sensible to use current seasonal forecasting models to provide definitive, high-likelihood predictions such as "above average temperatures are expected next summer". Instead a more scientifically robust solution is to provide probabalistic outlooks....	Kevin Smith Australia
1	17	12	17	12	Insert the following after "climate data." Whilst valuable and opportunistic, the priorities for climate stations and weather stations sometimes differ. Climate information depends on long term stable records of data free from inhomogeneities and well sited to ensure intercomparability. Many of these factors are not as critical to inform weather forecasting needs.	Kevin Smith Australia
1	18	7	18	7	insert "and well documented" before "quality control methods".	Kevin Smith Australia
1	6	34	6	34	This section describes 'climate information' as information used to plan day-to-day activities. It may be more appropriate to use the term 'weather' in this instance as the report defines 'climate' as representing time periods of months or longer.	Kevin Smith Australia
1	14	8			Missing Figure B1.5	Kevin Smith Australia
1	19	15	19	15	El Nino missing ~ over n	Kevin Smith Australia
1	9	41	9	41	after hot or cold spell, add " onset or withdrawal of the monsoons are" on the way	Andre Kamga Foamouhoue African Centre for Meteorological Applications for Development P.O.Box 13184 85, Avenue des Ministeres Tel: +227 20 73 49 92 / + 227 90 29 52 92 Fax: + 227 20 72 36 27

1	10	17	10	17	add "today" at the end of the sentence	Andre Kamga Foamouhoue
1	3	4	3	4	add "chemical" to get physical-chemical-biological-social system	Andre Kamga Foamouhoue
1	5	8	5	8	delete "of the"	Andre Kamga Foamouhoue
1	4	3	4	3	prediction and "projection" products	Elisabeth Koch Head of section climatology Division customer service ZAMG Central Institute for Meteorology and Geodynamics Hohe Warte 38 Vienna 1190 Austria 0043 1 36026 2201 0043 664 88414965 0043 36026 elisabeth.koch@zamg.ac.at
1	4	7	4	7	climate impacts 4th type of information?	Elisabeth Koch Austria
1	7	1			researchers are part of "uses by the public"?	Elisabeth Koch Austria
1	9	20	9	20	add "climate projections" as they are different to climate predictions	Elisabeth Koch Austria
1	0				The availability and relevance of traditional (indigenous) knowledge to climate services is not sufficiently discussed in this Chapter.	David Grimes Assistant Deputy Minister Meteorological Service of Canada Environment Canada 141 Laurier Avenue West Ottawa K1P 5J3 Canada 613-943-5585 david.grimes@ec.gc.ca Canada
1	0				The value of a Global Climate Services Framework is that it can serve as a guide or metric against which the supporting programs can gauge their activities, priorities and effectiveness. As such a Framework more focused on the structural relationships between supporting elements	David Grimes Canada

					and information integration and dissemination is most helpful.	
1	0				Chapter 1 is a long narrative that eventually covers all the elements required to support and sustain a Climate Services, with varying degrees of evaluation of the sufficiency or adequacy of the elements for Climate Service. It is recommended that the front end of the document be more concise and that the evaluative-type information be included later in the document.	David Grimes Canada
1	0				The necessity of the Climate Service existing in tandem with a climate science and observations activity should be more explicitly noted in Chapter 1.	David Grimes Canada
1	2	16	2	16	The term "both modern and indigenous sources" implies that indigenous knowledge sources cannot also be modern. Suggest that "scientific and traditional or indigenous sources" would be a better alternative.	David Grimes Canada
1	2	17	2	17	Suggest changing "organizing agricultural activities" to "organizing agricultural and food gathering activities".	David Grimes Canada
1	2	20	20		Suggest changing "Agriculturalists" to "Agriculturalists and traditional hunters/gathers".	David Grimes Canada
1	2		2		Section 1.1 does not sufficiently address the concept of adaptation. There are two responses to climate change: mitigation and adaptation. Climate Services is critical to adaptation and that should be acknowledged more explicitly as a driver for Climate Services. Section 1.1 does not sufficiently address the concept of adaptation. There are two responses to climate change: mitigation and adaptation. Climate Services is critical to adaptation and that should be acknowledged more explicitly as a driver for Climate Services.	David Grimes Canada
1	6	40	6	41	The meaning of this sentence is not clear. Is it suggesting that climate datasets are more meaningful for educational purposes than other purposes? Suggest clarifying and combining with subsequent paragraph.	David Grimes Canada
1	6	40	6	40	What does "richness of its climate" mean?	David Grimes Canada
1	8	22	8	24	It is recommended the Framework avoid the use of subjective evaluations of the state of science. This statement implies that the science of climate prediction is "new". Without more rigorous context	David Grimes Canada

					this is not helpful to informing Climate Services clients about uncertainties or confidence in the current scientific understanding.	
1	8	28	9	4	Box 1.3: The terms Outlook, Prediction and Projection should also be included in the body of the Glossary. The definition of "Forecast" that appears here should also be made consistent with the one in the Glossary.	David Grimes Canada
1	9	1	9	2	Under the "Prediction" definition, recommend revising "over a range of about a month to a year ahead" to "over a range of about a month to perhaps as long as a decade ahead" since there is almost certainly some dependence of climatic conditions on initial state over time scales from a year to a decade (the extent and usefulness of this potential predictability are still being investigated).	David Grimes Canada
1	9	7	9	7	Suggest stating "regions of the oceans" rather than stating that oceans as a whole can be anomalously warm or cold.	David Grimes Canada
1	10	17	10	23	This paragraph is out of date relative to scientific advancements. Deterministic climate prediction is now carried out on decadal scales with some success. See for example, Smith et al., Science, Vol. 317. no. 5839, pp. 796 - 799, 2007.	David Grimes Canada
1	10	17	10	19	Suggest revising "Beyond a year or so, neither weather nor seasonal climate predictions are possible. Nevertheless it is possible to use climate models to make projections of the effects of changing... eruptions." to "The utility of climate predictions beyond a year or so is likely to be relatively small. However, such predictions may still have some societal and economic value and the feasibility of climate predictions out to a decade or longer is currently an active area of research. Better established is the current use of climate models to make projections of the effects of changing the composition of the atmosphere, whether from rising greenhouse gas emissions, air pollution or volcanic eruptions."	David Grimes Canada
1	10	24	10	26	Both natural influences and anthropogenic influences are important over millennial timescales. The expected lifetime of anthropogenic CO <sub>2</sub> -induced climate change is many tens of thousands of years (E.g., refer to Archer and Brovkin, 2008, The millennial atmospheric lifetime of CO <sub>2</sub> , Climatic Change).	David Grimes Canada
1	10	28	10	29	Suggest that "earth-atmosphere system" be changed to "atmosphere-	David Grimes

					earth-ocean system"	Canada
1	11	3	11	5	The purpose of making the distinction between weather and seasonal predictions in this paragraph is not clear. Weather forecasts are better in some regions than others (for example weather forecasts are likely to be poor in poorly-observed regions such as Antarctica) and seasonal forecasts are better in some regions than others.	David Grimes Canada
1	11	8	11	9	"Seasonal climate model" is not a recognized term. Suggest that this could be change to "climate models for seasonal prediction".	David Grimes Canada
1	11	14	11	16	Monitoring alone will not predict ENSO. Dynamical atmosphere-ocean models are also used. Suggest changing "monitoring" to "monitoring and modelling" in line 16.	David Grimes Canada
1	12	31	12	32	Does embedding an RCM increase the skill of seasonal predictions? What is the source of this statement?	David Grimes Canada
1	13	2	13	4	Please cite source of the "recent research" quoted in text.	David Grimes Canada
1	13	12	13	13	Suggest changing "Models can now successfully predict changes in global mean temperature arising from El Niño events and large volcanic eruptions a year ahead" to "Models can now successfully predict changes in global mean temperature arising from El Niño events and following large volcanic eruptions a year ahead " since the eruptions themselves are unlikely to be predicted.	David Grimes Canada
1	13	14	14	6	This section on uncertainty in seasonal predictions focuses probabilistic predictions. However, it doesn't discuss the uncertainties in those predictions, creating an assumption in the text that the probabilistic projections are always right. There are many sources of uncertainty associated with seasonal prediction, but model uncertainty can be particularly important. For example, it could be predicted that there is a 75% chance of warmer than average conditions, but this doesn't mean that there really is a 75% chance of warmer than average conditions. One would need to go back to check whether events predicted at a given probability level actually occurred at that level.	David Grimes Canada
1	15	5	15	6	It could also be noted that higher model resolution doesn't necessarily imply more skill on small spatial scales. Often small-scale phenomena are inherently less predictable, and just increasing model resolution won't necessarily allow phenomena on these scales to be better	David Grimes Canada

					predicted.	
1	15	5	15	6	It is not clear whether the report is stating whether the potential for computational advancement or monetary costs is the limiting factor here. Is the "expected gradual improvement" in computing power limited only by level of investment or also by other technical factors?	David Grimes Canada
1	15	16	15	18	With respect to the reference to the challenge of the length of detailed climate records in developing countries, it could also be noted that there are also similar challenges in parts of the developed world. In particular, the length of detailed climate records is a challenge in the Arctic, which is one of the most vulnerable regions to climate change.	David Grimes Canada
1	16	18	16	18	The definition of climate service in this line does not match the one in the glossary and is also inconsistent with the components of climate services that are described in Chp 1, pg 15, line 32 to page 16, line 2.	David Grimes Canada
1	17	9	17	17	This section begins to identify the synergies or benefits from integrated or joint weather and climate services, but is buried within a discussion on climate data. It is suggested that this section include a more explicit discussion of the potential value of integrating or complementing weather and climate service functions in Chapter 1.	David Grimes Canada
1	3		9		<p>Page 3</p> <p>The description of SIO and El Nino at the bottom of the page appears as if it was drawn from Wikipedia. It is very outdated and reflects in tone none of the huge advances in El Nino science and prediction, based in part of the Tropical Ocean – Global Atmosphere Project of the WCRP – which does not seem mentioned in this report.</p> <p>Page 5 and onward - The use of boxes is fine but boxes should be short and to the point – these are long and poorly written. Box 1.3 is another repetition of definitions.</p> <p>The box on page 9 on weather and climate forecasts is very misleading</p>	G.A. McBean, CM, Ph.D., FRSC Professor and Director, Policy Studies Institute for Catastrophic Loss Reduction Departments of Geography and Political Science The University of Western Ontario London, ON, Canada Phone: 519-661-4274 email: gmcbean@uwo.ca

					and is a very strategic concept.	
1	5	8			"the of" should be deleted	Fumin Ren Climate Monitoring and Diagnostics China Meteorological Administration National Climate Center No. 46 Zhongguancun Nandajie Beijing 100081 China fmren@163.com
1	6	34	6	35	This paragraph should be modified as follows: the general public arranges their daily activities mainly according to weather information instead of climate information.	Guoguang Zheng Administrator China Meteorological Administration 46, Zhongguancun Nandajie Beijing 100081 China 86 10 62172957 86 10 68406662 86 10 62174797 guoji@cma.gov.cn
1	8	15	8	15	"Next week" should be replaced by "next month" as one-week forecast does not fall into the timescale of climate prediction.	
1	15	25			Adding "predictions" after "analyses"	
1	0				This chapters describes existing needs and services related to climate information. However, it does not enough clearly emphasize the emerging needs related to climate change and the need of information for adaptation. The need is mentioned only on page 22, together with reference to adaptation but is not developed !! Climate change is vaguely mentioned and the decadal to centennial timescale poorly decsribed whereas following chapters need all timescales to be introduced in chapter 1.	SYLVIE JOUSSAUME Researcher at CNRS Paris Consortium "climate-environment- society" and ENES LSCE, Orme des merisiers Batiment 712, CE Saclay Gif sur Yvette 91191 France 33169085674 sylvie.joussaume@lsce.ipsl.fr
1	2	7			at the end, add "especcially in the context of climate change"	SYLVIE JOUSSAUME France

1	3	9	3	10	"It is also an era of great change and increasing uncertainty" is very amiguous : I propose "It is also an era of changes in climate and of emerging needs of climate information on possible future climate changes in order to face adaptation needs".	SYLVIE JOUSSAUME France
1	15	21			A part is missing on climate projections and related uncertainties. This will be important for the following chapters. Moreover, nothing is said about emerging research on climate prediction at decadal timescale.	SYLVIE JOUSSAUME France
1	16	16			climate service ... create value : add after climate science : "interdisciplinary studies of impacts of climate change"	SYLVIE JOUSSAUME France
1	17	7			In Box 1.6 : no information is given about climate services that are delivered in relation to climate changes, such as Ouranos in Quebec, noaa services that are implemented, CSC in Germany ....	SYLVIE JOUSSAUME France
1	17	9	17	20	what about climate data from climate projections ?	SYLVIE JOUSSAUME France
1	22	5	22	9	This is an increasingly important need which will ask for a strong increase in climate services. Should be much more developed together with the methodologies and uncertainties associated.	SYLVIE JOUSSAUME France
1	24	7			add "interdisciplinary" : in supporting interdisciplinary research	SYLVIE JOUSSAUME France
1	24	22			add "projections from" climate models	SYLVIE JOUSSAUME France
1	25	21	25	23	Finding 5 relates strongly to my comments but is very poorly introduced and described in chapter 1 !	SYLVIE JOUSSAUME France
1	0				See comment above on the definition of "climate information" (see box 1.6, etc. and consistency with other chapters).	SYLVIE JOUSSAUME France
1	2	9	2	18	Only the impact of climate at the surface is addressed here. However, tridimensional aspects (e.g. structure of the atmosphere) may also have a critical impact, e.g. on aviation safety and efficiency, transport of pollution or volcanic ashes.	SYLVIE JOUSSAUME France
1	7	17	13	13	Only seasonal prediction is addressed in details. While seasonal to inter-annual predictions are mainly driven by initial conditions, and climate scenarios by greenhouse gas forcing, decadal prediction is a mix. The specific features and challenge of decadal prediction should be addressed, considering that it depends both on initial conditions (phase of natural oscillations) and "socio-economic forcing", with very specific	SYLVIE JOUSSAUME France

					<p>predictability issues. This is also necessary as there are large expectations from users. In practice, we suggest to introduce a dedicated section between the one on "the basis for prediction on seasonal to annual time scales" and the one on "Climate change projection" (page 11). Some adjustments are also needed in Box 1.4 ("Beyond a year or so..." : from years to one or two decades, predictability is an open question, expected to depend both on initial conditions reflecting the phase of natural decadal or multi-decadal oscillations and on socio-economic forcing.) . The section on "sources of predictability" should be ammended as well.</p>	
1	11	6	11	7	<p>Check vocabulary: "annual" versus "inter-annual" (also in other parts, e.g 1.4)</p>	<p>SYLVIE JOUSSAUME France</p>
1	13	11	13	13	<p>Refer to decadal predictability issue and ongoing research, make a distinction between ENSO-like predictability and decadal scales</p>	<p>SYLVIE JOUSSAUME France</p>
1	16	18			<p>"A climate service is a product": see comment on définitions above.</p>	<p>SYLVIE JOUSSAUME France</p>
1	24	10	25	2	<p>A reference to the emergence of "service orientated architectures", enabling the access to and combination of web services (instead of databases) could be referred to as an attractive perspective.</p>	<p>SYLVIE JOUSSAUME France</p>
1	2				<p>Climate is not something apart from Weather (see also p.9); it's hard to understand why the document suggests that it is. The climate is simply the statistical description of weather, extending from short time scales out to some arbitrarily chosen long time scale</p>	<p>Carolin Richter Director Global Climate Observing System (GCOS) Avenue de la Paix, 7 bis Geneva Switzerland CRichter@wmo.int</p>
1	2				<p>Historical information thus is the way we define climate. And additional observations going forward provide the basis for estimating if climate is changing. Climate change can only be defined by comparing statistics over some period of interest with historical statistics over previous periods of the same duration.</p>	<p>Carolin Richter GCOS</p>
1	2				<p>The selection of time period over which statistics is computed is very important because weather generally seems to have substantial interannual to decadal variance. Thus trends estimated over only a few decades may easily not be representative of longer-term trends</p>	<p>Carolin Richter GCOS</p>

1	2				Decadal variability effects are likely to dominate over long-term trend effects in many regions over coming decades. This is an active area of research, but the document would be well advised to include decadal variability as a potential source of very serious impacts for many regions.	Carolin Richter GCOS
1	3				Climate includes the statistics of extreme events, but it is important to note that not all damaging weather conditions are rare	Carolin Richter GCOS
1	9				Box 1.4	Carolin Richter GCOS
1	9				Box 1.4 is not helpful. Climate and weather prediction involve the behavior of the coupled land-cryosphere-ocean-atmosphere system. On weather time scales the range of interactions is more limited than that for longer time scales.	Carolin Richter GCOS
1					Suggest that Ch 1 might usefully include a FINDING that makes it clear that the present state of knowledge limits our ability to provide climate services. This can be the result of inadequate historical weather records, lack of appropriate analysis and synthesis of the historical records, lack of predictability of phenomena of societal consequence and inadequacy of observing/forecast systems. Substantial research, historical data recovery and analysis, climate model development and testing, predictability studies, etc. will be needed in coming years to advance our understanding of what climate services appear to be feasible even under ideal conditions	Carolin Richter GCOS
1					Another FINDING might usefully be included describing the importance of local and national and regional efforts to understand their vulnerability to environmental variation. Information about future environmental anomalies will be most useful when vulnerability is understood. This is a risk analysis that should be done by all parties, for each societal benefit area...water, food, energy, transportation, etc	Carolin Richter GCOS
1	25	4	25	7	1. 2nd sentence does not make sense. Individuals, Organizations and Governments do not 'manage climate'	Carolin Richter GCOS
1	25	13	25	17	Climate services are most fundamentally limited by available observations and analyses and on the often-uncertain uncertainty of climate forecasts and projections. It will not be feasible to address all user needs, and this should be made clear at the outset. Discovering	Carolin Richter GCOS

					what information CAN be provided will have to be understood to be a core activity of the coming decade, region by region and topic by topic	
1	25	24	25	27	This is not about climate services and is out of place here	Carolin Richter GCOS
1	5	8			"the of" should be deleted	Carolin Richter GCOS
1	9	36			36 latitude weather systems are easier to model. Improvements in the model physics are likely to alleviate this problem over the next years	Carolin Richter GCOS
1	11	5			seasonal climate predictions which address larger areas and longer time intervals (seasons).	Carolin Richter GCOS
1	12	10			even though drier conditions in arid subtropical regions are expected. The changes in the global water cycle are likely to be one of the most important threats resulting from climate change	Carolin Richter GCOS
1	14	4			understand such forecasts better. The improved awareness and understanding by users on the one hand and the improved provision of information and products for decision making on the other hand, are two elements which, once established, will mutually improve one another continuously. And experience shows that information of this sort can	Carolin Richter GCOS
1	17	7			Sentence is not clear to me. Should it rather read: The delivered service is only useful if the farmer can actually use the information it contains in his or her decision making	Carolin Richter GCOS
1	18	30			An important development will be the provision of authoritative Climate Information Records (CIR) that directly give climate information in an easily understood form, for instance the probability of extreme events like spells of extreme temperature and related trends; or the number of tornadoes within a year in a given area.	Carolin Richter GCOS
1	20	16			I recommend deletion of the last sentence because this rather belongs to the area 'climate information as commercial business'.	Carolin Richter GCOS
1	25	20			Users need expert advice to use this information effectively. It is essential to create a close relationship between expert advisors and users and also to establish a suite of 'clear and simple' climate products (Climate Information Records) that are readily understood by users	Carolin Richter GCOS
1	2	2	2	3	This sentence is not clear.	Ahmad Asgari Academic member

						<p>Climatological research group  Atmospheric Science and Meteorological  Research Center (ASMERC)  ASMERC, Pajoohesh Blvd, Exit No. 15,  Tehran-Karadj Express way  Tehran-Iran  a_asgari1953@yahoo.com</p>
1	4	22	4	22	<p>Climatic factors can be changed to climatic elements (variables). For example, elevation and latitude are climatic factors, and temperature, humidity, precipitation, ... are climatic elements or climatic variables.</p>	<p>Ahmad Asgari  Iran</p>
1	5	8	5	8	<p>I suggest to change rainfall falls to rain falls or rainfall is.</p>	<p>Ahmad Asgari  Iran</p>
1	6	12	6	12	<p>Since there may be different categorizations of hazards, name those climate related hazards that it covers.</p>	<p>Ahmad Asgari  Iran</p>
1	6	13	6	13	<p>counties changes to countries.</p>	<p>Ahmad Asgari  Iran</p>
1	8	28	9	4	<p>What term is used for estimates of future climatic conditions over a range of one year to one decade?</p>	<p>Ahmad Asgari  Iran</p>
1	14	13	14	13	<p>per cent should be changed to percent.</p>	<p>Ahmad Asgari  Iran</p>
1	1	15			<p>Similarly knowledge is a summary and data comes before in a sequence</p>	<p>Peter Holmgren  Director, Climate, Energy and Tenure  Division (NRC)  Natural Resources Management and  Environment Department (NR)  Food and Agriculture Organization of the  United Nations (FAO)  Viale delle Terme di Caracalla  Rome 153  Italy  00-39-06-57052714  00-39-340-2523871  00-39-06-57053250  Peter.Holmgren@fao.org</p>

1	1	21			"Crop diversification" instead of seed diversification	FAO - Italy
1	2	1	2	10	The sequence may be re-organized: characterization - resource management - risk management	FAO - Italy
1	4	18	4	25	medium-term public concerns are more appropriate for policy planning in addition to long-term concerns	FAO - Italy
1	5	8			account of the - delete "of the" it's repeated twice	FAO - Italy
1	5	32			Early warning systems are not defined before; consider defining	FAO - Italy
1	8	Box1.3			In general outlooks should also describe socio-economic impacts	FAO - Italy
1	8	Box1.3	9	Box1.3	Definition of early warning may be included in Box 1.3	FAO - Italy
1	9	6	9	13	Land surface characteristics may be included under the sources of predictability	FAO - Italy
1	10	36			Moisture fields are also part of the initial conditions	FAO - Italy
1	11	35			Land surface characteristics and its feedback	FAO - Italy
1	12	16	12	32	use of climate predictors in operational drought monitoring and flood forecasts	FAO - Italy
1	14	38	14	41	There are number of operational value added products available with weekly and decadal (10 days) timescales	FAO - Italy
1	15	30	15	32	Climate forums are channels of delivery of information	FAO - Italy
1	20	23	20	33	Private TV networks are now playing major role in providing weather and climate services	FAO - Italy
1	21	22	21	33	Charging of forecast and value added data by international forecast centresPrivate	FAO - Italy
1	23	17	23	18	Small Island Developing States may be included in the list	FAO - Italy
1	24	1	24	33	Consistency required: Data, archiving, analysis, delivery, communication, decision making	FAO - Italy
1	25	4	42	27	One conclusion on data availability and future directions	FAO - Italy
1	Fig.1.2				The panel describing normal year is over simplified and may be changed with a different one	FAO - Italy
1	2	13	2	14	We suggest highlighting the livelihoods impact of weather and climate. Suggested text could include:  On the negative side of the ledger, prolonged drought, flooding rains, or unusually bitter winters affect livelihoods, bring insecurity, and sometimes cause death and destruction.	Richard Choularton Senior Policy Officer Office for Climate Change and Disaster Risk Reduction United Nations World Food Programme Via C.G. Viola 68/70 Rome 148

						Italy 0039 066 513 2908 Richard.Choularton@wfp.org
1	5	20	5	23	(1) The example of a 10% chance of hail is weather forecast information, not climate information. It would be better to use an example which is about decision making on the seasonal time scales. (2) It is also unlikely that an orchardist would be able to harvest the crop in time. A better example on these weather forecast time scales would be of protecting against frost in a vineyard using helicopters, etc.	Neil Gordon Meteorological Service of New Zealand P.O. Box 722 Wellington 6015 New Zealand 6444700762 64294700762 neil.gordon@metservice.com
1	8	28	9	4	The box with definitions of prediction terms says that "forecast" is used only in reference to weather forecasts up to a week or so ahead. However, this is inconsistent with other WMO terminology (e.g., Long Range Forecasts by CBS Global Producing Centres) and furthermore is not used consistently throughout this report anyway.	Neil Gordon New Zealand
1	2	2	2	7	o decadal predictions. The definition differs from country to country and region to region. In the US/North America for example, the term used is "climate forecasting" where as in Asia/Africa, the commonly used terminology is "climate prediction". In New Zealand and Pacific Islands, the term used is "climate outlooks". Moreover, the definitions of "Climate product" and "Climate service" appears to be exactly the same meaning but worded differently. I suggest the following definition for climate services "A Climate service is a process that creates benefits by facilitating either a change in society, a change in their physical possessions or a change in their intangible assets through the use of climate information and products (CLIPS)." I also noted there is no definition for "climate information"...Thus it is difficult to distinguish between what is a "climate information, "climate product" and "climate service". There also is a tendency in the report to mix "nowcasting/weather forecasting" with "seasonal, interannual and decadal predictions" and "climate change projections". The differences need to be clearly explained using a 'seamless' diagram...so non-	Penehuro (Pene) Lefale Manager, International Cooperation & Development Science, Research and Development Meteorological Service of New Zealand Ltd (MetService) 30 Salamanca Road Wellington 6140 New Zealand 644-4700 818 64 (0) 27 5700 818 64 4 4735231 pene.lefale@metservice.com

					meteorological (including climatological) communities understand the difference. I also am unsure as to the 'nature' of the report - i.e. whether it should be a 'policy relevant' document or 'policy prescriptive' document. The current draft appears to be a combination of both (i.e. a mix of science and policy). This needs to be spelled out. But regardless of the nature of the report, I strongly recommend inclusion of references to all the findings (figures) & conclusions quoted in report. There also is a tendency in the draft report to take credit for non-climate services.. (e.g. Box I.1: Climate Information and risk management (p.5), it states "An orchardist with a near mature crop of high value fruit may react swiftly to a forecast of hail by harvesting his or her whole crop even if the chance of hail is only 10% and knowing that a lower price will be received for the fruit.." (this is really about weather forecast rather than a climate forecast).	
1	2	10	2	10	Delete "foundational" Suggested text "The climate of a locality affects all aspects of human activities."	Penehuro (Pene) Lefale New Zealand
1	2	13	2	13	Delete "On the negative side of the ledger", to just say "Prolonged drought..."	Penehuro (Pene) Lefale New Zealand
1	2	15	2	16	Delete "weather" or re-arrange the sentence to read "The Climate and weather"..the focus is on "Climate" not "weather"..Replace the word "modern" with "western"	Penehuro (Pene) Lefale New Zealand
1	2	28	2	28	Delete "and large buildings". Large buildings come under the "infrastructure" as well.	Penehuro (Pene) Lefale New Zealand
1	3	2	3	4	Delete "holistic"..delete "physical-biological-social" just called it "complex system"	Penehuro (Pene) Lefale New Zealand
1	3	8	3	10	Amend "El Nino system" to read "El Nino Southern Oscillation (ENSO). Delete "great", replace with "unprecedented".	Penehuro (Pene) Lefale New Zealand
1	3	31	4	2	The sentences "The Southern Oscillation Index.....Considerable expertise is required...This is a core capability.." These do not fit here..and needs to be deleted..the former needs to be included under climate research	Penehuro (Pene) Lefale New Zealand

					chapter and the latter under institutional capacity development chapter/section...	
1	4	5	5	7	Delete "hence". What's a "climate prediction information"? How does this differs from "climate prediction" and "climate information" and/or "climate service"?	Penehuro (Pene) Lefale New Zealand
1	4	19	4	25	Delete "with broad, long -term" (time frame)...as all decision makers are concern about public concerns regardless of the time frame (short term is by far the highest prioroity of politicians for example rather than the long term so they can survive the next election). Insert "national and local community" to read in the sentence "At the global, regional, national and community levels, there are ...."	Penehuro (Pene) Lefale New Zealand
1	4	27	4	27	Delete "such things"	Penehuro (Pene) Lefale New Zealand
1	4	32	4	32	Delete "country's" and "particularly"..Replace "particularly" with "such as"	Penehuro (Pene) Lefale New Zealand
1	5	2	5	5	Delete "of all sizes" Delete "apply it firstly" replace with "use these" Delete "long" and "the" before "day to day"	Penehuro (Pene) Lefale New Zealand
1	5	19	5	19	Delete "can" and insert "s" in play to read "Climate Information plays..."	Penehuro (Pene) Lefale New Zealand
1	6	34	6	34	Delete "planning house building and maintenance" or rephrase...	Penehuro (Pene) Lefale New Zealand
1	6	39	6	41	Delete "factual" Suggest rephrasing the sentence "Students need climate data for research and analysis. Climate data are expected to to become more import for educational purpoises as societies prepare strategies to adapt to climate variability and change and disaster risk management".	Penehuro (Pene) Lefale New Zealand
1	8	9	8	9	Delete the word "observations after the word "systematic" and replace with the following text "collection, archiving and analysis of climate data" to read "systematic collection, archiving and analysis..."	Penehuro (Pene) Lefale New Zealand
1	8	30	8	30	Need clarification on the use of the terminology "forecast". Here, it	Penehuro (Pene) Lefale

					stated "Forecast: Used only in reference to weather forecasts, and hence to weather a week or so ahead". As in my General Comments above (No 1), the USA climate community uses the word "Climate forecasting". Also in the research chapter 3, they also use "climate forecasting". Thus there is a need to revise the definition provided in Box 1.3.	New Zealand
1	9	7	9	8	Delete "El Nino" replace with "ENSO".	Penehuro (Pene) Lefale New Zealand
1	9	26	9	26	Delete "many years" to read "climate is the overall summary of weather conditions over time"	Penehuro (Pene) Lefale New Zealand
1	9	28	9	28	Delete "weather conditions", replace with "state of the atmosphere".	Penehuro (Pene) Lefale New Zealand
1	10	28	10	28	Delete "earth-atmosphere", replace with "atmosphere-ocean"	Penehuro (Pene) Lefale New Zealand
1	11	2	11	2	Insert "the" before "case"	Penehuro (Pene) Lefale New Zealand
1	11	7	11	7	Delete the phrase "For longer time scales.." and replace with "Fore seasonal to inetrannual time scales...The word "forecasts" is used here contradicting the 'defintion' in Box 1.3	Penehuro (Pene) Lefale New Zealand
1	11	31	11	31	Delete "land surface conditions", replace with "land use, land use changes and forestry" (consistent with IPCC language)	Penehuro (Pene) Lefale New Zealand
1	11	34	11	34	Insert "both negative and positive" after the word "feedback" and insert "clouds" beofre the word "melting". This is to recognize "clouds" (solar radiation budget) are the biggest unknown in understanding changes in climate.	Penehuro (Pene) Lefale New Zealand
1	16	18	16	20	I note this is where the definition of 'climate services' used in the report's Glossary originated from. From the explanation, one could detect a 'climate service' is the same as a 'climate product' or "climate information" To avoid confusion, I suggest the inclusion of "climate	Penehuro (Pene) Lefale New Zealand

					information and prediction" as part of the climate service.. My definition of a climate service would be "A Climate service is a process that creates benefits by facilitating either a change in society, a change in their physical possessions or a change in their intangible assets through the use of climate information and products (CLIPS). "	
1	25	8	25	8	Suggest including a new sentence on climate service before Finding 2. Suggested text: "The demand for climate services, defined as a process that creates benefits by facilitating either a change in society, a change in their physical possessions or a change in their intangible assets through the use of climate information and products (CLIPS), is on the increase due to their fundamental roles in climate change adaptation planning and managing climate related risks, particularly at the local community level. However, there is a significant gap between supply of climate services and the needs of users...."	Penehuro (Pene) Lefale New Zealand
1	1				General comment: it would help the reader if at the outset climate change and climate variability are defined (move some of the information in section 1.3. pg 7 up to the beginning) and how present climate services often respond mainly to short term variabilities. This would provide a clearer argument for why the basic institutional infrastructure needs strengthening in order to track long term changes and provide the tools, information needed for decision makers and other actors.	<b>Angela Kallhaug</b> Tel. +46 (0)16 544 22 41  Sweden
1	3	6	3	7	provide an example of an innovative risk management approach (again, for the readers clarity)	<b>Angela Kallhaug</b> Tel. +46 (0)16 544 22 41  Sweden
1	3	21			could elaborate by including "national climate service providers, including meteorological services, national statistical services and relevant research organisations"	<b>Angela Kallhaug</b> Tel. +46 (0)16 544 22 41  Sweden
1	4	22	4	25	expound with an example.	<b>Angela Kallhaug</b>

						Tel. +46 (0)16 544 22 41 Sweden
1	3	12	4	7	ndigenous knowledge systems (esp as used to determine planting seasons, migration (for nomadic and pastoral communities) is an important part of the climate infomration tht is quickly becoming irrelevantdue to cliamte change. It should be reflected here.	
1	5	32			need to clarify what climte risks are as opposed to climate related risks. The terms are used interchangeable in the text	<b>Angela Kallhaug</b> Tel. +46 (0)16 544 22 41  Sweden
1	22	11	22	23	national statistical offices could have a role as service providers to the extent that they hold information of relevance.	<b>Angela Kallhaug</b> Tel. +46 (0)16 544 22 41  Sweden
1	0				General comments on the report. The report makes a strong case for the establishment of the Global Framework of Climate Services. It does so by mapping out the types of climate data, predictions and services that would be needed for management, policy planning and adaptation in a world of variable and changing climate. The report also identifies the sectors that are likely to be key users and beneficiaries of climate data and services and current gaps in data, predictions and communication of climate information across scales. The Global Framework is a much needed international platform that would increase the visibility and channels of access to climate information for purposes of policy planning, sector management, development and adaptation. The report provides a valuable, initial roadmap toward its realization. More specific commends and recommendations on individual chapters are provided below.	Liliana Andonova professor, Deputy Director of the Center for International Environmental Studies Political Science Graduate Institute for International and Development Studies Voie-Creuse 18 Geneva CH-1202 Switzerland liliana.andonova@graduateinstitute.ch
1	25	8	25	2	The existence of a significant gap between the supply of climate services	Liliana Andonova

					and the needs of users is not discussed in much detail in chapter 1, but included in the findings, which creates somewhat of a disconnect between the text of the chapter and finding 2.	Switzerland
1	2	28	2	29	note: risk management approaches have been used much longer. Maybe rephrase to say "formal"	Liliana Andonova Switzerland
1	4	3	4	4	More appropriate: "These products are based predominantly on climate models AND STATISTICAL RELATIONSHIPS DERIVED FROM OBSERVATIONS, and include predictions..."	Alex Rubli MeteoSwiss Krähbühlstrasse 80C Zurich 8044 Switzerland 41442569263 41442569666 alex.rubli@swissonline.ch
1	5	8			Typo: "of the of the"	Alex Rubli Switzerland
1	14	27			Figure B1.5 is missing in the draft	Alex Rubli Switzerland
1	15	16	15	18	I think it should be added here that "statistical downscaling" also requires that the statistical relationships that may have been established on the basis of past data are stationary with time and equally hold for future.	Alex Rubli Switzerland
1	16	22			Typo: "...asks questions such as: HOW hot/cold..."	Alex Rubli Switzerland
1	12	15	15	15	Section 1.4 provides a comprehensive account of techniques, challenges and requirements for the generation of (seasonal) climate PREDICTIONS. However, the specific capabilities and challenges associated with the provision of high-resolution (long-term) climate change PROJECTIONS has not been adequately addressed. I think this would very important, given that the "strong demand for climate services to deal with climate change" has been highlighted in the conclusions of Section 1.6 (p. 25, paragraph 4).	Alex Rubli Switzerland
1	3	2	3	3	8 1.2 Uses and users of climate information Modify lines 2 and 3 on page 3: 1 More recently we have entered a third era where we comprehend the Earth and its climate as a	<b>Jose María Díaz Batanero</b> Policy Analyst Corporate Strategy Division (SG / SPM / CSD) International Telecommunication Union

					<p>2 holistic, globally-interacting system, as is seen so clearly from images obtained by tools on board of satellites images. Computers, 3 observation and telecommunication systems, remote sensing, mathematical models and mapping...</p> <p>Reasons:a) clarify that images are obtained by different applications(e.g. remote sensors) on board of satellites not by satellites; b) the World Weather Watch consists of 3 elements and the Global Telecommunication System is one of them.</p>	<p>e-mail : <a href="mailto:jose.batanero@itu.int">jose.batanero@itu.int</a>  T: +41 22 730 5495  F: +41 22 730 6453  Skype : jmbatanero.itu</p>
1	3	8			"how the El Niño system Works" should be replaced by "how the teleconnections in the earth system work"	<p>Mustafa COŞKUN  Acting Director  Weather Forecasting  Turkish State Meteorological Service  Kütükçü Ali Bey Caddesi  Ankara 61120  Turkey  mcoskun@dmi.gov.tr</p>
1	10	29			"movement" should be replaced by "momentum"	<p>Mustafa COŞKUN  Turkey</p>
1	2	8	2	8	Replace "1.2 Uses and users of..." by "1.2 Use and users of..."	<p>Serhat SENSOY  Chief of Climatology Division, Vice-President of WMO CCI  Agricultural Meteorology and Observation Department  Turkish State Meteorological Service  Kutukcualibey Street No.4 Kalaba  Ankara 6120  Turkey  +905359723305  +903123022456  +903123612371  ssensoy@dmi.gov.tr</p>
1	2	13	2	13	Replace "flooding rains.." by "torrential rains..."	<p>Serhat SENSOY  Turkey</p>
1	2	17	2	17	Please omit one of them "such as, for example"	<p>Serhat SENSOY  Turkey</p>

1	5	8	5	8	"of the " is duplicated, please delete one of them.	Serhat SENSOY Turkey
1	14	8	14	27	Figure B1.5 doesn't exist.	Serhat SENSOY Turkey
1	2	2	2	7	Should also include how scientists observe the climate, in addition to make predictions	Roger Street Technical Director UK Climate Impacts Programme Oxford University Oxford University Centre for the Environment, South Parks Road Oxford OX1 3QY United Kingdom of Great Britain & Northern Ireland roger.street@ukcip.org.uk
1	2	11	2	11	...warm conditions can accelerate plant growth and...	Roger Street UK
1	2	28	2	30	Increasingly precise data on the probability of rare and damaging conditions may not be correct. This is based on rare events are still problematic as these are rare events (see extreme analysis theory). In addition, uncertainties exist and in the case of extreme events these are more acute. I would suggest using increasing more robust information on the probability of rare damaging conditions	Roger Street UK
1	3	4	3	4	...provide the tools that can help unravel the complexity...	Roger Street UK
1	3	7	3	9	I would suggest that the current condition (and trend) of the observation networks is putting this capability at risk.	Roger Street UK
1	3	12	3	14	This may be the case because, for the most part, that is what is available. A description of the climate can be useful, but many would argue insufficient. The need is for decision-relevant climate information, often more than a description of the climate.	Roger Street UK
1	3	22	3	26	Once again are these just what is available or are they really decision - relevant. It would be helpful to explore this issue, although I would suggest that this may not be possible at this time.	Roger Street UK
1	4	7	4	17	...either for example by increasing efficiency or by reducing costs. This change is suggested as efficiency and reduced costs are only part of the	Roger Street UK

					criteria that are used for evaluating decisions (e.g., also include social and economic development, cultural and political benefits, etc.)	
1	5	3	5	3	...either for example by increasing efficiency or by reducing costs. This change is suggested as efficiency and reduced costs are only part of the criteria that are used for evaluating decisions (e.g., also include social and economic development, cultural and political benefits, etc.)	Roger Street UK
1	5	8	5	8	... taking full account of the relevant climate and non-climate drivers and minimising the..	Roger Street UK
1	5	13	5	14	...his or her livelihood may be considering shifting from crops to animals will need to explore this option by considering the intial investment... This change is suggested as the example appears to be too prescriptive as presented.	Roger Street UK
1	6	24	6	24	Estimate accurately. I would suggest that the insurance industry would want to estimate accurately the risks involved, but they are also realistic. They would want to have robust estimates of the risks involved.	Roger Street UK
1	7	14	7	14	It is not clear as to what developments depend on continued public investment. Are they the benefits referred to above (continuing to realise these benefits depends on continued public investment)?	Roger Street UK
1	8	14	8	14	Most uses of climate information... not sure that this is true. There is considerable interest in future climate but there is still a significant demand for past and current climate information. Unclear if this is based on a clear understanding of the market.	Roger Street UK
1	9	9	9	9	...conditions change slowly, the associated temperature anomalies may last a few...	Roger Street UK
1	9	22	9	22	Not clear if this is the message we want to put forward, but it is definitely not consistent with messages in the rest of the document. I would suggest that there remain challenges / deficiencies.	Roger Street UK
1	10	38	10	38	...'assimilated' into models that are then run forward...	Roger Street UK
1	10	40	10	40	The use of "accuracy" here and throughout the document needs further consideration. Accuracy in what context and in whose perspective? Accuracy may not be what is required nor achievable. There is and always be uncertainties in observations, predictions and projections. Most users do understand this. I would suggest not using this term	Roger Street UK

					unless it is clearly defined. Users do want information that can inform decisions with some consideration as to the robustness (e.g., likelihood and confidence).	
1	12	3	12	4	I would note that there are also assessments (impacts, vulnerability and adaptation assessments) within the IPCC reports that are based on observational data.	Roger Street UK
1	12	32	12	32	I would suggest that RCMs use GCMs as initial and boundary conditions	Roger Street UK
1	14	15	14	15	... usable accuracy. From whose perspective? I would suggest informative is the requirement. See earlier comment about the use of accuracy	Roger Street UK
1	14	26	14	26	Can they actually reduce flood impacts or take action that lead to reduced consequences (suggest the latter)?	Roger Street UK
1	14	30	14	41	I would expect some statement (or reference to the upcoming section in this document) on the state of observational networks and the limited availability of those observations.	Roger Street UK
1	14	32	14	32	...and ocean using a wide variety of instruments...	Roger Street UK
1	14	38	14	41	I am not sure that this text belongs in a section of good observations. I understand the link, but there are many other important messages that could be included here. For example, what is the state of observations at the local, regional and global scales? I would suggest that observations at all these scales are limited when looked at from the perspective of informing decisions. If the observations at all these scales have limits and uncertainty, what does that mean for future simulations.	Roger Street UK
1	15	11	15	11	Suggest that accurate is inappropriate and not founded.	Roger Street UK
1	15	13	15	21	Would not statistical downscaling methods (e.g., weather generators) also fall into this category	Roger Street UK
1	15	24	15	25	Is this scope of services sufficient? There is a need for a consistent message throughout the text about what comprises climate services within the GFCS. Support and engagement (more than providing advice) are also needed.	Roger Street UK
1	15	24	15	32	This should reflect the fact that providing descriptions of the climate are	Roger Street

					necessary, but insufficient. In addition, providing access to climate information may not be sufficient to achieve the GFCS goals.	UK
1	16	1	16	2	Supporting use and the evolution of climate information and services are also essential	Roger Street UK
1	16	6	16	6	...a growing capability to define and provide decision-relevant information.	Roger Street UK
1	16	10	16	10	..for supplying nd meeting the demand for climate services...	Roger Street UK
1	16	10	16	16	Suggest that there is also a need for user engagement skills and capacity to deliver.	Roger Street UK
1	16	18	16	20	See comment within the introduction related to supply driven versus defining climate services based on an evolving balance between supply and demand.	Roger Street UK
1	16	22	16	22	... such as: how hot/cold will it be...	Roger Street UK
1	16	23	16	23	I would suggest that to be decision-relevant, 30-year averages may not be sufficient.	Roger Street UK
1	18	3	18	17	This also hold for data from predictions and projections. I would also suggest that this holds true for derived and other decision-relevant beyond those that describe the climate.	Roger Street UK
1	18	25	18	25	A knowledgable climatologist working with informed users can answer such questions...	Roger Street UK
1	18	28	18	30	I would suggest that the role is to work with users to develop decision-relevant information based on authoritative climate products. This products identified are those that can inform the development of what is needed.	Roger Street UK
1	20	13	20	16	A critical challenge is evaluation of the product/sevices available with the intent to act upon the evaluation.	Roger Street UK
1	21	9	21	9	...national economic and social development including adaptation to a changing climate and...	Roger Street UK
1	22	24	22	22	Some would suggest that some NMHS or components thereof are actually operating as private sector service providers, but at least are in competition with others.	Roger Street UK
1	24	8	24	8	Some would suggest that some NMHS or components thereof are actually operating as private sector service providers, but at least are in	Roger Street UK

					competition with others.	
1	24	35	24	35	... applications, and supporting and advising on their...	Roger Street UK
1	25	13	25	14	...information is dependent on achieving a balance between the evolving needs of circumstance of users with the capabilities of climate science.	Roger Street UK
1	25	15	25	15	the need to also include balance with scientific capabilities and maintaining credibility.	Roger Street UK
1	25	27	25	27	... and to adapt to climate variability and change.	Roger Street UK
1	0				There is no mention of the WMO Climate Watch system (for seasonal ranges) that has been defined and is being implemented in some regions.	John Hirst Permanent Representative of the UK with WMO and CE of the Met Office FitzRoy Road Exeter EX1 3PB United Kingdom of Great Britain & Northern Ireland  mike.gray@metoffice.gov.uk (for correspondence purposes)
1	4	14	4	16	The report refers to delivering “an end-to-end system for providing climate services and applying them in decision making”. We would argue that it is very difficult to do this because of the wide range of information that decision-makers need to draw from. The impacts of climate change that businesses are interested in are often not climate itself, but the impact of the climate on the environment (e.g. flooding) or how it will affect their activities (e.g. will a temperature increase mean that buildings become un-usable or that a chemical process in their factory becomes less efficient?). Therefore to make a decision, users must draw on research from all the different disciplines. More likely, they will use consultants to gather all this information and help them to a decision. The GFCS should recognise that they are part of a “supply chain” and that they need to make links to a wide range of researchers and to a community of translators/consultants, who are close to user needs and will be working with them to make decisions.	John Hirst UK

1	22	10	23	5	It may be better to differentiate between free at the point of use services, and paid for services, rather than differentiate between public sector and private sector providers. In some countries, such as the UK, the public sector is required to provide value-added paid for services in competition with other providers.	John Hirst UK
1	22	6			"where the information can be privatised" doesn't make any sense.	John Hirst UK
1	8	6	8	12	"A complete knowledge . . ." It would be helpful to point out that a complete knowledge is not needed before taking action. Incomplete knowledge is often enough to guide sound decision making. E.g., to design culverts on highways it is important to know that heavy precipitation is increasing but one doesn't need to know the exact percentage increase per year to 3 decimal places.	Thomas C. Peterson, Ph.D. President, WMO Commission for Climatology Chief Scientist, NOAA's National Climatic Data Center 151 Patton Avenue Asheville, NC 28801 Voice: +1-828-271-4287 Fax: +1-828-271-4246
1	18	16			Metadata" should be defined, perhaps "Metadata, such as station history information, . . ."	Thomas C. Peterson USA
1	22	5	22	9	This paragraph is very fuzzy.	Thomas C. Peterson USA
1	3	11	4	7	Phenology is not referred to until Chapter 3 (page 13) yet is a highly valuable method to observe changes in local climate, especially in developing states where technology is lacking. There are also practical means under development to collect this information from on-ground survey participants, possibly via cell phones, that could be utilized. Even if not capitalized on, I suggest explaining it as a 'type of climate information in common use' (p3) and then can explain later why not taking on its coordination/collection if that is the case.	Tracy Raczek External Relations Specialist UNIFEM (part of UN Women) 304 East 45th Street New York City 10017 United States of America 1.212.906.6897 tracy.raczek@unifem.org
1	4	24	4	25	Add BIODIVERSITY agreements to list of those for which this information is important.	UNIFEM - USA
1	7	15	7	16	Add research DISSEMINATION as an additional area in need of public investment	UNIFEM - USA
1	13	24	13	25	Recommend mentioning element of uncertainty much earlier in paper to lend credibility.	UNIFEM - USA
1	17	4	17	7	These lines speak only briefly to the complexity and challenge of providing useful information to the variety of stakeholders in need of	UNIFEM - USA

					the information at the community and household level. These challenges include social and cultural norms that may prevent some populations (women, indigenous, extremely poor) from receiving info, including in a format that is useable -- depending on literacy rates, access to technology, etc. The example in Box 1.6 is a bit shallow when it gets down to end-users on the ground (at end of Box) and reference to the challenges described above could be included or perhaps an explanation of the specific circumstances in Africa or Australia example elaborated more.	
1	25	24	25	27	Finding #6, although presumably true, does not have clear support or stem from evidence in this Chapter.	UNIFEM - USA
1	4	26	4		We suggest calling out "planners" separate from policy-makers	Daniel A. Reifsnyder Deputy Assistant Secretary for Environment & Sustainable Development Department of State 2201 C Street, N.W. Washington, D.C. 20520 United States of America 202-647-2232 202-647-0217 reifsnderda@state.gov
1	5	26			Change "poor" to "subsistence" farmer	Daniel A. Reifsnyder USA
1	5		5	31	Box 1.1 Is this a good example? It seems to fall squarely in the realm of weather forecasting and actions on a similar time scale.	Daniel A. Reifsnyder USA
1	8	36	8	12	"A complete knowledge . . ." It would be helpful to point out that a complete knowledge is not needed before taking action. Incomplete knowledge is often enough to guide sound decision making. E.g., to design culverts on highways it is important to know that heavy precipitation is increasing but one doesn't need to know the exact percentage increase per year to 3 decimal places.	Daniel A. Reifsnyder USA
1	10	0			It is not really accurate to claim, as this title suggests, that climate models evolved from weather models. Also, this section hardly talks about climate models at all - it is a description of global weather models. This section adds little value to the discussion.	Daniel A. Reifsnyder USA

1	13	16	14	30	Suggest adding text in Section 1.4 that explains the uncertainties associated with extreme events	Daniel A. Reifsnyder USA
1	15	28			Add section to discuss the important types of climate information overlooked in the discussion. Climate information currently in use goes far beyond forecasts, predictions and projections to information on observed changes in physical and biological systems, assessment of impacts, etc.	Daniel A. Reifsnyder USA
1	15	28			Add section to discuss the important types of climate information overlooked in the discussion. Climate information currently in use goes far beyond forecasts, predictions and projections to information on observed changes in physical and biological systems, assessment of impacts, etc.	Daniel A. Reifsnyder USA
1	16	1			This is the first of the references to the the importance of a dependable operational capability for climate services. In fact, climate services are not dependant on operational capabilities in the way weather services are. Climate services and information are often NOT operational but can be periodic, or responsive to a particular question. This is just one example of a weather bias that exists in multiple places in this document.	Daniel A. Reifsnyder USA
1	18	37			"Metadata" should be defined, perhaps "Metadata, such as station history information, . . ."	Daniel A. Reifsnyder USA
1	22	1	22	9	This paragraph is very fuzzy.	Daniel A. Reifsnyder USA
1	25	6	25	26	Section 1.6 needs to be more carefully crafted to avoid sounding self evident (finding 1), or sounding self-serving (findings 3 and 4; 'users need expert...' construct sounds like we have the answer).	Daniel A. Reifsnyder USA
1		3			General comment: This chapter is supposed to address current capabilities yet some sections talk about a lack of current capacity (climate services in developing countries, pg 23 line 6-18) or tools that don't yet exist (technologies for the future, pg 24 line 10-pg 25 line 2). Both of these sections are better suited to Part II where the discussion on needs and opportunities should reside.	Daniel A. Reifsnyder USA
1		23			General comment: This chapter is supposed to address current capabilities yet some sections talk about a lack of current capacity (climate services in developing countries, pg 23 line 6-18) or tools that	Daniel A. Reifsnyder USA

					don't yet exist (technologies for the future, pg 24 line 10-pg 25 line 2). Both of these sections are better suited to Part II where the discussion on needs and opportunities should reside.	
1					Chapter 1 could benefit from a more robust introduction to the issue of climate services, what they entail, and why we should have a climate information system and climate services. There is insufficient discussion of emerging requirements and the compelling changes required related to climate change.	Daniel A. Reifsnnyder USA
1	5	18	5	31	Box 1.1 Is this a good example? It seems to fall squarely in the realm of weather forecasting and actions on a similar time scale.	Stephen Zebiak Director-General International Research Institute for Climate and Society Columbia University Lamont Campus, 61 Route 9W Palisades, NY 10964 United States of America 1-845-680-4497 1-845-680-4468 1-845-680-4866 steve@iri.columbia.edu
1					ITU Comments on Draft HLT Report.doc to insert from Word doc.	
1	5	6			not clear that a design engineer would be responsible for estimating cash flow	Antonio J. Busalacchi Chair, Joint Scientific Committee, World Climate Research Programme
1	Box1.1				independent of the title this is a weather example not specific to climate	Antonio J. Busalacchi WCRP
1	Box1.2				same comments as above except for the last two sentences	Antonio J. Busalacchi WCRP
1	9	1		4	where is the interannual to decadal time scale?	Antonio J. Busalacchi WCRP
1	9	6		13	it should be noted that the ocean conditions referred to are specific to the Pacific Ocean	Antonio J. Busalacchi WCRP
1	10	10		16	This reads overly optimistic and again is specific to the tropical Pacific.	Antonio J. Busalacchi WCRP
1	13	20			Pacific Ocean	Antonio J. Busalacchi

						WCRP
1	14	32			land surface?	Antonio J. Busalacchi WCRP
1	15	2		4	this is not true. AR4 demonstrated there is no consensus on changes in the modes of variability such as ENSO under climate change	Antonio J. Busalacchi WCRP
1	15	7		12	the link between resolved orography and precipitation is a stronger example	Antonio J. Busalacchi WCRP
1	15	13		21	other approaches include stretched and adaptive	Antonio J. Busalacchi WCRP
1	16	18			Awkward	Antonio J. Busalacchi WCRP
1	17	15		17	These are the sorts of examples that are lacking in their treatment in this document and need considerably more attention.	Antonio J. Busalacchi WCRP
1	22	1			e.g. ?	Antonio J. Busalacchi WCRP
1	25	8		12	While this may be an ultimate finding it has not been suitably justified in the discussion in this chapter.	Antonio J. Busalacchi WCRP
1					<p>This chapter, for some unknown reasons, strives very hard to provide non-standard and novel definitions for forecasting, prediction, climate and weather. The very unfortunate result is confusion, lack of focus and clarity, and contradiction with well established WMO conventions. In the very first pages of Chapter 1, Box 1.1 ( Title: "<i>Climate information and risk management</i>") uses the forecast of a hail storm (an undisputable very short range weather prediction ) to discuss the links between climate information and risk management! This is quite surprising for a document on climate services, and we could think of many much better examples to provide.</p> <p>Another major confusion is introduced in Box 1.4 (Title: "<i>Why weather forecasts and climate predictions are different</i>"). In the EC RTT report, where the concept of seamless and unified modeling was defined and later formally endorsed by the WMO at EC LXI, it was agreed that the forecast or prediction definitions should follow the WMO CBS standard,</p>	<p>Beland Michel (ASTD)  <a href="mailto:Michel.Beland@ec.gc.ca">Michel.Beland@ec.gc.ca</a>  CAS</p>

				<p>agreed upon and used by most of the NMHS's. It stands to reason that this should be the same for this document. It was also agreed that increasingly, at least in the modeling and prediction multiverse, there is no wall between weather and climate, but rather a continuum, where skill is expanding both in time and spatial scales, within the concept of earth system modeling. This chapter appears to be ignoring this critical change of perspective, and is in a sense advocating a step backward.</p> <p>Why the word prediction in this document is reserved exclusively for climate is a mystery. Firstly, the words forecast and prediction are synonyms, in both the English and French language, and have been and are used interchangeably. The correct word as one moves on to forecast or prediction of averages or departures from normals is outlooks or scenarios. One could also call it a climate forecast or prediction, the important word here being "climate".</p> <p>This unnecessary confusion is quite disturbing since NWP (Numerical Weather Prediction) is one of the most used acronyms in the weather and climate community to identify weather forecasting. With this new definition NWP is an oxymoron! It could also raise a lot of confusion on the role of national weather services in delivering , as they are already doing so, an important number of so-called climate services, from data to monthly and seasonal forecasts!. If a ten-day weather forecast becomes a climate prediction, then uninformed or non-specialists decision and policy makers in many countries could decide to cut investments in their own national NMHS in order to create this new service.</p> <p>We should also note this is contradicting the Principle 7 found in Chapter 9: The role of this framework will be to facilitate and strengthen, not to duplicate. We should add "not to confuse". In fact, if one reads through chapter one, the words seasonal forecasts and seasonal predictions occur interchangeably in at least a dozen instances (and rightly so), thus immediately contradicting the point made in Box</p>	
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				<p>1.4.</p> <p>It could be true that the climate community has different definitions, but we cannot go forward and make a fruitful discussion whilst not sharing the same definitions of forecast/predictions, again noting that forecast and prediction are synonyms in French and English. As a reminder we provide here the definitions of the NWP weather based community supported by WMO Commission for Basic System:</p> <p>1. NOWCASTING : 0 -2 HOURS DESCRIPTION OF FORECASTED WEATHER PARAMETERS  2. VERY SHORT-RANGE WEATHER FORECASTING: UP TO 12 HOURS DESCRIPTION OF WEATHER PARAMETER  3. SHORT-RANGE WEATHER FORECASTING: BEYOND 12 HOURS AND UP TO 72 HOURS DESCRIPTION OF WEATHER PARAMETERS  4. MEDIUM-RANGE WEATHER FORECASTING: BEYOND 72 HOURS AND UP TO 240 HOURS DESCRIPTION OF WEATHER PARAMETERS  5. EXTENDED-RANGE WEATHER FORECASTING: BEYOND 10 DAYS AND UP TO 30 DAYS DESCRIPTION OF WEATHER PARAMETERS, USUALLY AVERAGED AND EXPRESSED AS A DEPARTURE FROM CLIMATE VALUES FOR THAT PERIOD.</p> <p>6. LONG-RANGE FORECASTING: FROM 30 DAYS UP TO TWO YEARS:  6.1 MONTHLY OUTLOOK  6.2 THREE MONTH OR 90 DAY OUTLOOK  6.3 SEASONAL OUTLOOK</p> <p>7. CLIMATE FORECASTING: BEYOND TWO YEARS</p>	
1	4		25	<p><i>Page 4 - Under the heading of "Users, decision making and adding value"</i></p> <p>The needs of persons with disabilities should be included.</p> <p><i>Under the heading of "Uses in policy and planning"</i></p> <p>The following paragraph can be added under this heading:</p>	<p>Oyuna Umuralieva  Human Rights Officer  Human Rights, Economic and Social Issues Section  Development and Economic and Social Issues Branch  Office of the High Commissioner for Human Rights  Av. Giuseppe Motta 48 (of. 1-03)</p>

				<p>In practical terms, a human rights-based approach can be used to guide policies and measures of climate change mitigation and adaptation. It can inform assessments, and strengthen processes, ensuring access to essential information, effective participation, and the provision of access to justice (remedies). The Guidance Note for UN country teams (UNCTs) on <i>Integrating Climate Change Considerations in the Country Analysis and the United Nations Development Assistance Framework (UNDAF)</i> integrates a human rights-based approach, requiring that UNCTs consider in what ways, and to what extent, anticipated changes in climate will impede economic and social development at relevant levels, including consideration of poverty reduction, strengthening human rights and improving human health and well-being.</p> <p><i>p-15 – Overview of climate services provision</i>  <i>P 20 - Tailored products 1 and services</i>  <i>P 21 - 3 Data access and pricing policies</i></p> <p>The following paragraphs can be added under these headings:</p> <p>The needs of persons with disabilities should be considered under the “<i>specific requests or in anticipation of the needs of particular groups.</i>” <i>Services may be supplied free or at a price – for persons with disabilities such services should be provided for <b>free or be affordable</b>. Channels for delivery for persons with disabilities should be provided in a format that is required, for instance, for persons with sensory disabilities (vision and hearing).</i></p> <p>For background purposes, article 2 of the Convention on the Rights of Persons with Disabilities defines “Communication” as including: languages, display of text, Braille, tactile communication, large print, accessible multimedia as well as written, audio, plain-language, human-reader and augmentative and alternative modes, means and formats of communication, including accessible information and communication technology.</p>	<p>CH-1211 Geneva 10  Switzerland  Phone: + 41 22 928 9647  Fax. +41 22 928 9050  Email: <a href="mailto:oumuralieva@ohchr.org">oumuralieva@ohchr.org</a>  OHCHR</p>
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					<p><i>p-25 Findings</i></p> <p>Add the following expression (in bold below):</p> <p>There is a significant gap between the supply of climate services and the needs of users. This is most pronounced in developing countries and least developed countries, which are also the most vulnerable to the impacts of climate variability and change. Climate knowledge is often not fully exploited and developed into climate services that are available to those that need them most, <b>especially persons with disabilities</b>.</p>	
1	2	1	25	27	<p>Most of the sections define the process but do not propose any improvements. The capabilities presented are more of the science and not institutional capabilities and challenges. The approach in the definition of capabilities applies for almost all chapters.</p>	<p>Dr William Nyakwada Strategic Planning and Risk Management Officer, Office of the Assistant Secretary-General, World Meteorological Organization 7 bis, avenue de la Paix CH-1211 GENEVE 2, SWITZERLAND Tel: +41 22 730 84 58 Fax:+41 22 7308023 Email:wnyakwada@wmo.int</p>
1	16	39	17	5	<p>The definition of Climate Outlook Fora does not represent the reality. RCCs and NMSs develop seasonal outlooks during the pre-fora processes, which are integrated and presented at the fora. NMSs would feel offended if it is indicated that they only publicise the outlook. They are actually the engine of the process and dont only publicise the outlook.</p>	
1	19	23	24	9	<p>The original concept of the GFCS came up with the four elements with the CSIS seen to play the role of producing the services from observations and resaerch supported with existing programmes such as World Climate Programme. The concept had an interface to link the producers(CSIS) with the users. With the current change in the role of</p>	

				<p>the interface to be the producer, do you still need CSIS. If it is for communication, we did not have GTS for weather and GTS for Climate. Similarly WIS can support weather and climate needs as relates to communication.</p> <p>However, i see CSIS in the form of GDPFS as an engine for generating services and the interface as PWS for service delivery.</p> <p>In the report of the conference it is indicated that outcome of the user interface programme will be reflected in the operational services of the CSIS. The four elements were defined in a way that they fulfil the desire of the world leaders in declaration to strengthen the production, availability, delivery and application of science-based prediction and services. While the focus on the user is good, the need to improve the quality of services and service delivery requires a holistic approach.</p>	
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