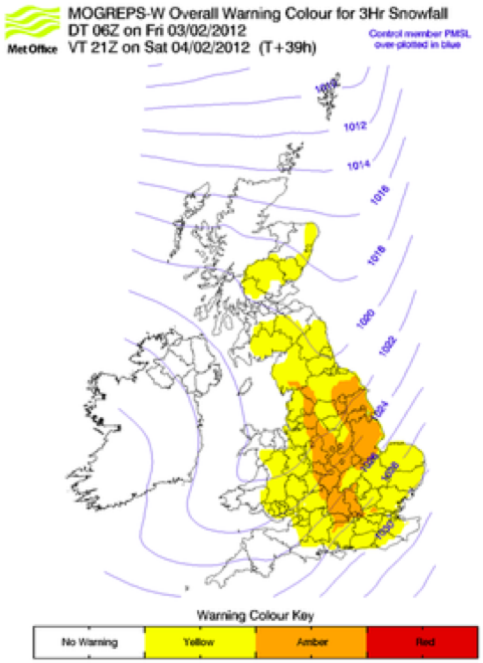
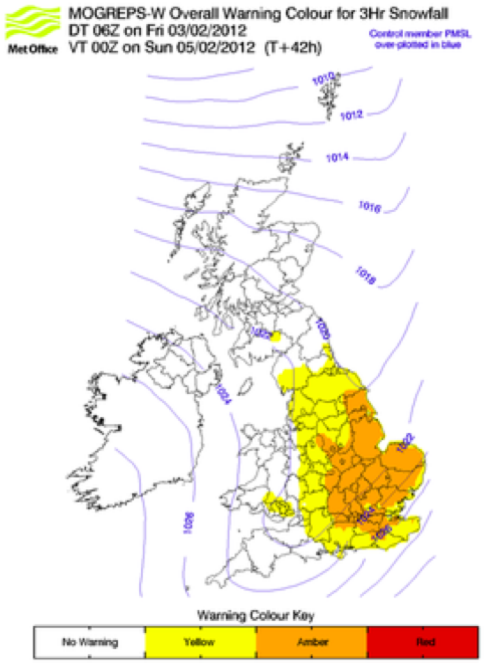
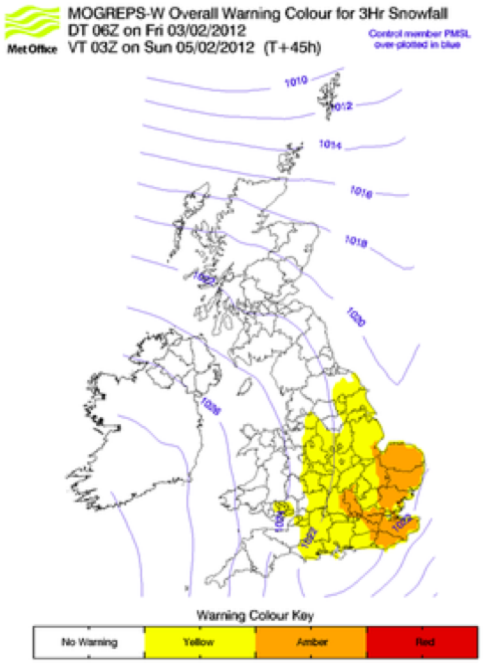
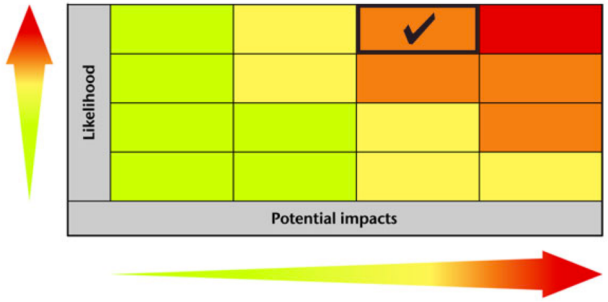
Examples:
Risk-based impact forecasts



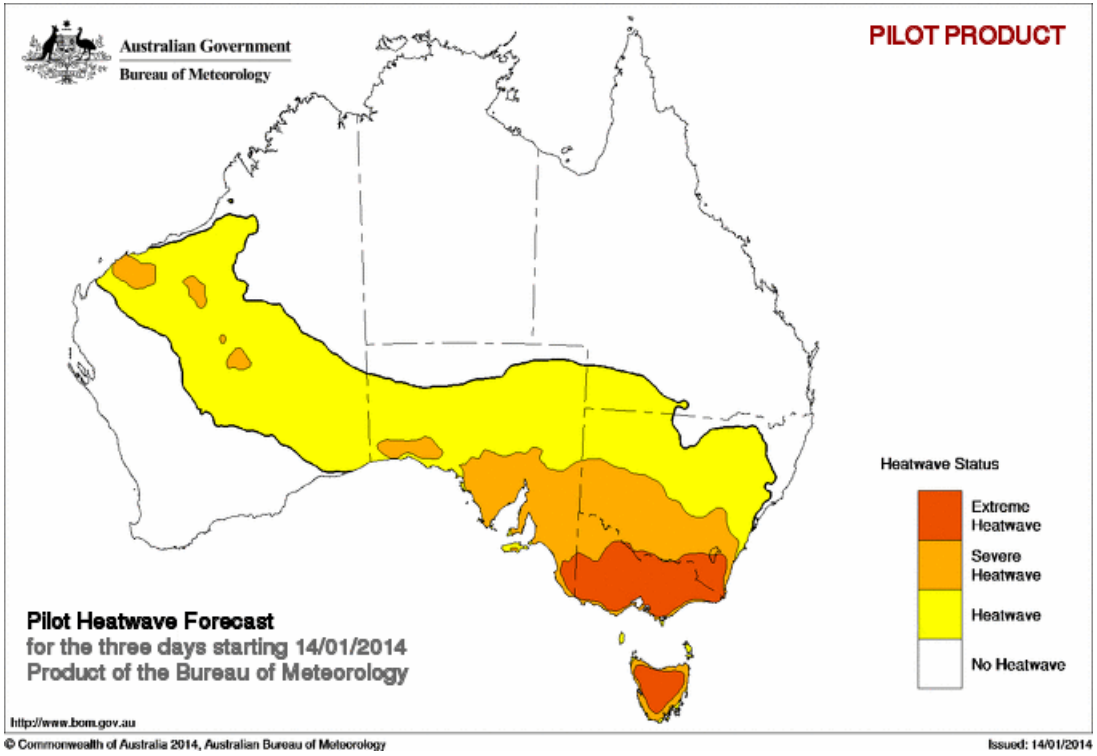




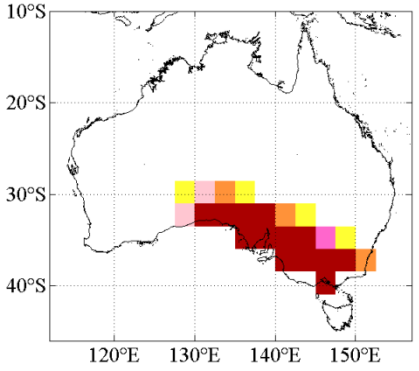


http://www.metoffice.gov.uk/research/news/weather-warnings

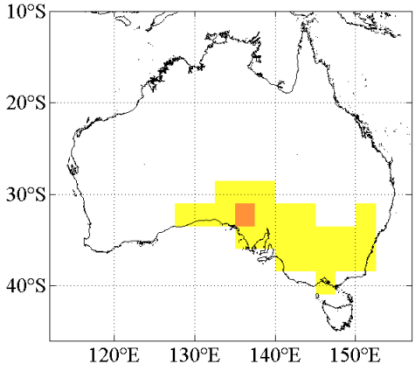
Examples:
S2S heatwave warning pilot forecasts



wk2



Obs.



POAMA

Heatwave forecasting on the S2S timescale based on the *pilot* heatwave forecast. For more information see: http://www.bom.gov.au/australia/heatwave/

04

Challenges and opportunities

Challenges (and opportunities): Using S2S predictions

Opportunities

- There is a growing requirement for the use of S2S predictions for a wide range of societal and economic applications **= opportunity**
- Research is currently exploring 'windows of forecast opportunity' on the S2S timescale where the skill in predicting in temperature and rainfall in certain regions is likely to be increased using teleconnections to known large-scale climate drivers (e.g. ENSO), but there is much work to be done to link this to applications and products that can support user decision-making
- The new open source near real-time S2S project database (hosted by ECMWF and CMA), for the first time, presents an opportunity for researchers and practitioners to explore the skill and applications of S2S

Challenges (and opportunities):
Using S2S predictions

Opportunities

– Opportunity to extend/continue existing initiatives/projects, e.g. HEPEX and IMPREX in the hydro-meteorological space, to better understand user needs:

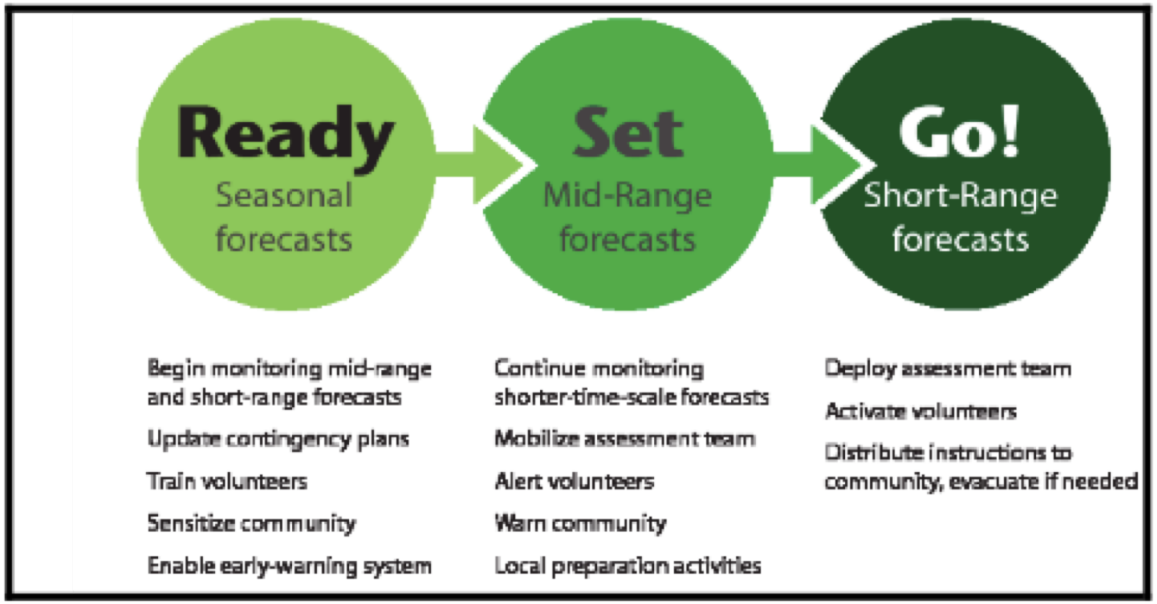
S2S4E
Climate Services for Clean Energy

imprex
Learn from today to anticipate tomorrow

Challenges (and opportunities):
Using S2S predictions

Opportunities

– Opportunity to help bridge the gap between climate and weather forecasts (i.e. seamless multiple timescale forecasting) such as the Red Cross-IRI 'Ready-Set-Go!' approach:



Goddard *et al.* (2014) *Earth Perspectives*

Challenges (and opportunities):
Using S2S predictions

Challenges

– Applications can't get too far ahead of the science, e.g. issues such as model resolution, ensemble size, hindcast data availability, initialisation, inherent uncertainties, biases and systematic errors, extremes

– Promotion of the S2S timescale: is there a genuine gap/need for S2S forecasts?

– Focus needs to be more on applications:

- Which sectors/end-users/decision-makers?
- What are the users' needs?
- What decisions are made on S2S timescales?
- What applications and methods of communication are appropriate for each sector?

Challenges (and opportunities): Using S2S predictions

Challenges

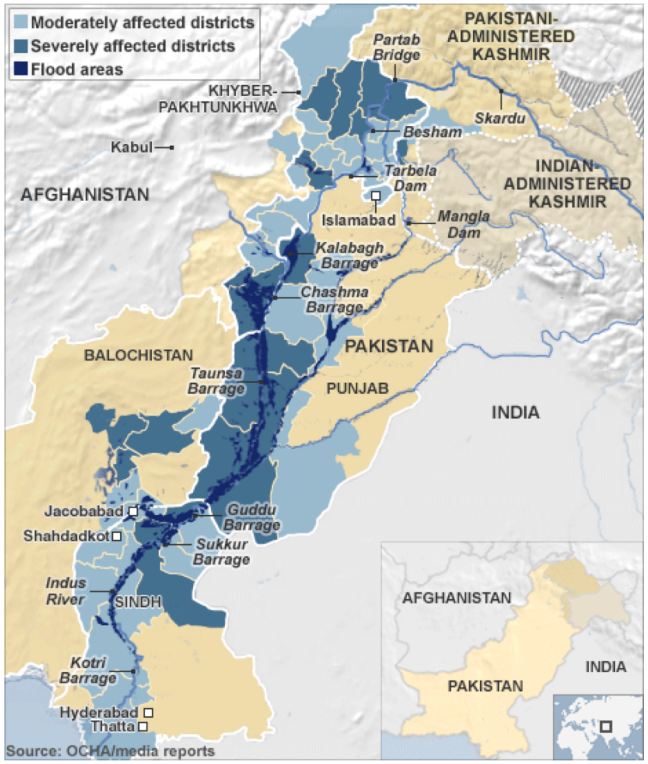
The key to the success (both development and uptake) of longer-range forecasting depends on communication:

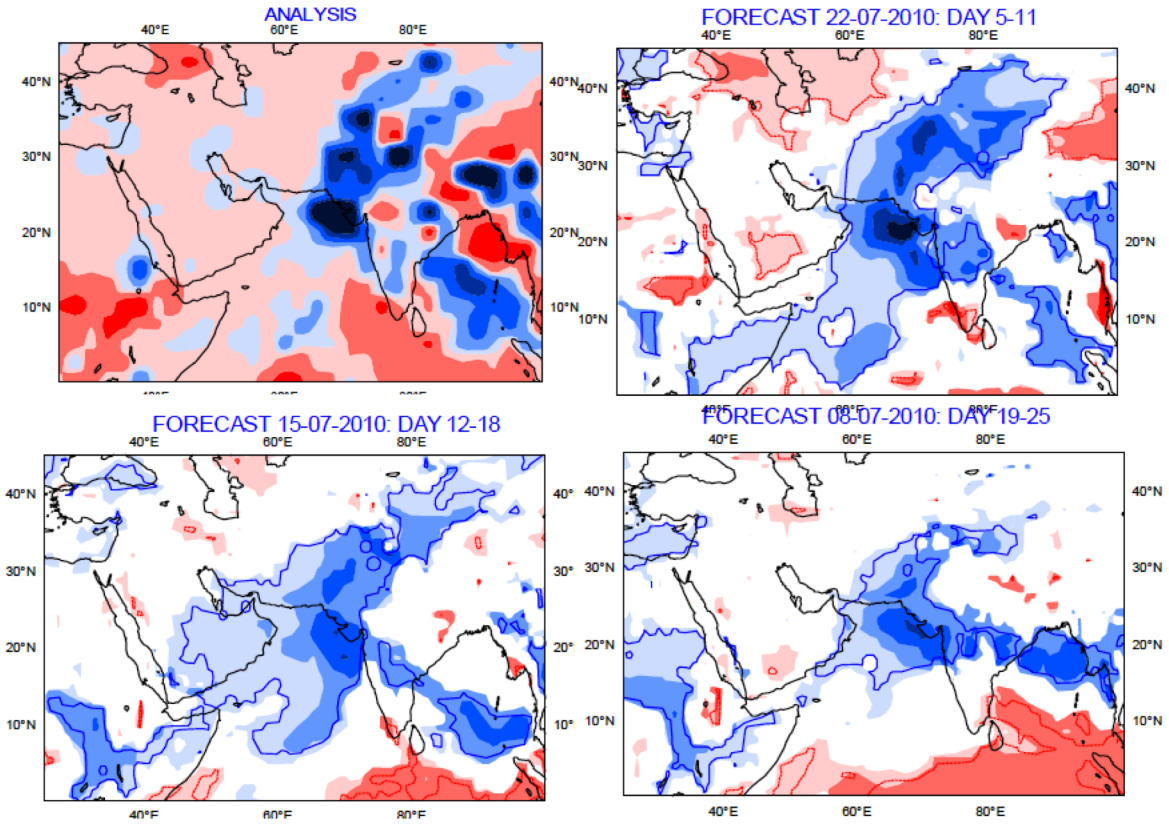
- Understanding user needs and delivering appropriate impact-based, actionable applications based on ‘climate services’ approaches
- Incorporating communication into forecast products and applications
- Understanding risk (and risk perception) rather than just the hazard
- Demonstrating both predictability (skill) and uncertainty
- Utilisation of methods and tools from other prediction timescales (e.g. climate or weather)
- Model development and better observations

Challenges (and opportunities):
Using S2S predictions

Challenges

– Lack of case studies and ‘success stories’





Thank you

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Paper:

White, C.J. *et al.* (2017) Potential applications of subseasonal-to-seasonal (S2S) predictions, *Meteorological Applications*, 24:3, 315-325 doi:10.1002/met.1654 https://rmets.onlinelibrary.wiley.com/doi/full/10.1002/met.1654

METEOROLOGICAL APPLICATIONS
Meteorol. Appl. (2017)
Published online in Wiley Online Library
(wileyonlinelibrary.com) DOI: 10.1002/met.1654

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Review

Potential applications of subseasonal-to-seasonal (S2S) predictions

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ABSTRACT: While seasonal outlooks have been operational for many years, until recently the extended-range timescale referred to as subseasonal-to-seasonal (S2S) has received little attention. S2S prediction fills the gap between short-range weather prediction and long-range seasonal outlooks. Decisions in a range of sectors are made in this extended-range lead time; therefore, there is a strong demand for this new generation of forecasts. International efforts are under way to identify key sources of predictability, improve forecast skill and operationalize aspects of S2S forecasts; however, challenges remain in advancing this new frontier. If S2S predictions are to be used effectively, it is important that, along with science advances, an effort is made to develop, communicate and apply these forecasts appropriately. In this study, the emerging operational S2S forecasts are presented to the wider weather and climate applications community by undertaking the first comprehensive review of sectoral applications of S2S predictions, including public health, disaster preparedness, water management, energy and agriculture. The value of applications-relevant S2S predictions is explored, and the opportunities and challenges facing their uptake are highlighted. It is shown how social sciences can be integrated with S2S development, from communication to decision-making and valuation of forecasts, to enhance the benefits of 'climate services' approaches for extended-range forecasting. While S2S forecasting is at a relatively early stage of development, it is concluded that it presents a significant new window of opportunity that can be explored for application-ready capabilities that could allow many sectors the opportunity to systematically plan on a new time horizon.

KEY WORDS climate prediction; forecasting; decision-support; ensemble forecasts; extremes; extended-range; seasonal prediction

Received 25 June 2016; Revised 6 December 2016; Accepted 7 December 2016

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