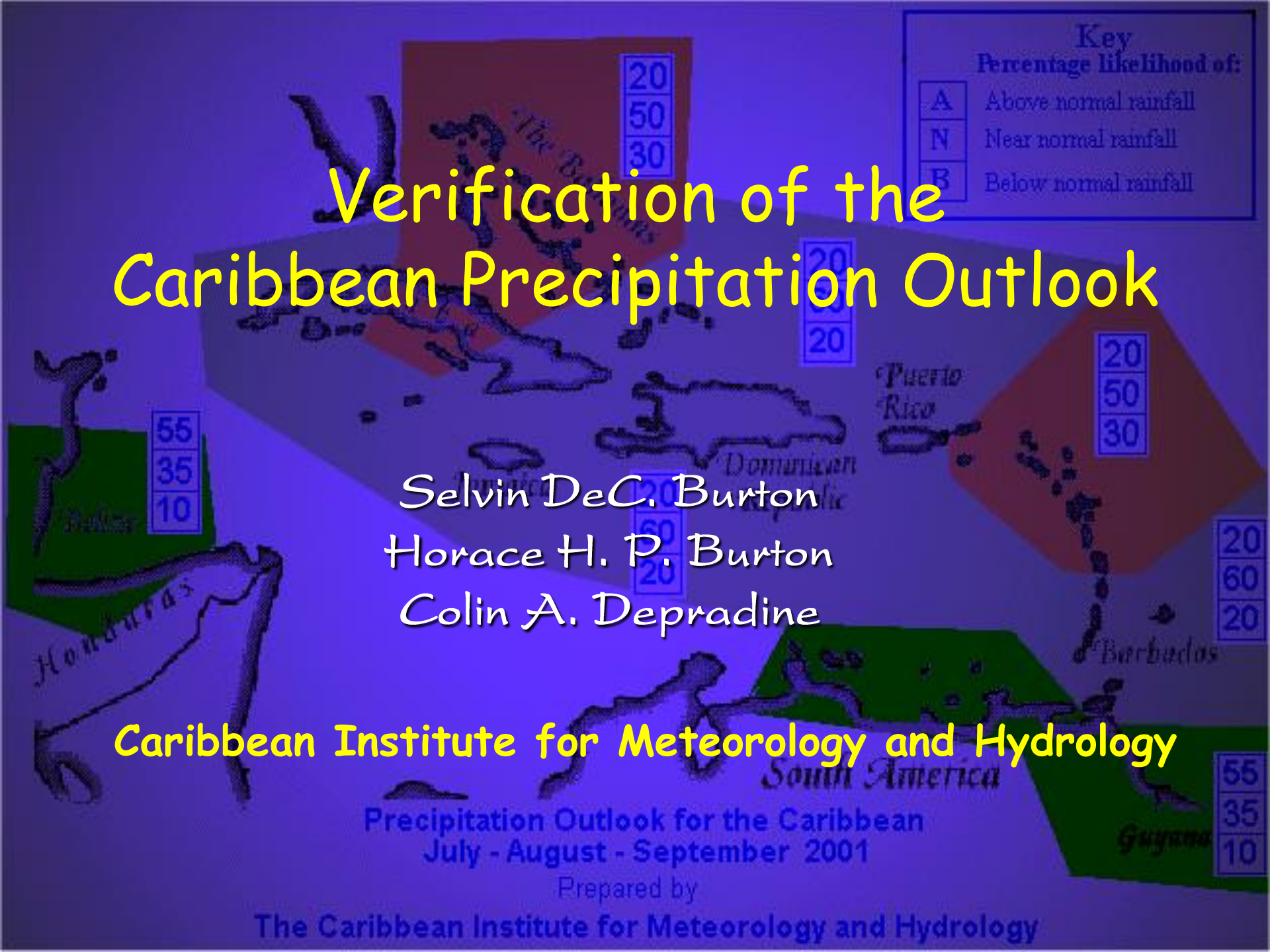
Verification of the Caribbean Precipitation Outlook

Selvin DeC. Burton
Horace H. P. Burton
Colin A. Depradine

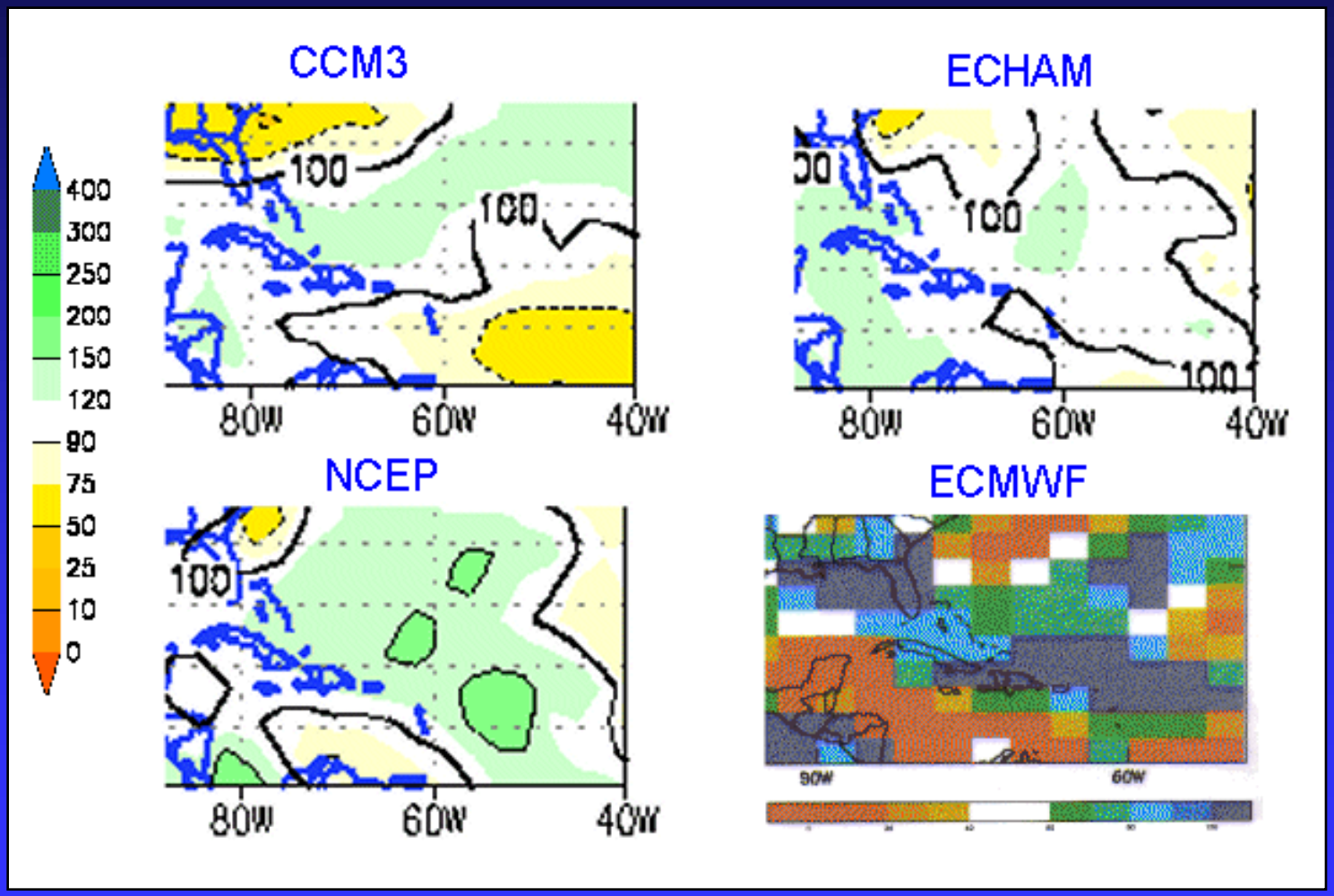
Caribbean Institute for Meteorology and Hydrology



Introduction

- CIMH has been preparing a three-month precipitation probability outlook for the Caribbean region since 1998 with input from some of the regional meteorological services and research groups
- The outlook is produced by combining objective input (dynamic climate model output) and subjective input (experience)

Introduction



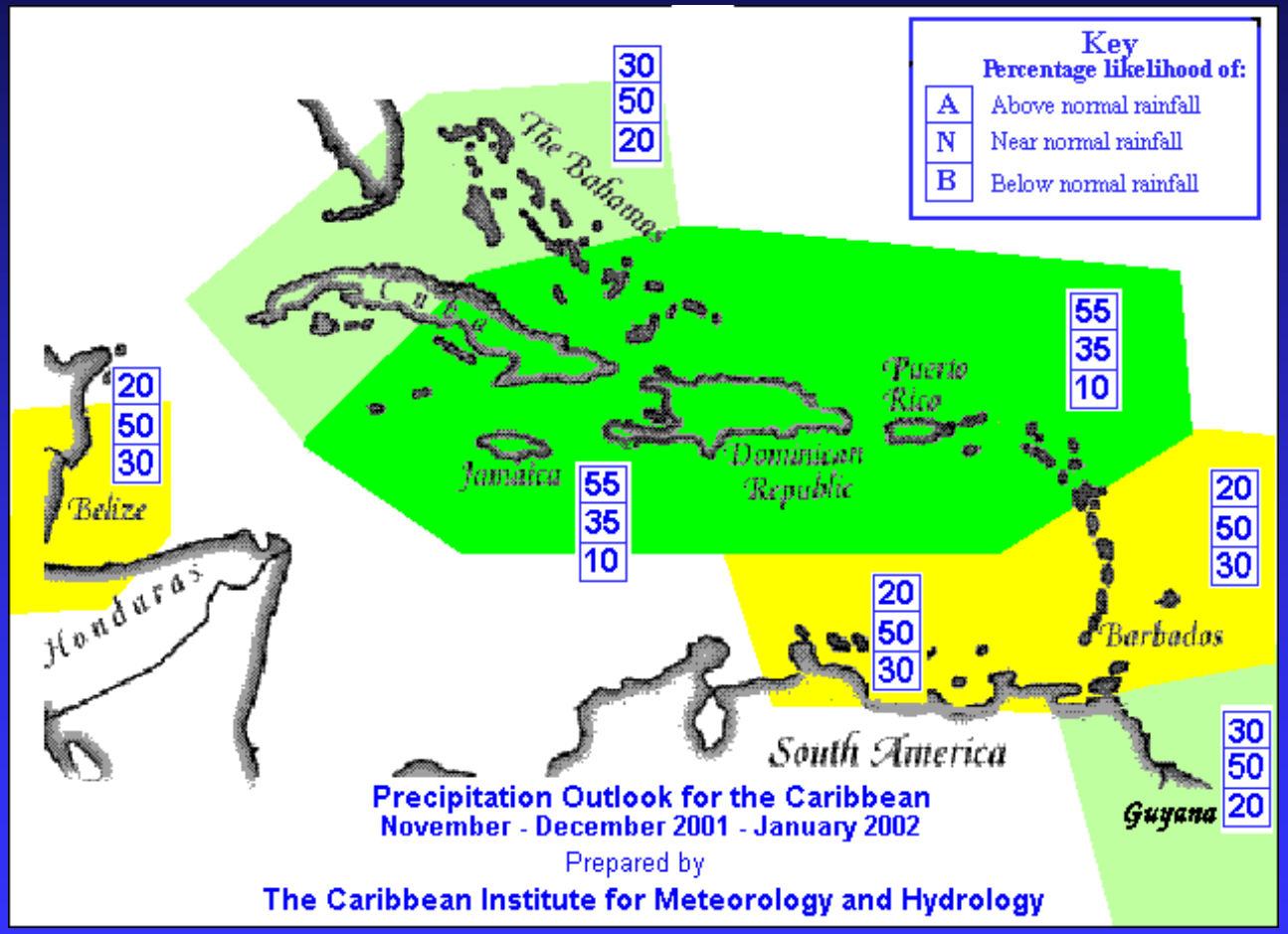
Introduction

- Probabilities are estimated for a number of sub-regions based on
  - level of agreement between the different models
  - subjective confidence in the different predictions based on the current conditions and knowledge of the local climatic conditions
- Probabilities provided by the various contributors are consulted to present a consistent forecast

Introduction

- Outlook is presented in the form of a map of tercile probabilities
- Terciles separate the possible outcomes into three categories
  - Above normal - wettest third of record
  - Near normal - middle third of record
  - Below normal - driest third of record
- Each possible outcome is assigned a probability

Introduction



Introduction

- Forecast verification is essential for monitoring forecast reliability and for ensuring credibility for users
- Current probabilistic format of the precipitation outlook makes it difficult to develop a meaningful quantitative measure of its performance

Purpose of study

- CIMH previously used a simple approach to verify the probability outlooks by computing anomalies for period
- This paper examines the use of tercile intervals as a means of verifying the precipitation outlook for Barbados for 2000 and 2001

Data and method

- Monthly rainfall for 50 years (1950-1999) from five selected stations is used to compute average monthly rainfall for Barbados
- Three-month averages are computed for the 50 years and ranked to determine island-wide tercile intervals

Data and method

- Borderline between the upper and middle tercile and between the middle and lower tercile define the tercile boundaries

Tercile Boundary	JFM	FMA	MAM	AMJ	MJJ	JJA	JAS	ASO	SON	OND	NDJ	DJF
UPPER	70	72	78	107	142	175	191	211	217	201	152	93
LOWER	54	50	54	75	101	131	160	172	174	150	111	75

Verification

- Monthly rainfall for the same five stations for 2000 and 2001 used to verify the precipitation outlook for Barbados
- Three-month averages are computed for the 2-year period
- Twelve outlooks prepared – 6 in each year
- Verification of 11 undertaken

Results - *2000 verification*

FMA 2000

	20	
72	**55**	65
50	**25**	

AMJ 2000

	10	
107	**45**	61
50	**45**	

MJJ 2000

	20	
142	**30**	
101	**50**	76

JAS 2000

	20	
191	**40**	
160	**40**	151

SON 2000

	10	243
217	**50**	
174	**40**	

NDJ 2000-1

	30	183
152	60	
111	10	

Results - *2001 verification*

JFM 2001

	20	
70	**40**	
54	**40**	24

MAM 2001

	10	
78	**30**	
54	**60**	31

MJJ 2001

	10	
142	**30**	121
101	**60**	

JAS 2001

	20	
191	**60**	181
160	**20**	

SON 2001

	20	
217	**60**	176
174	**20**	

Conclusions

- The results of the verification for eleven of the twelve forecasts prepared show that
  - eight forecasts verified in the tercile with the highest forecast probability
  - two verified in the tercile with the second highest forecast probability
  - only one verified in the tercile with the lowest probability.

Future work

- Results, even though from a small sample from one island, suggest some skill (predictability) in the precipitation outlooks
- Skill scores are a true measure of the level of predictability of the forecasts
- Skill scores difficult to define over short a period, as is the case with the CIMH's forecasts

Future work

- A typical variation of skill by location and season requires more than a couple of years of forecasts
- Skill scores have some meaning when averaged over all seasons and/or over large areas
- This approach may be used for CIMH's outlooks over short term

Future work

- Extending the verification to other countries to test the reliability of the forecasts over the region
- Compute skill scores as a measure of the level of predictability of the forecast