

USSOUTHCOM



Miami, Florida

SCJ5-PAS Modeling, Simulation, and Analysis Support To USSOUTHCOM

LTC Saul A Grandinetti

Overall Classification Of
This Briefing:
UNCLASSIFIED

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Purpose

**Present USSOUTHCOM J5-PAS
State Of The Union Brief**

**Industry Days
2-5 June 1999**

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Agenda



- **USSOUTHCOM AOR And Mission**
- **J5-PAS Mission And Organization**
- **TOOLS**
 - **Description**
 - **Examples Of Use**
 - **Evaluation**
- **Future Outlook**

USSOUTHCOM AOR



SHAPE

A Stable, Prosperous,
Democratic Region Cooperating
To Achieve Mutual Interests

RESPOND

An Effective Capability And
Will To Respond To
Theater Challenges And
Support Counter Drug
Operations

PREPARE

Postured To Capitalize
On Future Opportunities

EXECUTE

Accomplishing USSOUTHCOM's Mission

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USSOUTHCOM Mission



USSOUTHCOM Shapes The Environment Within Its Area Of Responsibility By Conducting Theater Engagement And Counterdrug Activities In Order To Promote Democracy, Stability And Collective Approaches To Threats To Regional Security: When Required Responds Unilaterally Or Multilaterally To Crisis That Threaten Regional Stability Or National Interests, And Prepares To Meet Future Hemispheric Challenges.

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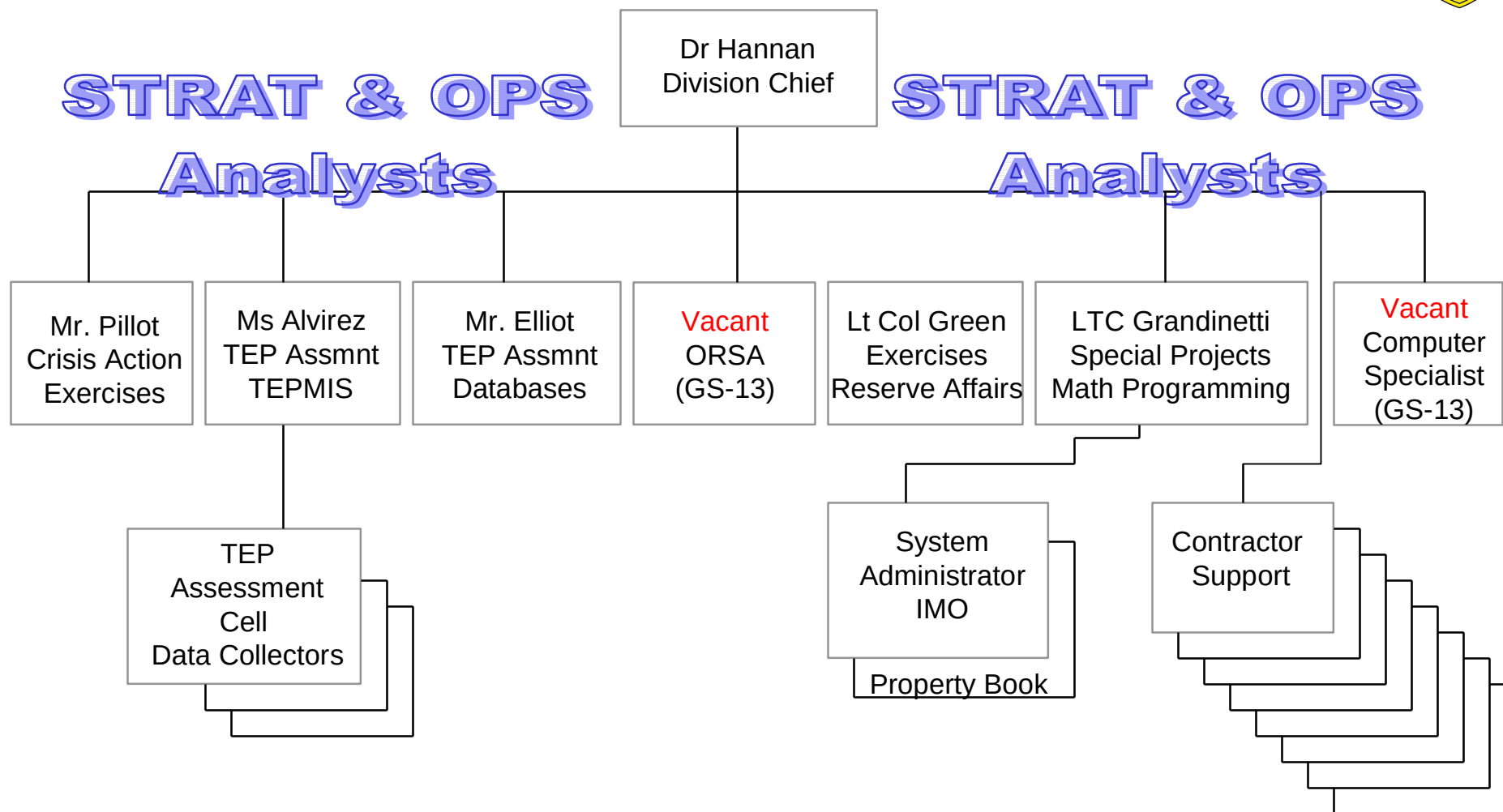
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PAS Mission



- **Provide Modeling Simulation And Analysis Oversight And Support To CINC, Staff, And Components In:**
 - **Theater Engagement Planning**
 - **Deliberate Planning**
 - **Crisis Action Planning**
 - **Exercise Program**
 - **Special Projects**

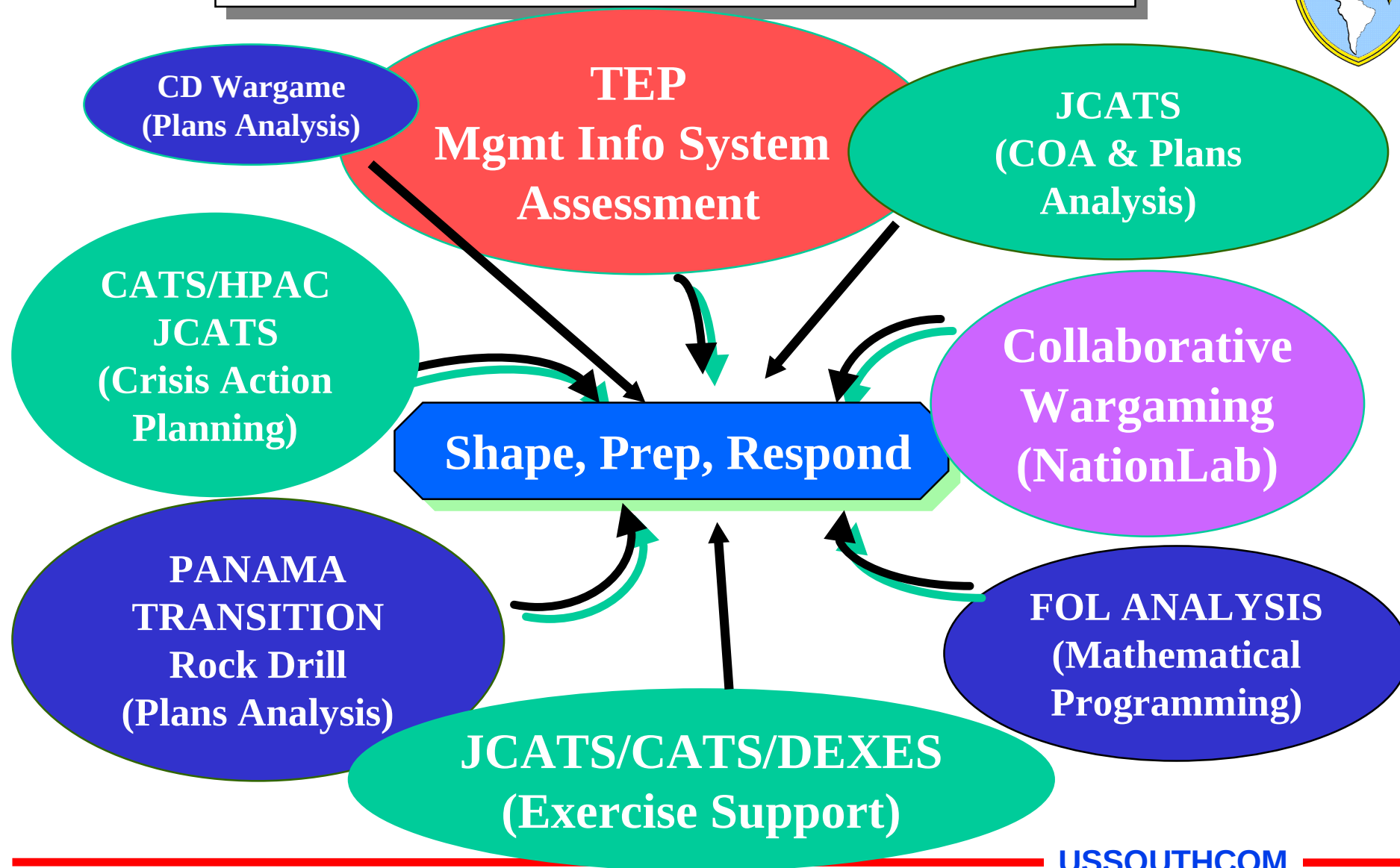
PAS Organizational Chart



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Types Of Missions



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Tools

- **EXCEL** **Spreadsheet**
- **CATS** **Consequences Assessment Tool Set Model**
- **JCATS** **Joint Conflict And Tactical Simulation Model**
- **DEXES** **Deployable Exercise System**
- **NATIONLAB** **Custom Model (STELLA Software)**

EXCEL Spread Sheet



- **Real World Support And Analysis**
 - **Panama Transition ROCK Drill Analysis**
 - **Course Of Action Comparisons**
 - **Forward Operating Location Analysis**
 - **Other**

Panama Transition Plan

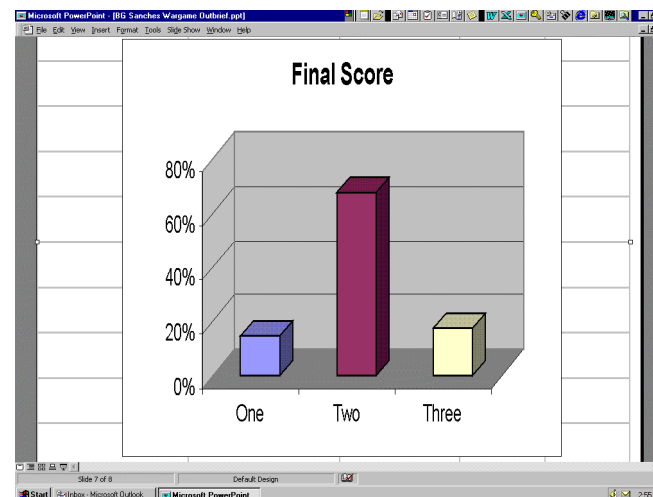


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COA Comparison



<u>Verbal Preference</u>	<u>Rating</u>
Extremely preferred	9
<i>Very strongly to extremely</i>	8
Very strongly preferred	7
<i>Strongly to very strongly</i>	6
Strongly preferred	5
<i>Moderately to strongly</i>	4
Moderately preferred	3
<i>Equally to moderately</i>	2
Equally preferred	1



<u>Final Score</u>						
	Attribute #1	Attribute #2	Attribute #3	Attribute #4	Attribute #5	Final Score
One	7%	7%	22%	7%	9%	15%
Two	70%	74%	69%	66%	62%	68%
Three	23%	19%	9%	27%	29%	17%
Total	100%	100%	100%	100%	100%	100%

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FOL Analysis



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1	All	Zone #1	Zone #2	Zone #3	Zone #4	Zone #5	Zone #6	Zone #1	Zone #2	Zone #3	Zone #4	Zone #5	Zone #6	Zone #1	Zone #2	Zone #3	Zone #4	Zone #5	Zone #6
3	Aircraft / Location	FOL#1	FOL#1	FOL#1	FOL#1	FOL#1	FOL#1	FOL#2	FOL#2	FOL#2	FOL#2	FOL#2	FOL#2	FOL#3	FOL#3	FOL#3	FOL#3	FOL#3	FOL#3
4	C-130	4.667	3.333333	2	8	4.6667	3.33333	4	6.6667	0.6667	7.3333	5.3333	4.6667	3.3333	6	0	6.6667	6	4.6666667
5	C-141	7.429	6.285714	5.142857	10.2857	7.4286	6.28571	6.8571	9.1429	4	9.7143	8	7.4286	6.2857	8.57143	3.4286	9.1429	8.57143	7.4285714
6	C5	7.6	6	4.4	11.6	7.6	6	6.8	10	2.8	10.8	8.4	7.6	6	9.2	2	10	9.2	7.6
7		19.7	15.61905	11.54286	29.8857	19.695	15.619	17.657	25.81	7.4667	27.848	21.733	19.695	15.619	23.7714	5.4286	25.81	23.7714	19.695238
8																			
10	Coverage Per Sortie	C-130						C-141						C5					
11	From/To	Zone #1	Zone #2	Zone #3	Zone #4	Zone #5	Zone #6	Zone #1	Zone #2	Zone #3	Zone #4	Zone #5	Zone #6	Zone #1	Zone #2	Zone #3	Zone #4	Zone #5	Zone #6
12	FOL#1	4.667	3.333333	2	8	4.6667	3.33333	7.4286	6.2857	5.1429	10.286	7.4286	6.2857	7.6	6	4.4	11.6	7.6	6
13	FOL#2	4	6.666667	0.666667	7.33333	5.3333	4.66667	6.8571	9.1429	4	9.7143	8	7.4286	6.8	10	2.8	10.8	8.4	7.6
14	FOL#3	3.333	6	0	6.66667	6	4.66667	6.2857	8.5714	3.4286	9.1429	8.5714	7.4286	6	9.2	2	10	9.2	7.6
15	FOL#4	2.667	5.333333	0	6	6.6667	4	5.7143	8	2.8571	8.5714	9.1429	6.8571	5.2	8.4	1.2	9.2	10	6.8
16	FOL#5	2	4.666667	0	5.33333	7.3333	4	5.1429	7.4286	1.7143	8	9.7143	6.8571	4.4	7.6	0	8.4	10.8	6.8
17	FOL#6	1.333	4	0	4.66667	8	4	4.5714	6.8571	0.5714	7.4286	10.286	6.8571	3.6	6.8	0	7.6	11.6	6.8
18																			
20	Number Of Sorties ?	C-130						C-141						C5					
21	From/To	Zone #1	Zone #2	Zone #3	Zone #4	Zone #5	Zone #6	Zone #1	Zone #2	Zone #3	Zone #4	Zone #5	Zone #6	Zone #1	Zone #2	Zone #3	Zone #4	Zone #5	Zone #6
22	FOL#1	0	0	0	0	0	0	15.941	0	4.6667	0	0	0	5.9975	0	0	3.5172	0	0
23	FOL#2	0	0	0	0	0	0	0	0	0	0	0	3.3923	0	1.2	0	0	0	0
24	FOL#3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	FOL#4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	FOL#5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27	FOL#6	0	0	0	0	18	0	0	0	0	0	0	0	0	0	0	0	17.2853	0
28																			
29	Total					Total	18					Total	24					Total	28
30	Max					Max	18					Max	24					Max	28
31																			
33	Total Coverage	C-130						C-141						C5					
34	From/To	Zone #1	Zone #2	Zone #3	Zone #4	Zone #5	Zone #6	Zone #1	Zone #2	Zone #3	Zone #4	Zone #5	Zone #6	Zone #1	Zone #2	Zone #3	Zone #4	Zone #5	Zone #6
35	FOL#1	0	0	0	0	0	0	118.42	0	24	0	0	0	45.581	0	0	40.8	0	0
36	FOL#2	0	0	0	0	0	0	0	0	0	0	0	25.2	0	12	0	0	0	0
37	FOL#3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	FOL#4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	FOL#5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	FOL#6	0	0	0	0	144	0	0	0	0	0	0	0	0	0	0	0	200.509	0
41																			
43	Calculated Coverage	C-130						C-141						C5					
44		0	0	0	0	144	0	118.42	0	24	0	0	25.2	45.581	12	0	40.8	200.509	0
45																			
46																			
47																			
48						Total Required Coverage	164	12	24	40.8	344.51	25.2		Total					
49						Additional Coverage	164	12	24	40.8	42	25.2		610.51	<= MAX				
50							7E-10	2.3E-11	6E-13	6E-10	302.51	-1E-09		HRS					
51																			
52																			
53																			
54																			

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EXCEL Spreadsheet



- **Strengths Of Tool:**
 - User Friendly
 - Quickly Solves Small Mathematical Problems (Solver)
 - Easily Adaptable To Graphical Displays
- **Weaknesses Of Tool:**
 - Limited Modeling Capabilities
 - Limited Flexibility
- **Challenges Of Employment/Operations:**
 - Recognition Of Tool's Potential
 - Understanding Existing Models
 - Maintaining Proficiency In Modeling

Consequence Assessment Tool Set (CATS)



- **Real World And Training Support Analysis**
- **Predicts and Displays the Damages, Casualties, and Effects Of:**
 - **Natural Disasters**
 - **Man-made Disasters**
- **Developed by U.S. Federal Emergency Management Agency (FEMA)
And U.S. Defense Special Weapons Agency (DSWA)**

CATS



- **Combines State-of-art Hazard Forecasting Algorithms, Graphics And Weather Inputs**
 - Eg, Estimates Damages In Hurricane's Projected Path
- **Processes Databases Including Population Density, Terrain Elevation, Road Systems, Airfields to:**
 - Forecast And Display Number Of Displaced Personnel
 - Forecast And Display Damages To Structures
 - Identify Airfields, Hospitals, Etc. (Staging Operations)

CATS



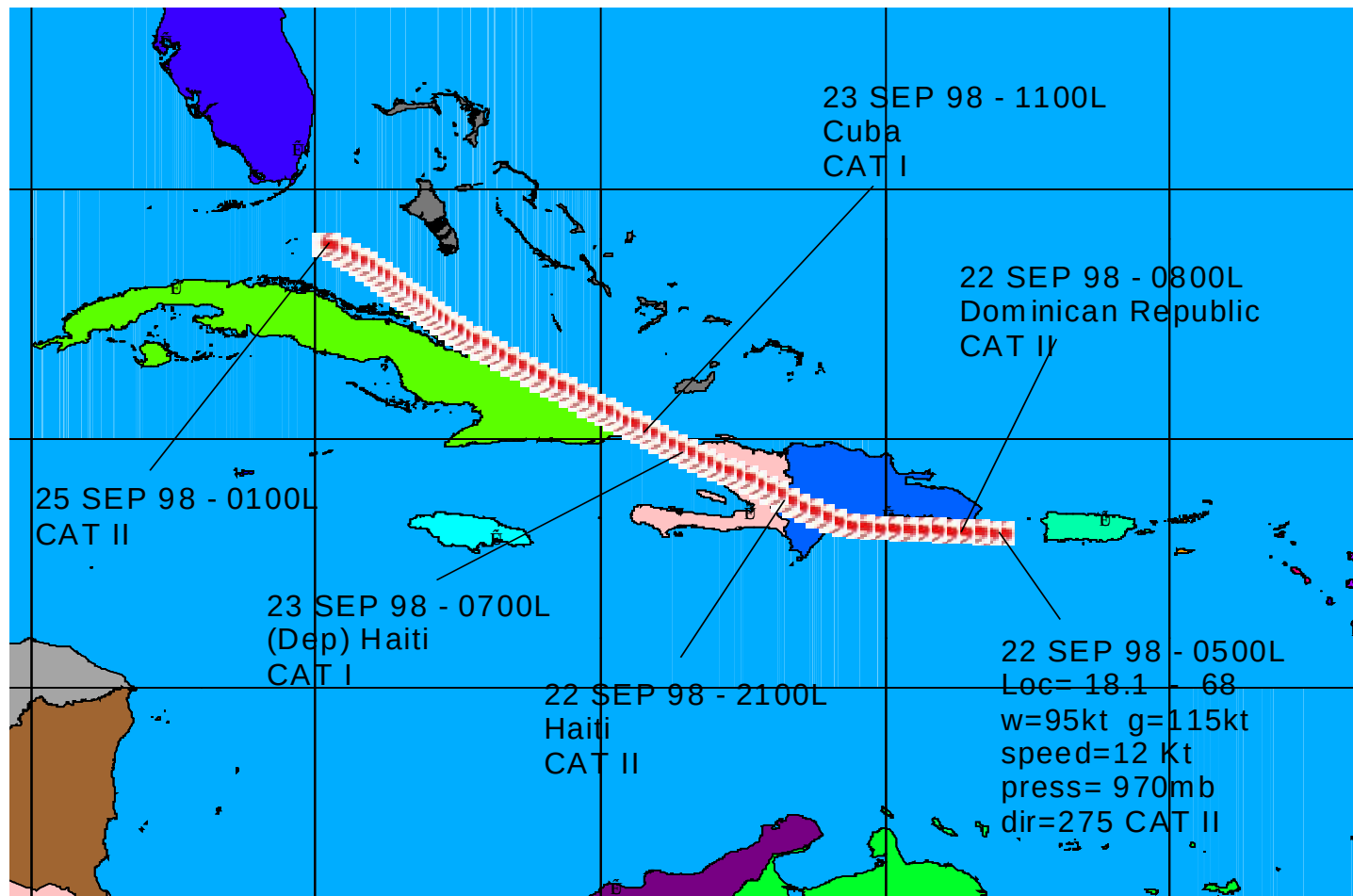
- **Near Real-time Information**
- **Crisis Action Team**
 - **Expected Time Of Hurricane Over Population Centers**
 - **Expected Damage (Graphically)**
- **OPG**
 - **Closest Relief Sites To The Damage Area**
 - **Determine Size Of JTF**
 - **Forecast Relief Supplies Needed**
- **Alert MILGP - Prepare Request For Assistance**

CATS



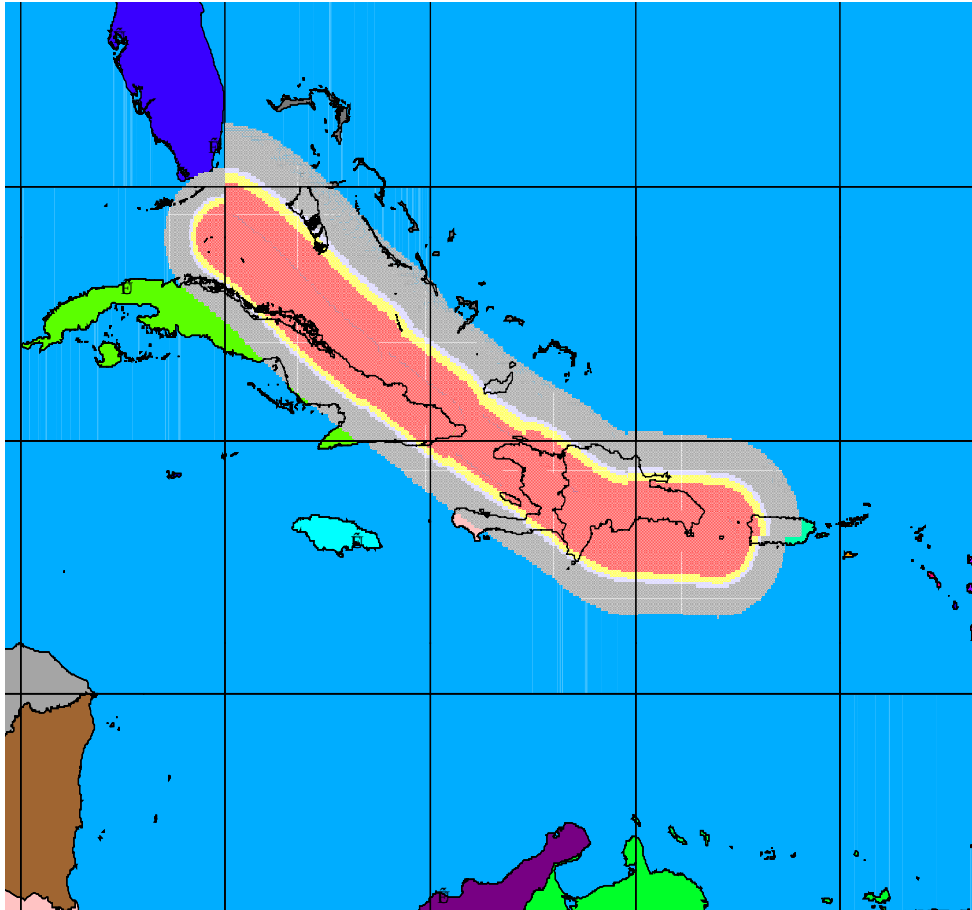
- **Hurricane Georges**
- **Hurricane Mitch**
- **Blue Advance 98**
- **Other**

Hurricane Georges (Track #28)



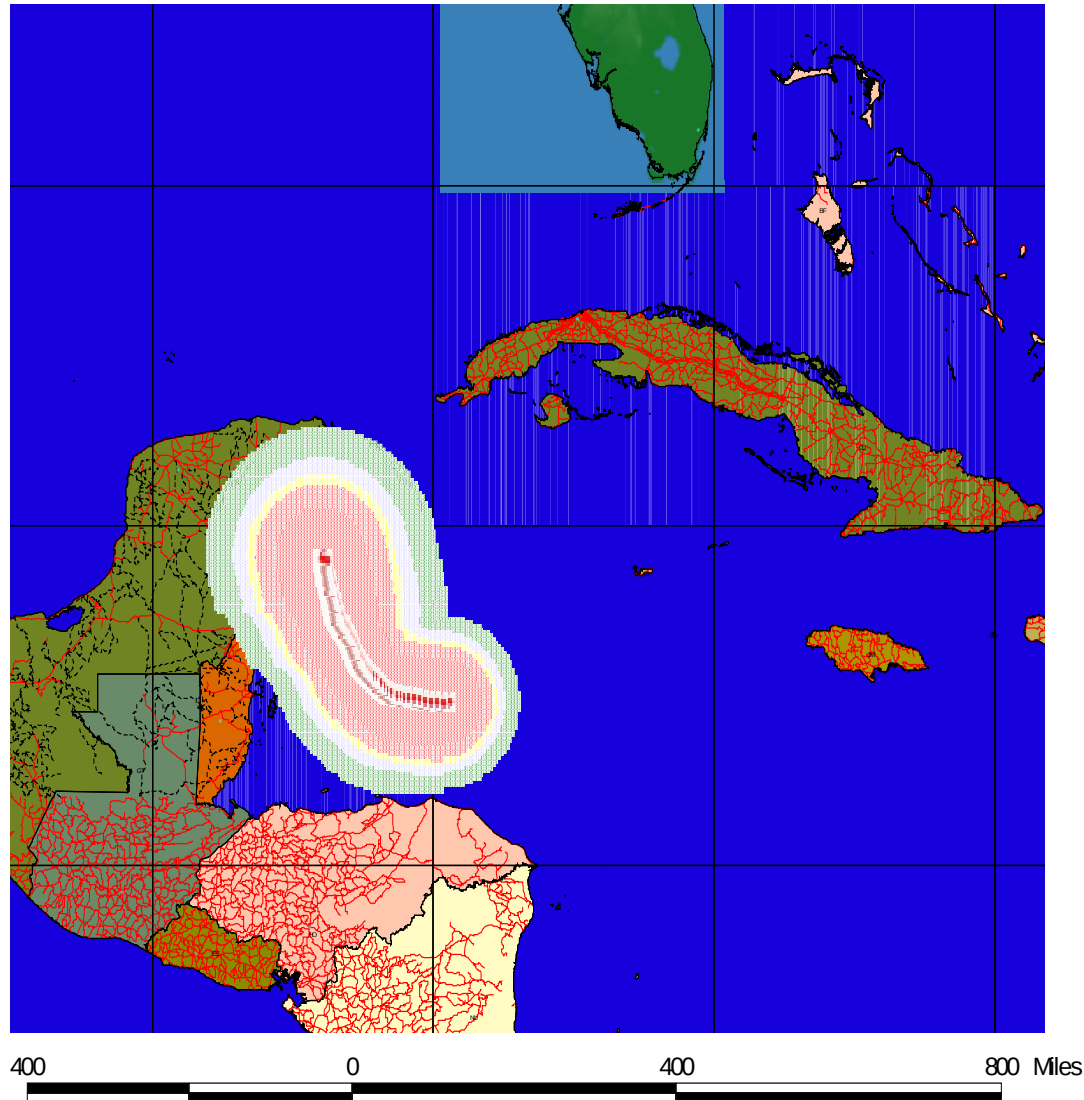
All Times Are Local

Projected Affected Population



	<u>Displaced</u>
Haiti	3,305,494
Dom Rep	3,899,398
Puerto Rico	1,880,321
Virgin Islands	57,627
Antigua/Barbuda	42,997
<i>Total:</i>	9,185,837

HURRICANE MITCH



0900Z 27 OCT 98
WS=155KT GUSTS=185KT

LOC= 17.4N 84.8W
SPEED 7KT DIR 270 DEGREES

CATS



- **Strengths Of Model**
 - Graphical Display Of Data
 - Intervals Of Information
 - Display Of Relief Centers Compared To Disaster Site
 - Tied To Real Time Weather Data
- **Weaknesses Of Model**
 - No Water Damage Or Surge Module
- **Challenges Of Employment/Operations**
 - Exploit Model's Potential (Getting Ahead Of Disaster Onset Prevent vs Rehabilitate, Push vs Pull Of Relief Supplies)
 - Unavailability Of Infrastructure Databases

Joint Conflict And Tactical Simulation Model (JCATS)



- **Joint (Air/Land/Sea), Multisided, Entity level, High Resolution Model**
- **Effective Tool For Training, Analysis, and Mission Planning and Rehearsal**
- **Decision Maker Can “See” The Scenario and Run Possible Alternatives (Courses Of Action)**
- **Developed by Lawrence Livermore National Laboratory**

JCATS



- **Real World And Training Support Analysis**
 - **Blue Advance 99**
 - **PKO South 99**
 - **Real World NEO And CT Operations**

JCATS



- **Advantages**
 - **Allows Detailed Modeling Of Small Group Tactics In Rural And Urban Terrain**
 - **Dynamic Aggregation/De-Aggregation Of Units During The Exercise**
 - **Multi-sided, Including “Grey” (Civilian Factions)**
 - **Detailed Line Of Site Calculations At Entity level**
- **Disadvantages**
 - **Data Bases Built By Hand**
 - **Requires Addition Of Civil Affairs Module**
- **Challenges of Employment/Operations**
 - **Unavailability Of Data Bases**
 - **Lack Of Infrastructure Data Bases**
 - **Asset Intensive**
 - **Linkage Of JCATS To Civil Affairs Module**

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Deployable Exercise System (DEXES)



- **Models The Impact Of MOOTW On:**
 - **Political Variables**
 - **Economic Variables**
 - **Socio-cultural Variables**
 - **Public Health Variables**
- **Adaptable For**
 - **Country**
 - **Group Of Countries**
 - **Region**
 - **Political Faction**
- **Developed For USSOUTHCOM By Corrales Software Inc.**

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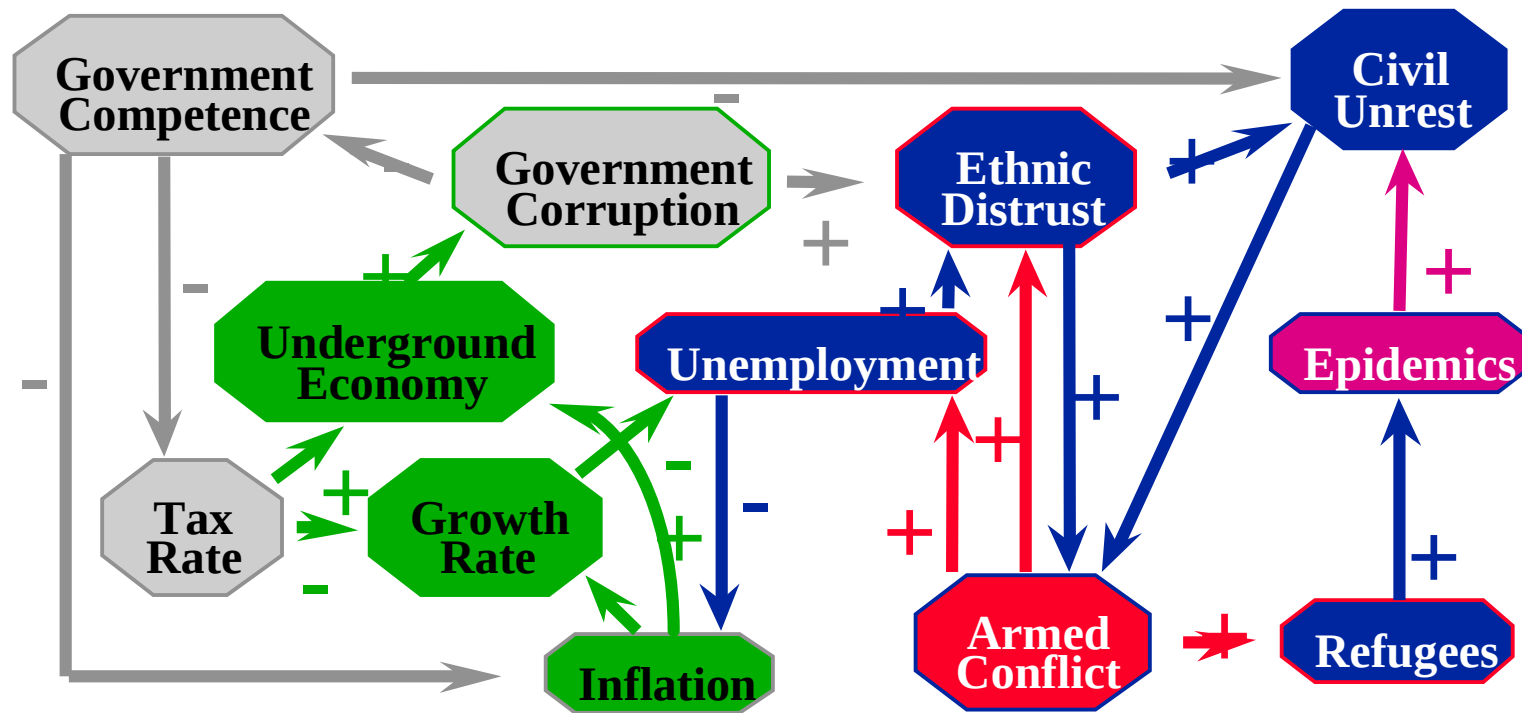
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DEXES



- **Training Support And Analysis**
 - **PKO South 99**
 - **FAHum 99**

DEXES



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DEXES

EVENTS FLOW

CONTROL GROUP

DIRECTOR & SNR
ROLE PLAYER

OPERATIONS
CELL

DEXES
TIME JUMP

TRAINING AUDIENCE

UN FORCE, BRIGADE &
BATAILLION HQTRS

EXECUTE ASSIGNED TASKS

CONTROLLERS
ROLE PLAYERS

JCATS

EVENTS

INTERACTION

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DEXES



- **Strengths of Model:**
 - **Developed For USSOUTHCOM (Meets Our Needs)**
 - **Quick Turn Around**
- **Weaknesses Of Model:**
 - **Macintosh Based**
 - **Requires Intensive Train-up**
 - **Model Adjustments Require Extensive Expertise**
- **Challenges Of Employment/Findings:**
 - **Obtaining Current Data On Trends/Status/Effects**
 - **Applicability To Other Analysis Requirements**

NATIONLAB



- **Real World Engagement And Training Support/Analysis**
- **Customized Model Using COTS STELLA Software**
- **Modeling, Simulation & Analysis (MS&A) Of Poverty, Corruption, And Narcotrafficking In Bolivia**
- **A Collaborative US-Bolivian Project**
- **Stella Software Marketed By High Performance Systems Inc.**

NATIONLAB



- **Identify Actions That Government Of Bolivia (GOB) Could Pursue To Attack And Disrupt The Vicious Cycle Among Poverty, Corruption, And Narcotrafficking In Their Country, Based On The MS&A Results.**

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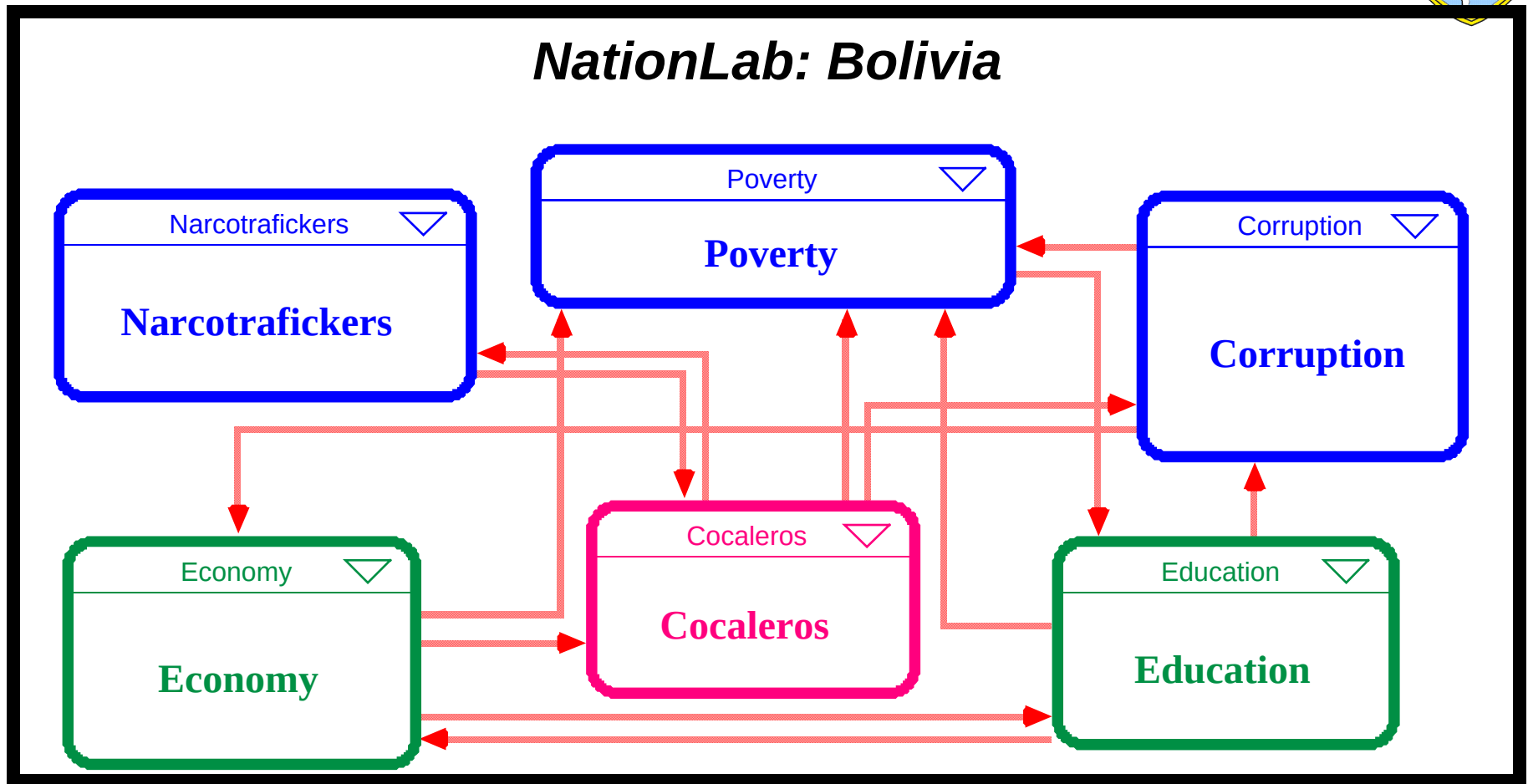


- **Three Phases:**
 - **Initial Model Development And Refinement**
 - **Model Refinement And Database Preparation**
 - **Analysis Of Actions**

NATIONLAB



NationLab: Bolivia



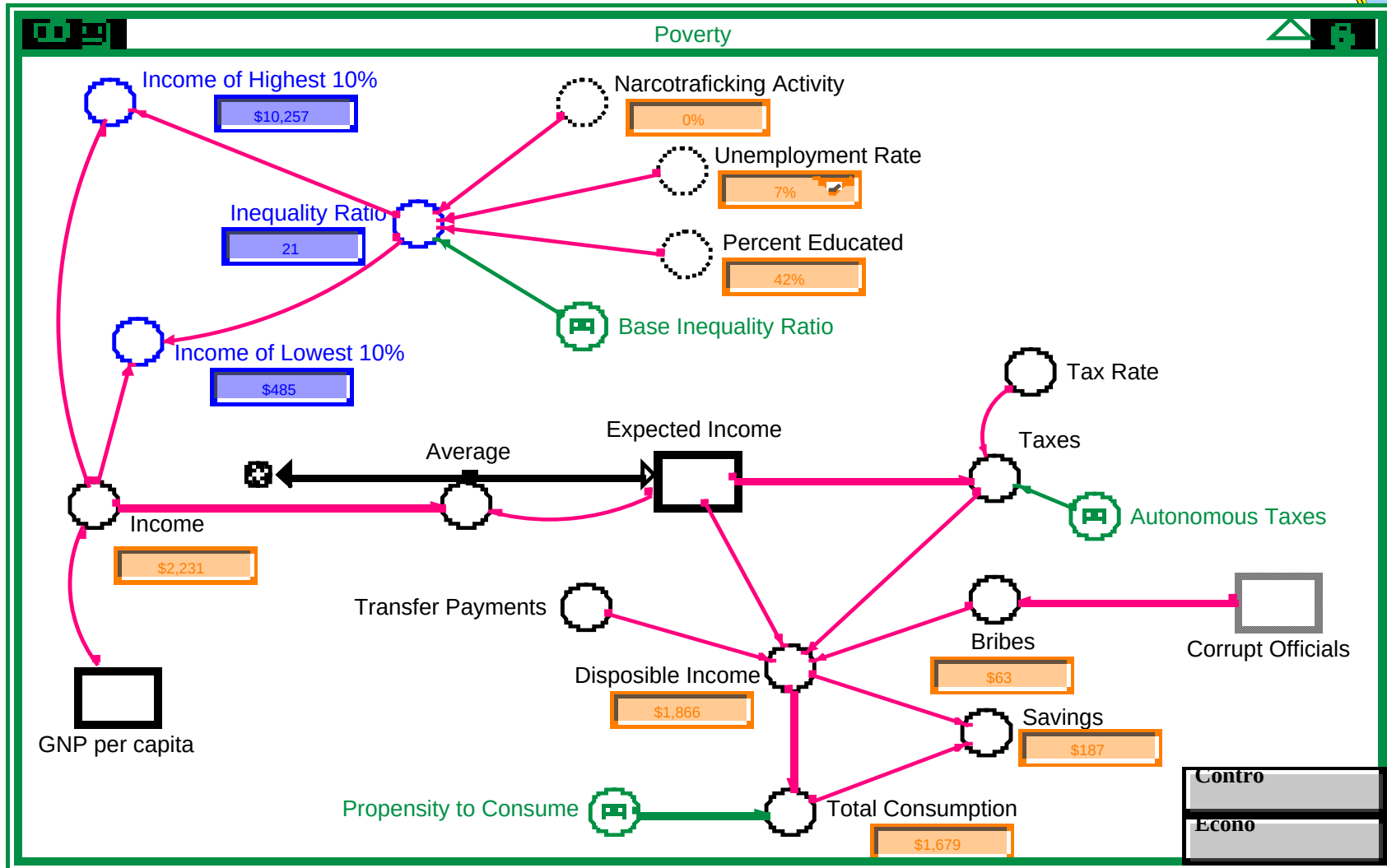
Loren Cobb, 1998

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- **Strengths Of Model:**
 - Graphically Displays Cause And Effect Over Time
 - Quick Turn Around (Rapid Prototyping Of Conceptual Models)
 - COTS Software - Stella
- **Weaknesses Of Model:**
 - Requires Intensive Train-up
 - Requires Extensive Mathematical Background
- **Challenges Of Employment/Findings:**
 - Obtaining Current Data On Trends/Status/Effects
 - Applicability To Other Analysis Requirements

The Way Ahead



- **Possess A “Tool Box” Of Automated Analytical And Decision Support Applications, And A Staff Of Trained Experienced Analysts Capable Of Providing CINC And Senior Staff With Timely, Credible, User-friendly Information To Support Decision-making And Situation Awareness**
- **Continue Engagements With NATIONLAB**
- **Remain A Key And Essential Element Of The SOUTHCOM Planning Process**

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ISSUES



- **JWARS -- No Utility To USSOUTHCOM**
 - Not Entity Level
 - Low Resolution
 - Conventional “Cold War”-Fighting Vs Contemporary SSC/MOOTW
- **JSIMS -- No Utility To USSOUTHCOM**
 - Minimal MOOTW, SOF, Or MOUT Capabilities
 - “Cold War” Fighting Vs Contemporary Mil Ops
 - Limited Support To Operational Analysis
 - No Rehearsal Capability
 - USSOUTHCOM AOR Last In Data Base And Scenario Build Priority
- **Unavailability Of Infrastructure Data Bases Will Persist**

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Miami, Florida

SCJ5-PAS Modeling, Simulation, and Analysis Support To USSOUTHCOM

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Overall Classification Of
This Briefing:
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