

**West Coast** 

Region

### NMFS Biological Opinion Draft Analytical Approach for Salmonids and Sturgeon

Reinitiation of Consultation on the Coordinated Long-Term Operations of the CVP/SWP April 15, 2019

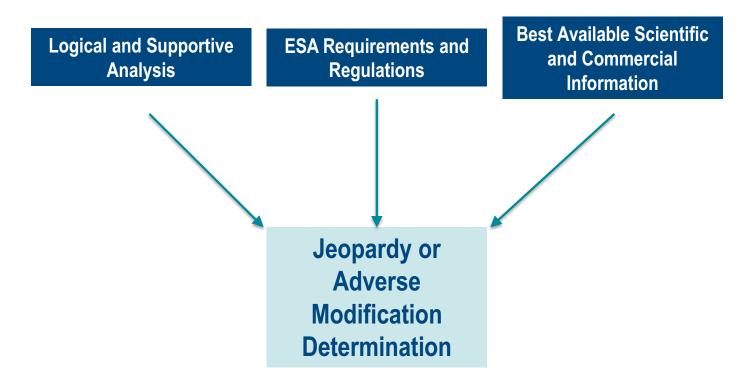
### **Objectives of Analytical Approach**

- To "jeopardize the continued existence of a listed species" is "to engage in an action that would be expected, directly or indirectly, to *reduce appreciably the likelihood of both the survival and recovery* of a listed species in the wild by reducing the *reproduction*, numbers, or distribution of that species" (50 CFR 402.02)
- Destruction or adverse modification "means a direct or indirect alteration that *appreciably diminishes* the value of critical habitat for the conservation of a listed species. Such alterations may include, but are not limited to, those that alter the *physical or biological features* essential to the conservation of a species or that *preclude or significantly delay* development of such features" (81 FR 7214; February 11, 2016)

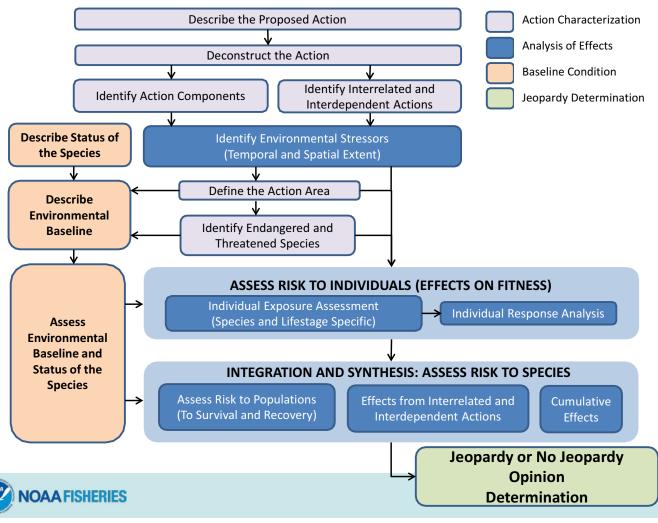
Jeopardy or Adverse Modification Determination



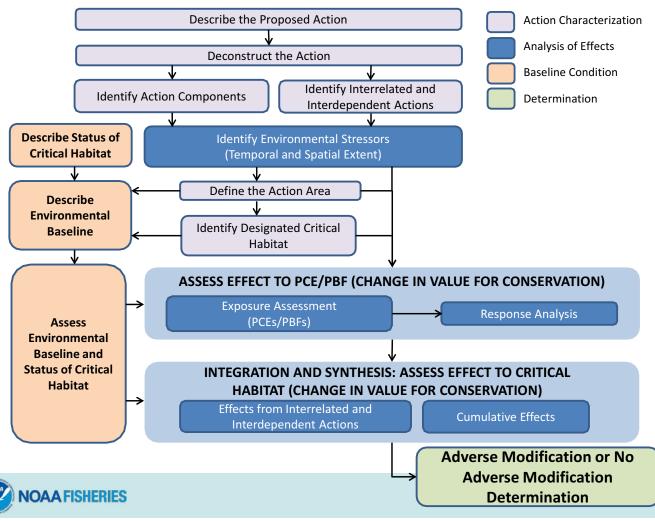
## **Objectives of Analytical Approach**

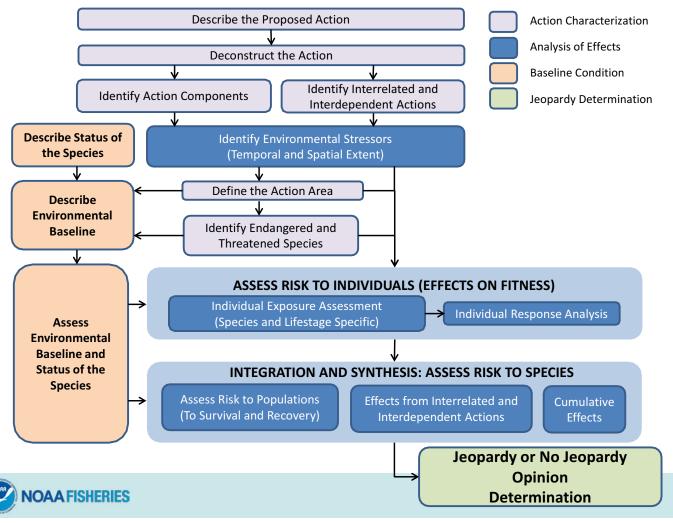


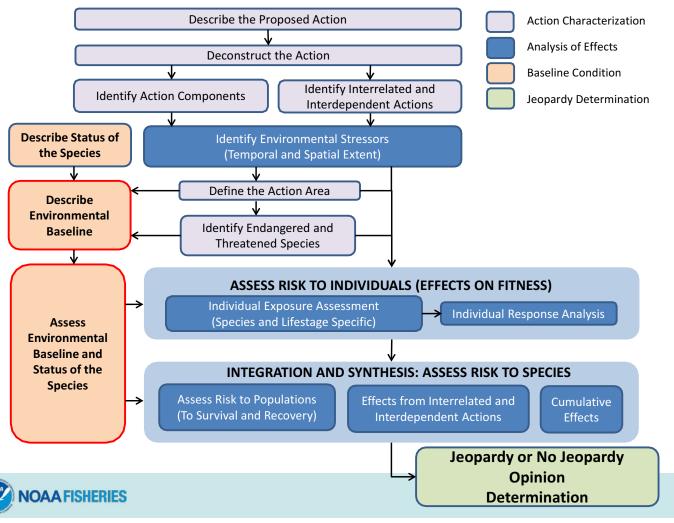




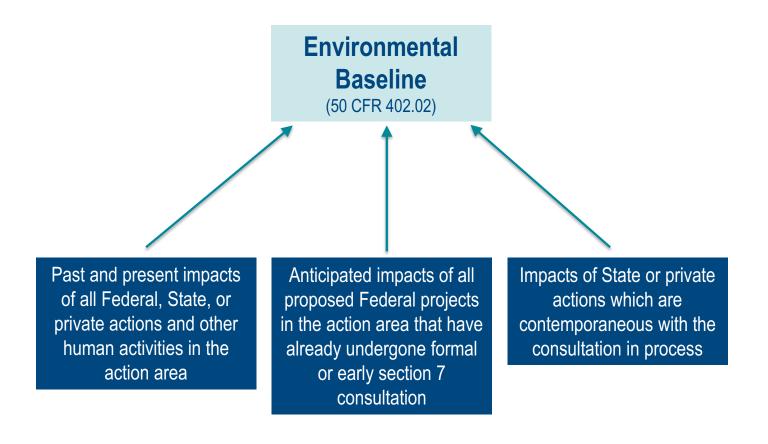
## **General Approach Model (Critical Habitat)**







### **Environmental Baseline**





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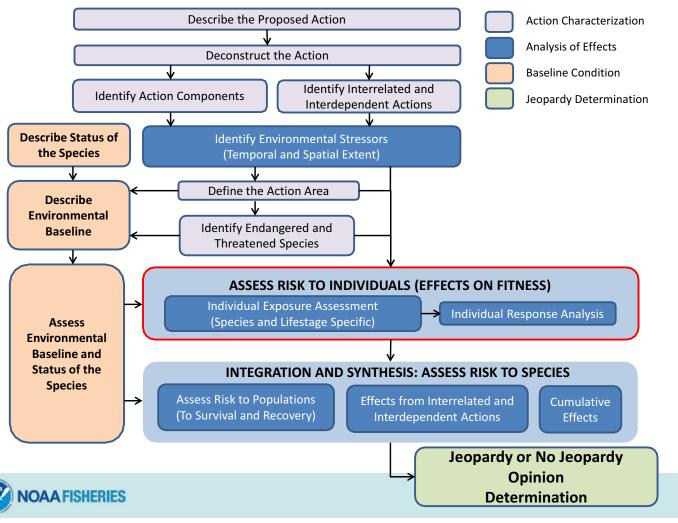
Past and Present CVP/SWP Effects of the 2019 CVP/SWP ROC PA **Operations** proposed action Past Habitat Actions Undertaken or Completed Under 2009 CVP/SWP RPA **Future component of Environmental** the environmental baseline pre-**Human Impacts** baseline to which we consultation Presence of CVP/SWP facilities (e.g., dams, reservoirs) add the effects of the Non-CVP/SWP Operations proposed action Non-CVP Beneficial Actions (e.g. EcoRestore, Sac San upgrade) (future baseline) **Environmental Variations and Climate Change** Date of → FUTURE **PAST** consultation Figure does not denote "Effects of the action" Direct and indirect effects of the proposed action

Effects of interrelated or interdependent activities

"...added to the environmental baseline" (50 CFR 402.02)

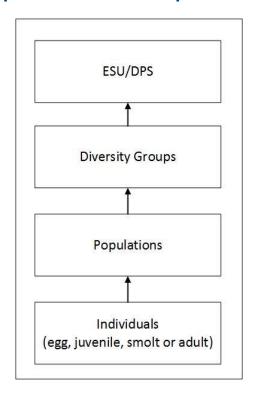
relative intensity of effect or whether impacts are positive or negative; temporal variability of effect/impact is not depicted.





### **Application of Approach to Species - Individuals**

Species risk depends on response of individuals





### **Application of Approach to Species - Individuals**

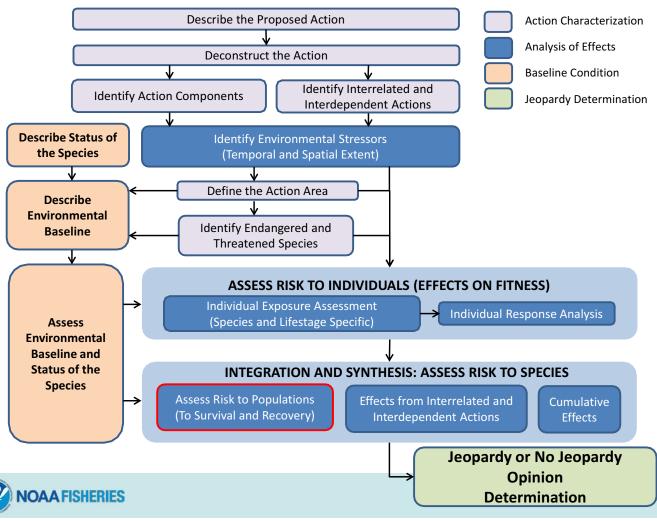
- · "Exposure-response-risk"
- Risk = exposure + response
- Fitness metrics
  - · Growth rate
  - Survival probability
  - · Reproductive success



### **Application of Approach to Species - Individuals**

Stressor	Life Stage (Location)	Life Stage Timing (Work Window Intersection)	Individual Response and Rationale of Effect	Severity of Stressor	Proportion of Population Exposed	Frequency of Exposure	Magnitude of Effect	Weight of Evidence	Probable Change in Fitness
Contaminants due to In- Water Operation of Construction Equipment	Adults, juveniles (central Delta)	January - July	Adverse physiological effects from the long-term risk of exposure to contaminants from spills or disturbance of contaminated sediments/soils	Sublethal	Medium	High	Medium	Medium	Potential for reduced survival growth, and reproductive success





### **Application of Approach to Species - Populations**

- Population risk given baseline condition
- To "jeopardize the continued existence of a listed species" is "to engage in an action that would be expected, directly or indirectly, to *reduce appreciably the likelihood of both the survival and recovery* of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species" (50 CFR 402.02)



### **Application of Approach to Species - Populations**

#### Viable Salmonid Populations

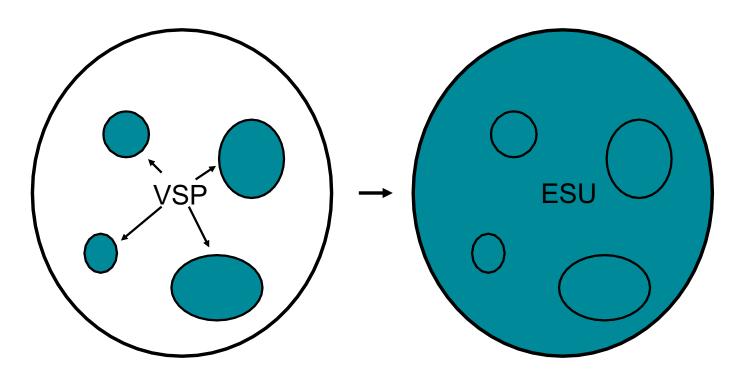
- Abundance
- Productivity
- Spatial Structure
- Diversity and Habitat Capacity

#### Jeopardy Standard

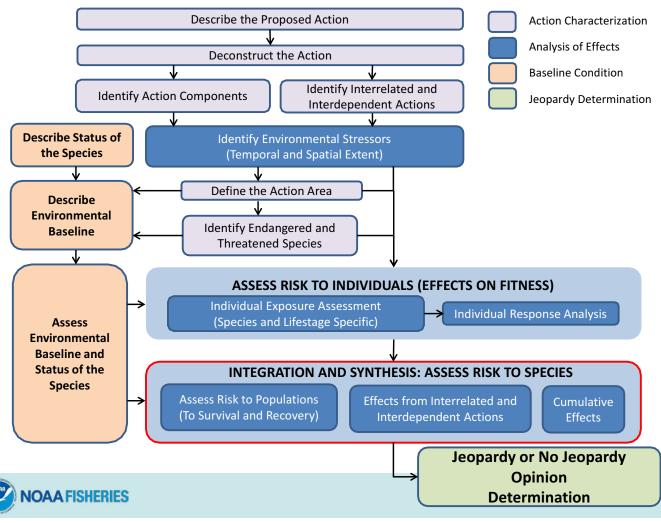
- = Numbers
- = Reproduction
- = Distribution
- Numbers, Reproduction and Distribution

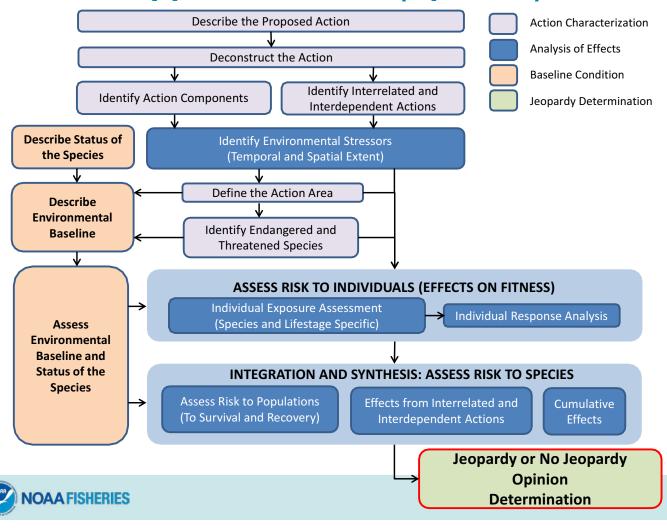


## Measure extinction risk in terms of: Viability of populations within the ESU $\rightarrow$ Viability of the ESU







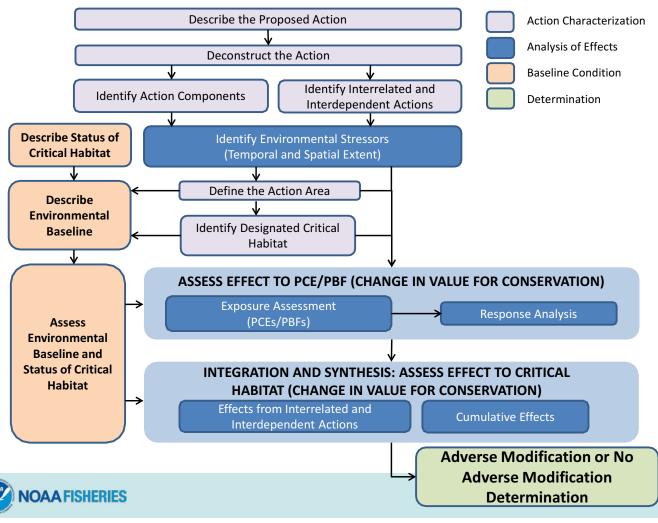


## **Jeopardy or No Jeopardy Determination**

Step	Apply the Available Evidence to Determine if…	True/False	Action
Α	The proposed action is not likely to produce stressors that have direct	True	End
	or indirect adverse consequences on the environment	False	Go to B
В	Listed individuals are not likely to be exposed to one or more of those stressors or one or more of the direct or indirect consequences of the	True	NLAA
	proposed action	False	Go to C
С	Listed individuals are not likely to respond upon being exposed to one	True	NLAA
· ·	or more of the stressors produced by the proposed action	False	Go to D
D	Any responses are not likely to constitute "take" or reduce the fitness of	True	NLAA
	the individuals that have been exposed.	False	Go to E
E	Any reductions in individual fitness are not likely to reduce the viability of the populations those individuals represent.	True	LAA, but NLJ
	or the populations those maintagaic reproduit.	False	Go to F
F	Any reductions in the viability of the exposed populations are not likely	True	LAA, but
	to reduce the viability of the species.		NLJ
	to roduce the viability of the species.	False	LJ

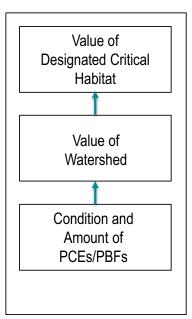


## **General Approach Model (Critical Habitat)**



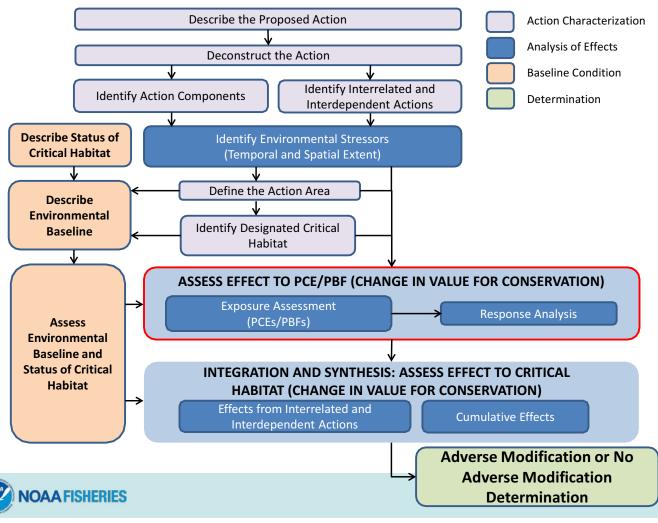
### **Application of Approach to Critical Habitat**

Conservation value of habitat depends on condition of components





## **General Approach Model (Critical Habitat)**



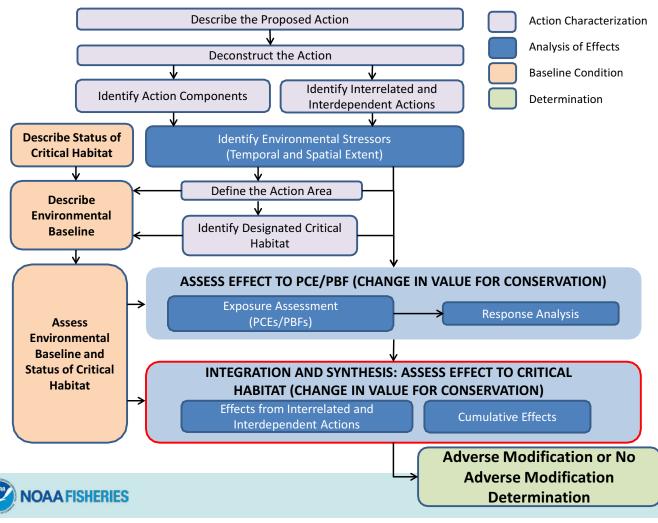
### **Application of Approach to Critical Habitat**

- · "Exposure-response-risk"
- Effects to PCE/PBF
  - · Quality
  - Quantity
  - · Potential/Capacity

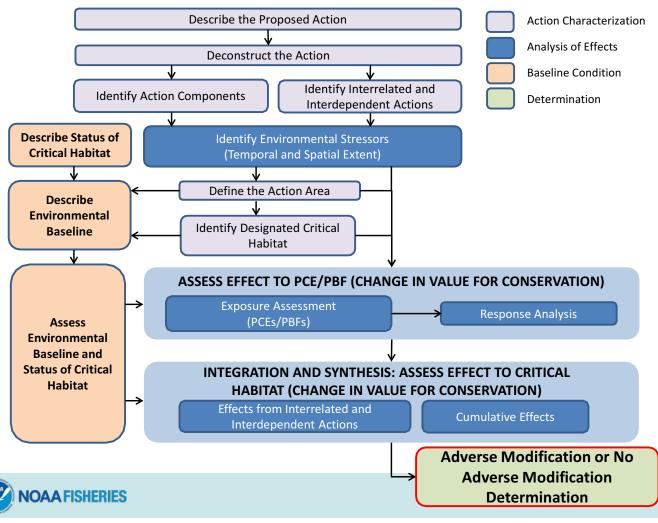
Action Component	Location of Effect	PCEs/Physical and Biological Features Affected	Response and Rationale of Effect	Magnitude of Effect (High, Medium, Low)	Weight of Evidence (High, Medium, Low)	Probable Change in Conservation Value
In-water operation of construction equipment	Within designated CH	Freshwater rearing habitat	Elevated turbidity and suspended sediment degrades water quality and food- producing areas	Medium	Medium	Negative



## **General Approach Model (Critical Habitat)**



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### **Application of Approach to Critical Habitat**

- Based on critical habitat as a whole
- Small impacts can appreciably diminish the value for conservation



# **Application of Approach to Critical Habitat - Determination**

Step	Apply the Available Evidence to Determine if	True/False	Action
Α	The proposed action is not likely to produce stressors that have direct or indirect adverse consequences on the environment.	True	End Co to D
В	Areas of designated critical habitat are not likely to be exposed to one or more of those stressors or one or more of the direct or indirect consequences of the proposed action	False True	Go to B
В		False	Go to C
С	The quantity or quality of any physical or biological features or primary constituent elements of critical habitat or capacity of that habitat to develop those features over time are not likely to be	True	NLAA
	reduced upon being exposed to one or more of the stressors produced by the proposed action	False	Go to D
D	Any reductions in the quantity or quality of one or more physical or biological features or primary constituent elements of critical habitat or capacity of that habitat to develop those	True	NLAA
	features over time are not likely to reduce the value of critical habitat for the conservation of the species in the exposed area.	False	Go to E
E	Any reductions in the value of critical habitat for the conservation of the species in the exposed	True	LAA, but No D/AD
	area of critical habitat are not likely to appreciably diminish the overall value of critical habitat for the conservation of the species.		MOD
		False	D/AD
			MOD



## **Uncertainty and Analytical Methods**



### **Institutionalized Caution**

- All data, analytical methods, and effects have uncertainty
- Courts have cited Congress' intent in the ESA to give the benefit of the doubt to the species<sup>1</sup>
- NMFS will embrace this principle, which the U.S.
   Supreme Court has called "institutionalized caution"<sup>2</sup>

<sup>1</sup>Conner v. Burford, 848 F.2d 1441, 1454 (9th Cir. 1988), referencing H.R. Conf. Rep. No. 96-697, 96th Cong., 1st Sess. 12, reprinted in 1979 U.S. Code Cong. & Admin. News 2572, 2576

<sup>2</sup>Tennessee Valley Authority v. Hill, 437 U.S. 153, 194 (1978)



### **Primary Analytical Models\***

- · CalSimII
- DSM2-HYDRO
- · HEC-5Q
- · Reclamation Egg Morality Model/SacSalMort
- · SALMOD
- · DPM
- · IOS
- Central Valley Chinook Life Cycle Model
- Temperature-Dependent Egg Mortality Model
- Anderson Egg Mortality Model
- · Floodplain Inundation
- · WUA Analysis
- Perry and Pope STARS Model

\*Subject to Finalization



