



OPEN STAKEHOLDER SESSION: ANIMAL MORTALITY MANAGEMENT BMP EXPERT PANEL

Jeremy Hanson, Virginia Tech
Panel Coordinator
November 28, 2018



Welcome to those joining us via Zoom. PLEASE NOTE WE WILL HAVE THE MEETING ROOM MUTED UNTIL READY TO BEGIN, SO YOU MAY NOT HEAR ANY SOUND UNTIL 1:30PM.

HOUSEKEEPING

Those on Zoom: Can you hear us now?

If not, connect your audio using button in bottom left corner of the Zoom window. Follow the prompts from Zoom to connect from there.

Online participants are muted automatically in Zoom. You can un-mute in the bottom left corner of Zoom when prompted to ask your questions verbally. Please mute when not speaking. I will “mute all” if distractions occur.

You can also type your questions in the chat box. Please use the chat box if you have technical issues (e.g., can't hear anything or a certain speaker).

Those in the room: Welcome! ...Did you mute your cell phone?

Please be mindful of those online or listening to the recording. Please avoid side-chatter and step into the hallway for any phone calls or conversations.

Remember: THIS IS BEING RECORDED.

AGENDA

- Welcome and Introduction
- Panelist Introductions
- Presentations with Q&A
- Discussion
- Adjourn



INTRODUCTIONS

Panel Coordinator

Jeremy Hanson, Virginia Tech

Live and work full-time at the CBP Office in Annapolis, MD



Panel Chair

Douglas Hamilton, Oklahoma State

Associate Professor and Waste Management Specialist

This is his third BMP panel for the CBP



Who we are: Panel membership approved by AgWG + panel support roster

Name	Affiliation	Role
Doug Hamilton, PhD, PE	Oklahoma State University	Panel Chair
Thomas Bass	Montana State University	Panel Member
Amanda Abnee Gumbert, PhD	University of Kentucky	Panel Member
Ernest Hovingh, PhD	Pennsylvania State University	Panel Member
Mark Hutchinson	University of Maine	Panel Member
Teng Teeh Lim, PhD, PE	University of Missouri	Panel Member
Sandra Means, PE	USDA NRCS, East Nat'l Tech Support Center	Panel Member
George “Bud” Malone	Malone Poultry Consulting; University of Delaware Extension (retired)	Panel Member
<i>Panel Support</i>		
<i>Jeremy Hanson</i>	<i>Virginia Tech</i>	<i>Panel Coordinator</i>
<i>Brian Benham</i>	<i>Virginia Tech</i>	<i>VT Principal Investigator</i>
<i>Jeff Sweeney</i>	<i>EPA CBPO</i>	<i>CBPO Modeling Team and Watershed Technical Workgroup rep</i>
<i>Mark Zolandz</i>	<i>EPA Region 3</i>	<i>EPA Region 3 regulatory rep</i>
<i>Loretta Collins</i>	<i>University of Maryland, CBPO</i>	<i>AgWG Coordinator</i>
<i>Mark Dubin</i>	<i>University of Maryland, CBPO</i>	<i>Senior Ag Advisor</i>



PRESENTATIONS

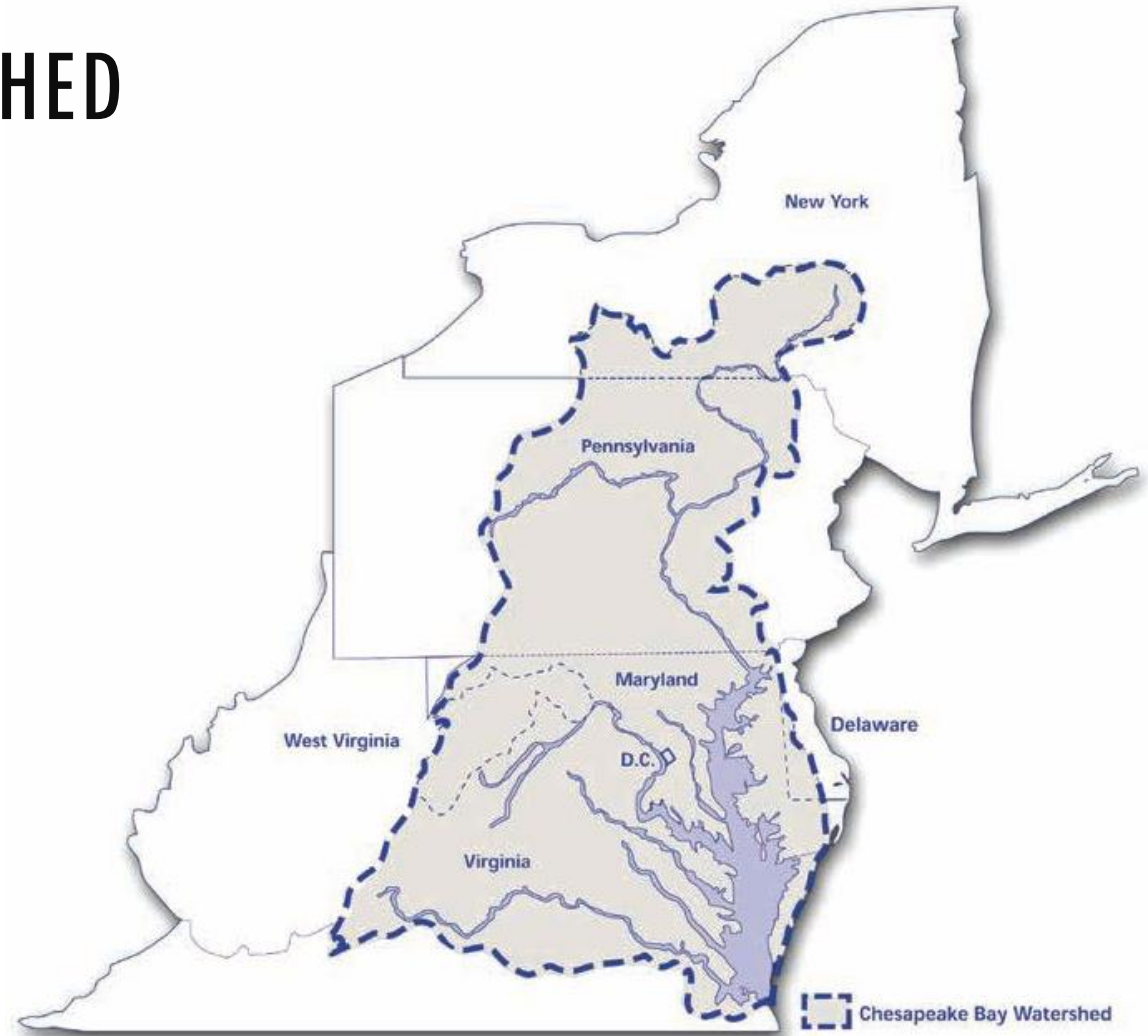


OVERVIEW OF BMP PANEL PROCESS

Jeremy Hanson, Virginia Tech

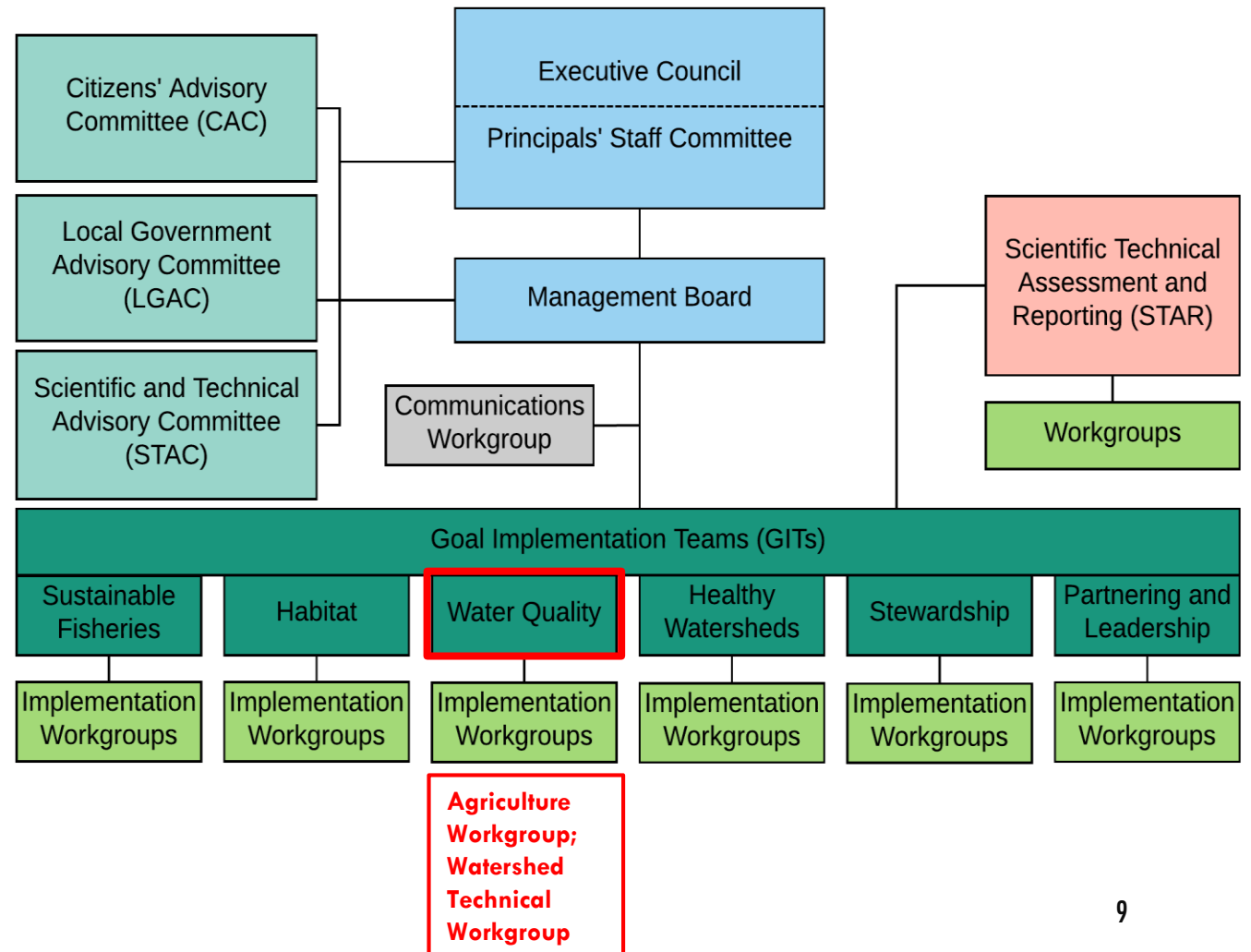
THE CHESAPEAKE BAY WATERSHED

- 64,000 mi²
- Six states and DC
- 58% forested
- 2,700+ species of plants/animals
- Over 18 million residents
- ~77,000 farms
- >10 million animal units (total, all animal types)
- ~1,800 local governments



THE CHESAPEAKE BAY PROGRAM (CBP)

- A science-based partnership of federal, state and academic partners. Plus regional and local gov't entities, NGOs, industry, etc.
- Began in early 1980s, following multi-million dollar study of the Bay ecosystem and eutrophication
- Latest of multiple multi-state agreements signed in 2014 (Watershed Agreement) between MD, VA, PA, DE, NY, WV, District of Columbia, USEPA and Chesapeake Bay Commission



WHAT IS A “BMP EXPERT PANEL”

Best Management Practices (BMPs) are practices or technologies that reduce pollution when implemented or installed.

- Structural, non-structural, programmatic

Expert panels use the best available science and best professional judgment to inform the Chesapeake Bay Program partnership how much a BMP reduces nutrient and sediment pollution

- They write a report with a lot of information in it
- They follow the BMP Protocol (more on this soon...)

The expert panels focus on the water quality benefits – specifically, the nitrogen, phosphorus and sediment reductions – associated with BMPs. They consider ancillary effects, too.



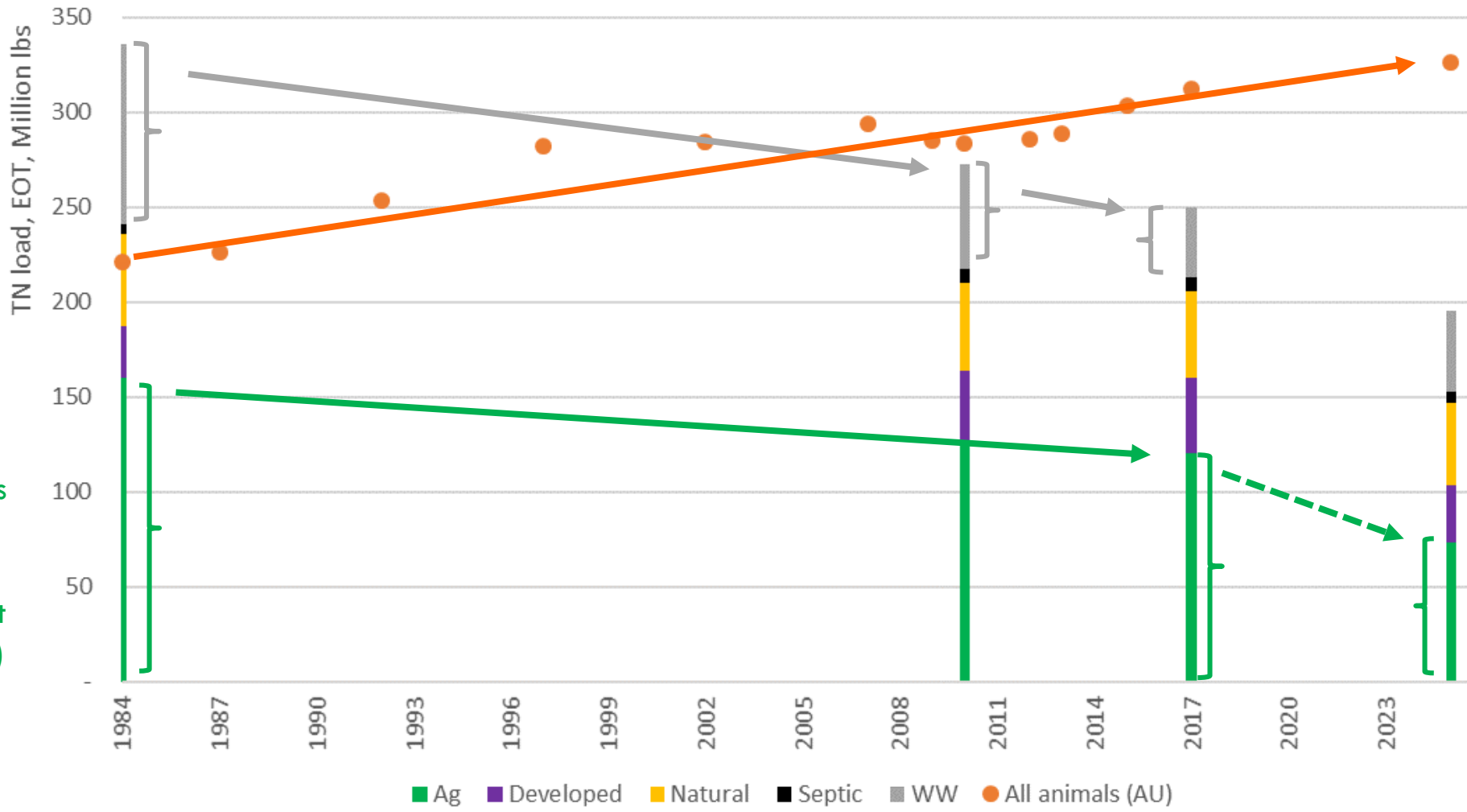
Why care about BMPs?

(photo: NRCS-Virginia)

TN loads by sector (1984, 2010 and 2017 Progress; 2025 WIP2) and animal populations, Chesapeake Bay Watershed

WWTP upgrades have contributed major TN and TP reductions

Agriculture continues to reduce loads (loss of ag land to development plays a role)

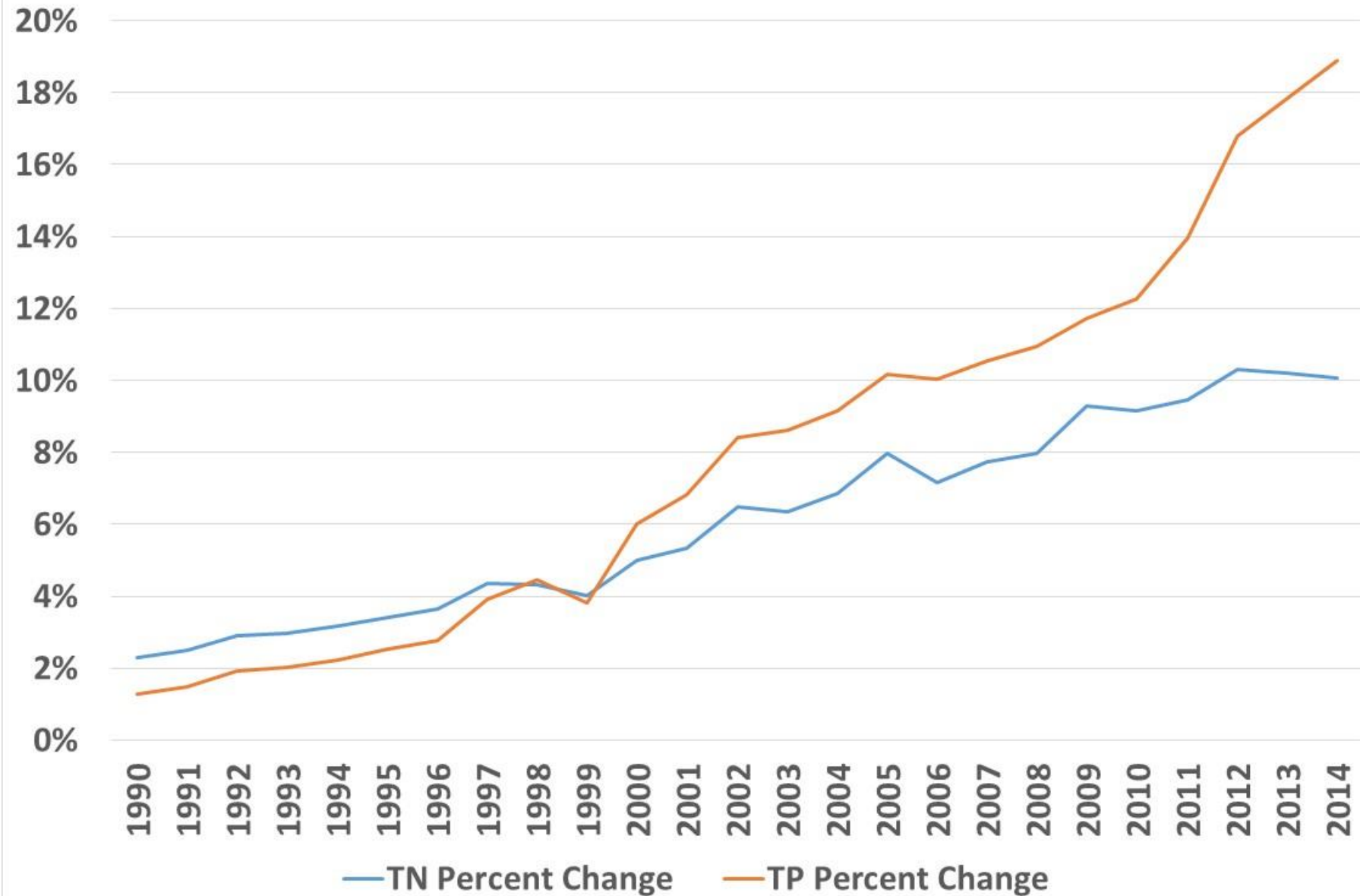


All animals, Millions (AU) Animal populations (in animal units, AU) fluctuate but are expected to increase

Total Maximum Daily Load (TMDL) established in 2010 for Chesapeake Bay sets limits for TN, TP and sediment, with 2025 as the goal to meet those targets. **BMP implementation is how jurisdictions reduce nonpoint source loads.**

Source: CAST. TN loads are edge-of-tide (EOT) for 1984, 2010 and 2017 Progress, 2025 WIP2 scenarios; animal populations from base conditions reports for graphed years, includes all animal types, both permitted and non-permitted

Overall effect of nonpoint source BMPs

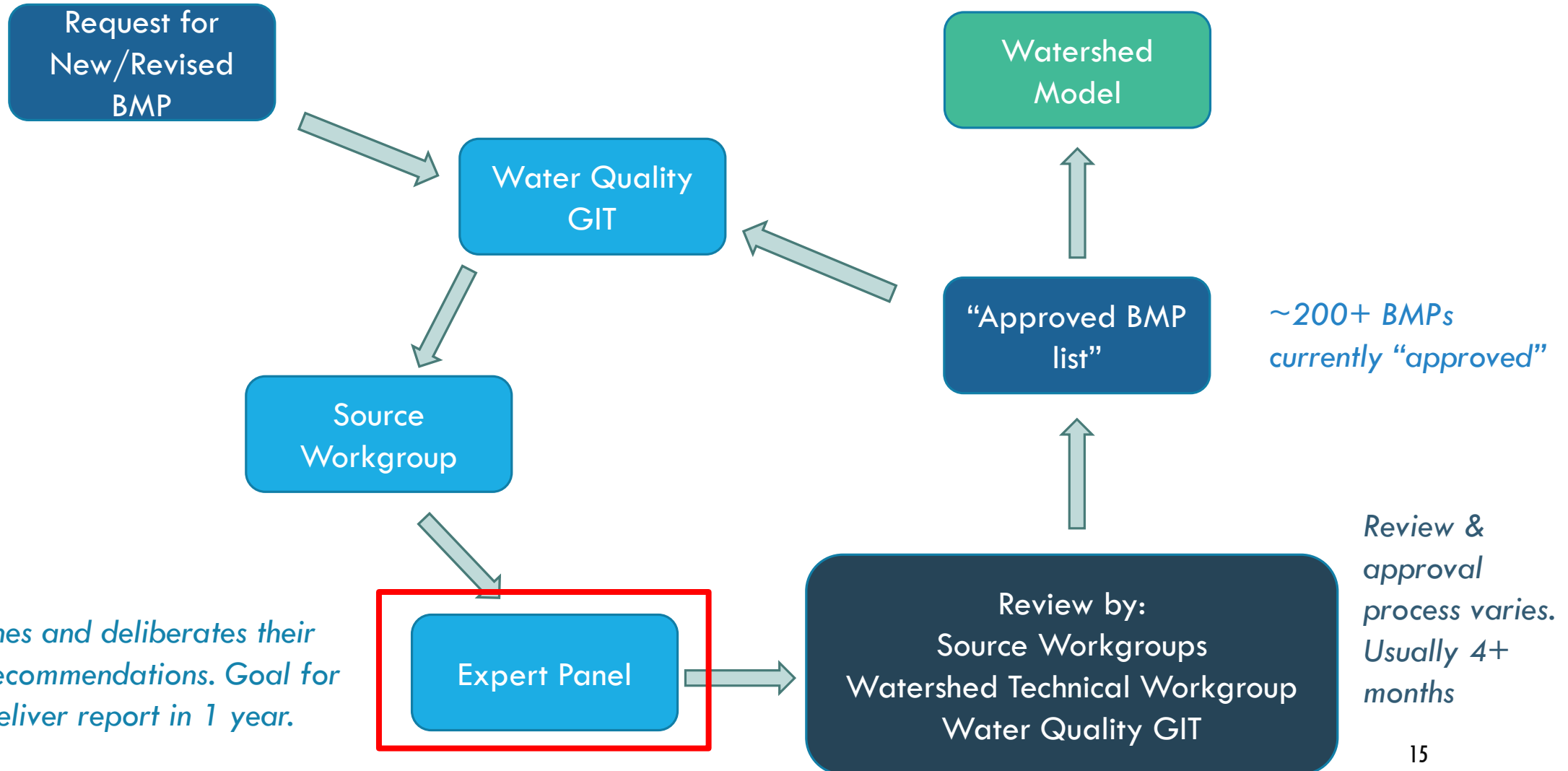




THE PROCESS

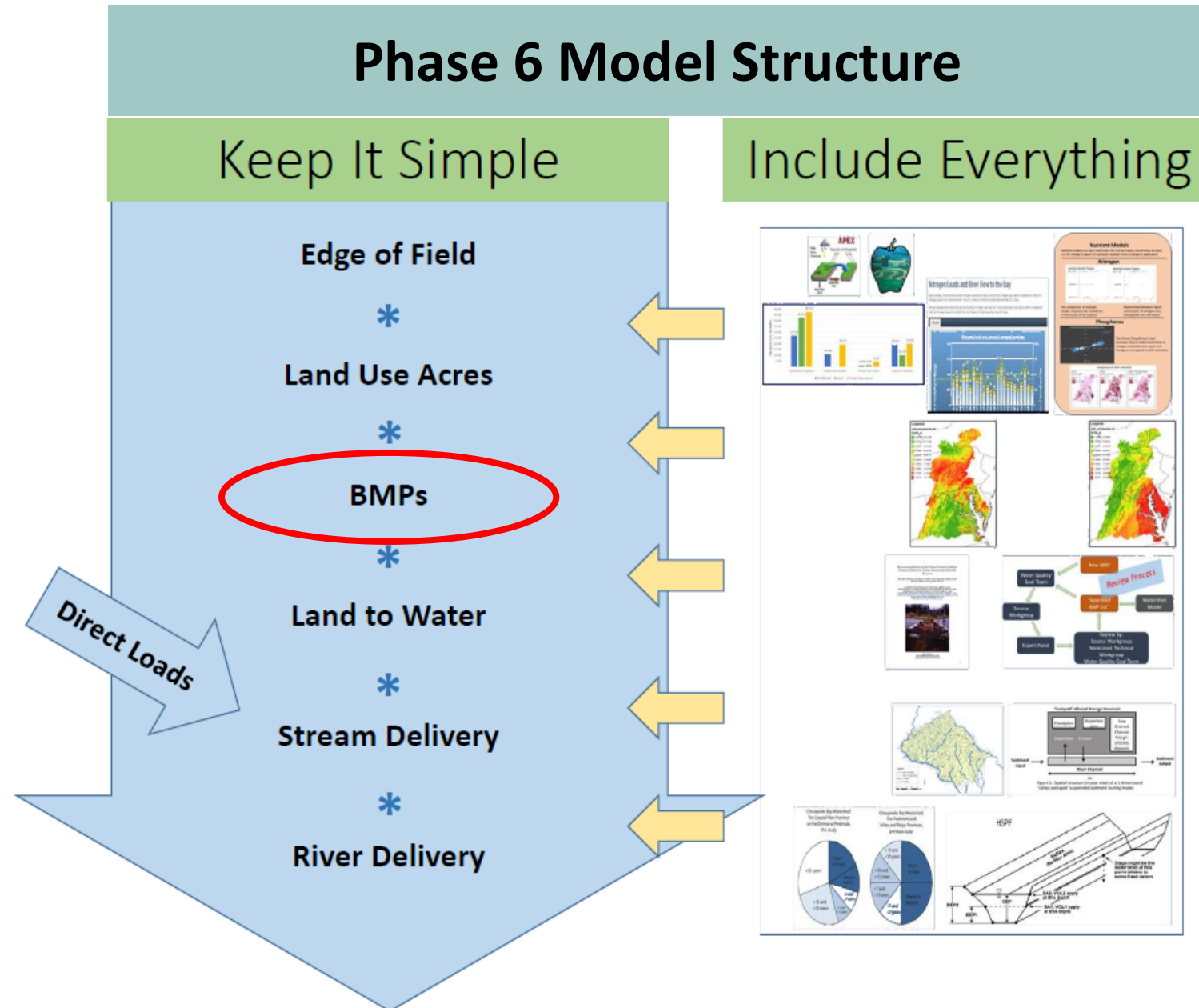


Diagram of Process to add/modify BMPs (BMP Review Protocol)



WHERE PANEL RECOMMENDATIONS GO

- Phase 6 Chesapeake Bay Watershed Model
- It is primarily a management model: what's the change in loads following actions on the ground (BMP implementation)?
- Calibrated to monitoring data and loads (calibration period extends back to 1983)
- Watershed Model feeds into Estuary Model to assess water quality based on N, P and sediment loads



ANIMAL TYPES AND “HOT-SPOTS”

Twelve types in the Watershed Model

Beef

Dairy

Other cattle

Hogs and pigs for breeding

Hogs and pigs for slaughter

Horses

Goats

Sheep and lambs

Broilers

Layers

Pullets

Turkeys

Livestock
(AU, in 2013)

Poultry
(AU, in 2013)

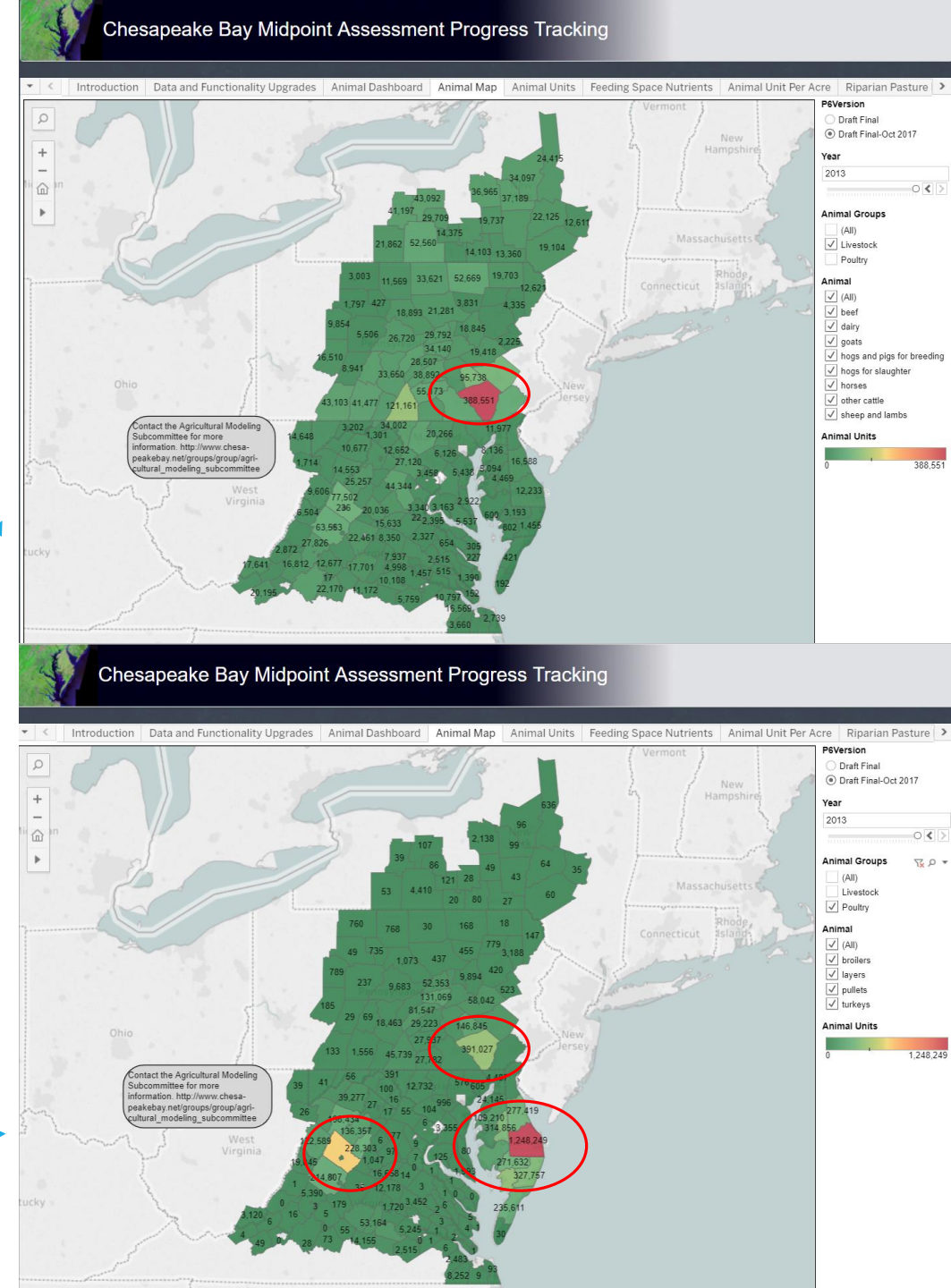


FIG. 3-4. CONCEPTUAL MODEL OF NUTRIENT FATE THROUGH AGRICULTURAL LANDS (PHASE 6)

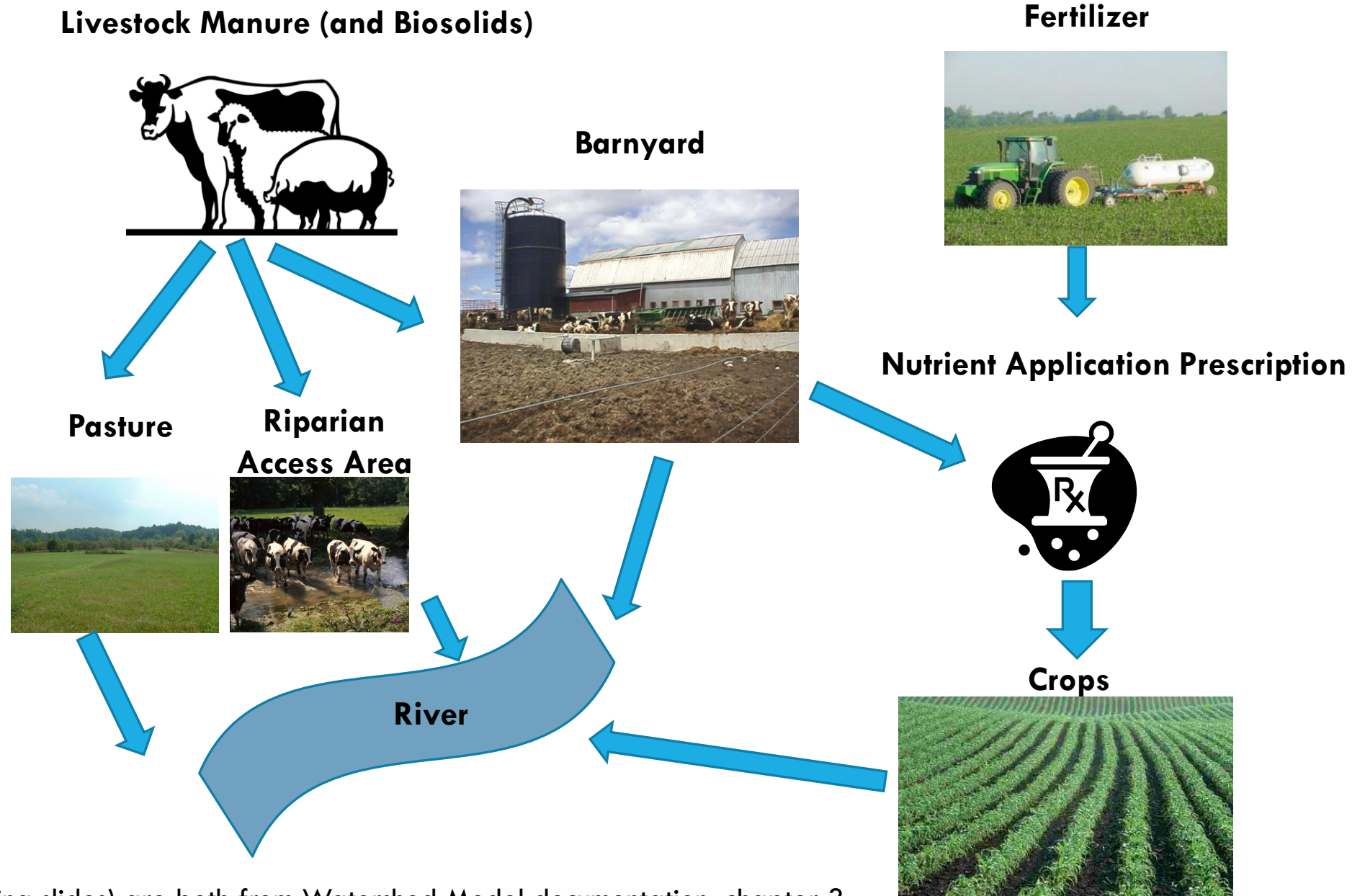
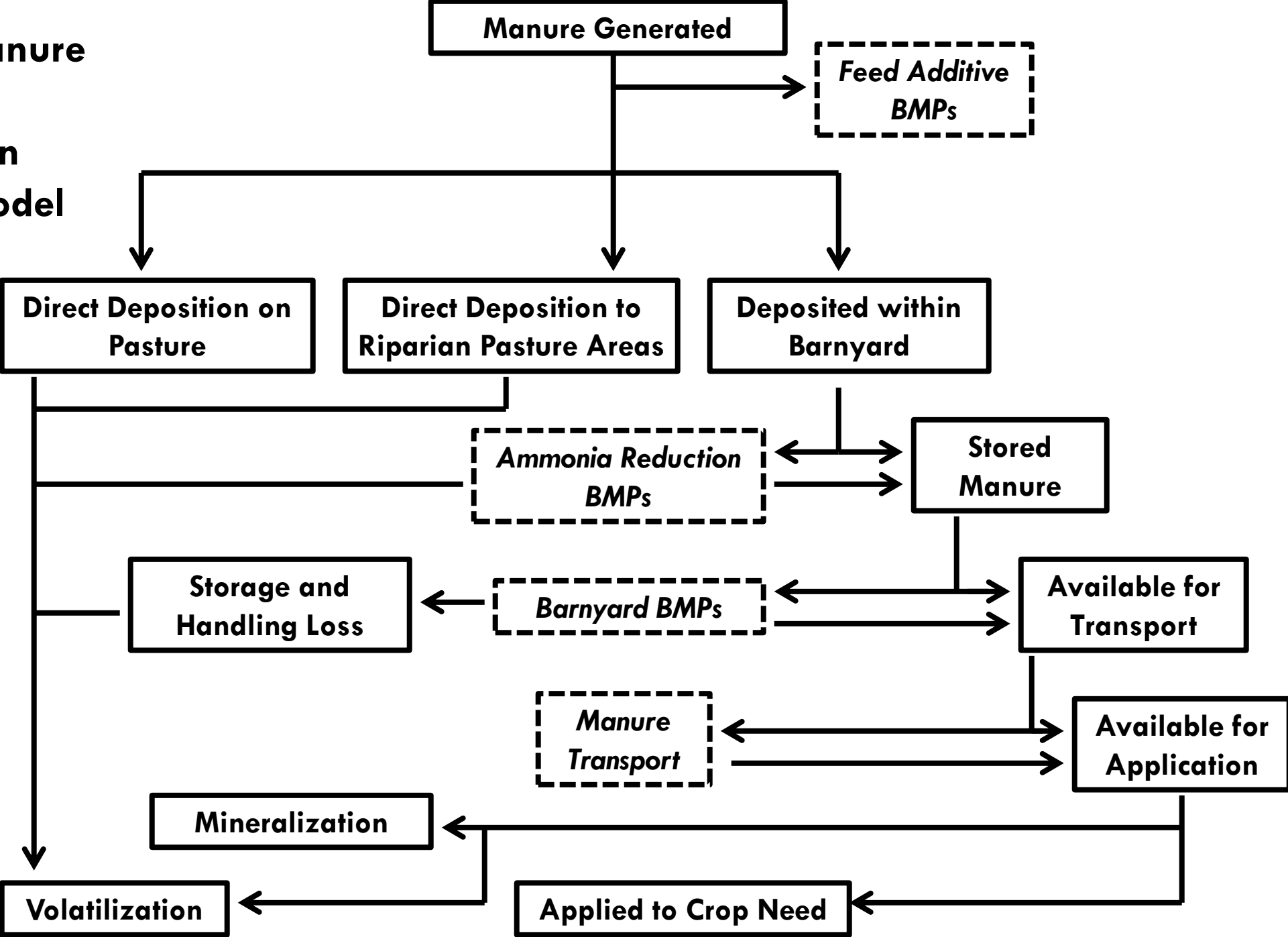


Fig. 3-5 Manure application processes in Phase 6 Model





WHAT'S NEXT? ANIMAL MORTALITY BMP PANEL

Approved by AgWG on Aug. 16

Now in progress!

PANEL CHARGE

- **Primary mission:** Provide Nitrogen and Phosphorus reduction efficiencies for mortality management methods above a benchmark (burial).
- Routine mortality only, not catastrophic
- Management systems of interest:
 - Burial (as a baseline)
 - Mortality Composting (currently CBP-approved BMP)
 - Freezers
 - Incineration or gasification
 - Landfill or rendering
- Primary animal types of interest: poultry, swine
- Secondary animal types of interest: Everything else (beef, dairy, horses, etc.)



DATA NEEDS, FROM AGWG

General Animal Group (defined by EPEG)	BMP Animal Groups	% N per Carcass	% P per Carcass	Mortality %	Avg. Dead weight?	Mortality Management Baseline (1984)	Mortality Management Today**		
Primary Animal Group	Poultry	?	?	?	?	Burial	Burial	Yes	
							Freezer	Yes	
							Compost	Yes	
							Incineration	Yes	
	Swine	?	?	?	?	Burial	Burial	Yes	
							Freezer	Yes [#]	
Compost							Yes		
Incineration							Yes		
Secondary Animal Group	Cattle	?	?	?	?	Burial	Burial	Yes	
							Freezer	No	
							Compost	Yes	
							Incineration	No	
	Equine*	?	?	?	?	?	Burial	Burial	Yes
								Freezer	No
								Compost	Yes
								Incineration	No
	Other? (e.g. Sheep, Goats)	?	?	?	?	?	Burial	Burial	Yes
								Freezer	No
								Compost	Yes
								Incineration	No

* direct-to-rendering also practiced; ** current mortality management as understood by EPEG; # piglets (nursery) only

MORTALITY IN PHASE 6 MODEL

Mortality is implicit in Phase 6 animal populations.

Populations from Ag Census (livestock) and USDA-NASS annual reports (broilers and turkeys) are used directly.

Ag Census populations represent inventory. Inventory implicitly accounts for mortality.

USDA-NASS annual reports represent birds produced. Birds produced implicitly accounts for mortality.

POTENTIAL CREDIT MECHANISMS

Option 1: If panel finds a water quality benefit, that benefit could be added as a % reduction to “feed space” loads in a future milestone period.

Option 2: Ag Workgroup could request a change to the manure calculations from the Water Quality GIT and Modeling Workgroup *in a future version of the Model* if a panel defines:

- % mortality
- nutrients available in carcasses
- water quality benefit, and
- wishes to explicitly account for all of this in the model

Fig. 3-5 Manure application processes in Phase 6 Model

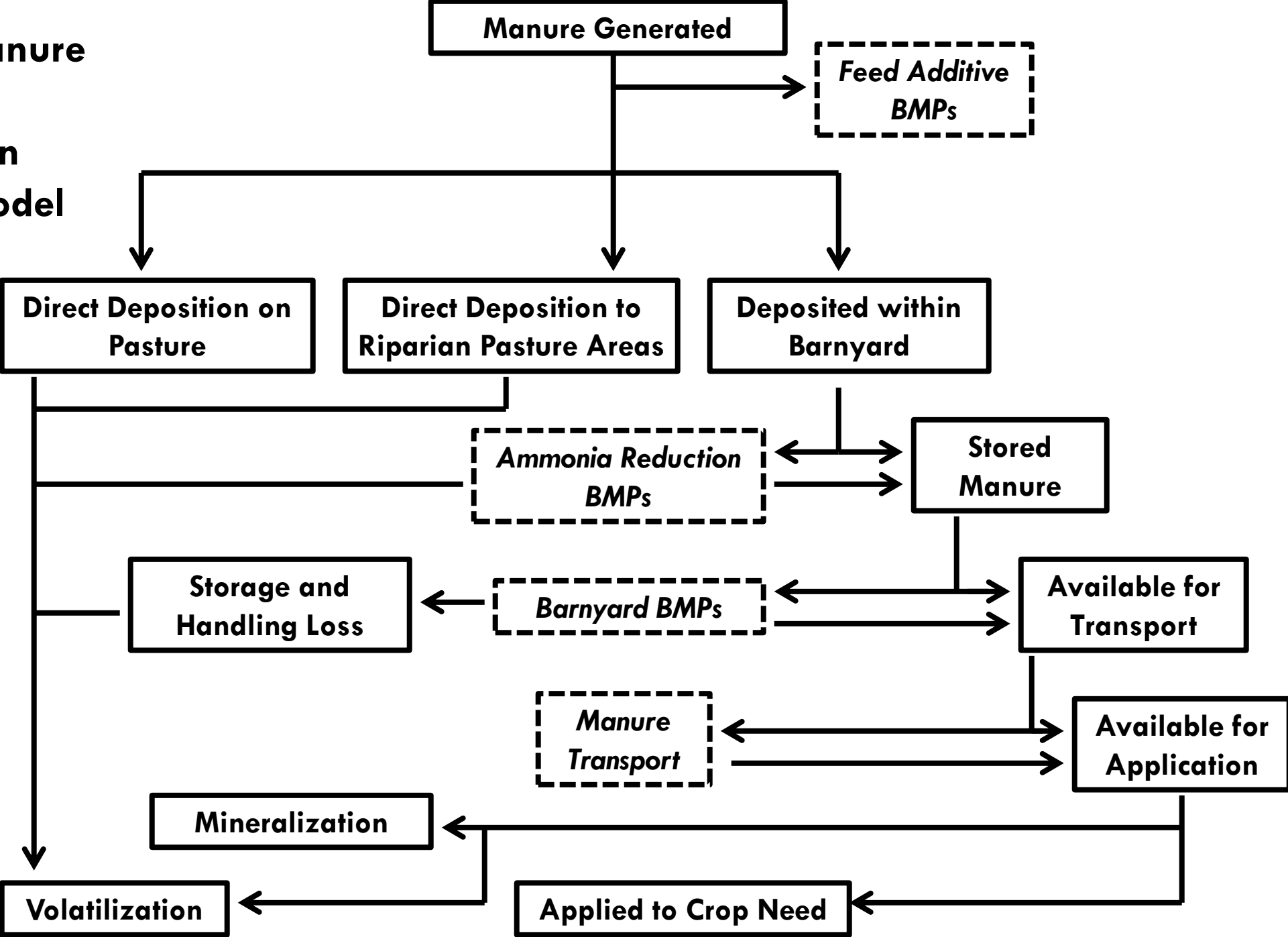


Fig. 3-5
...where to fit
mortality
practices

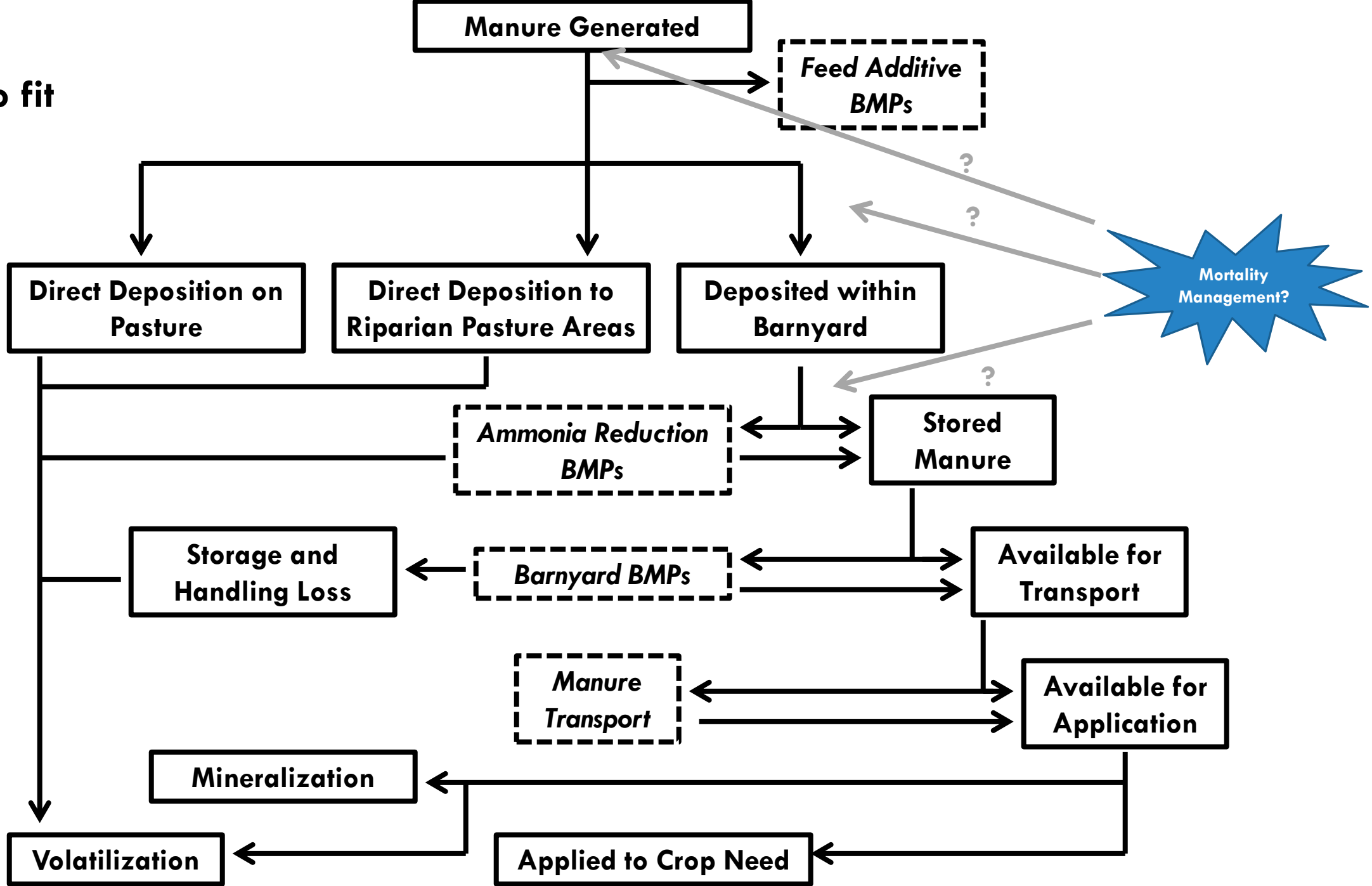
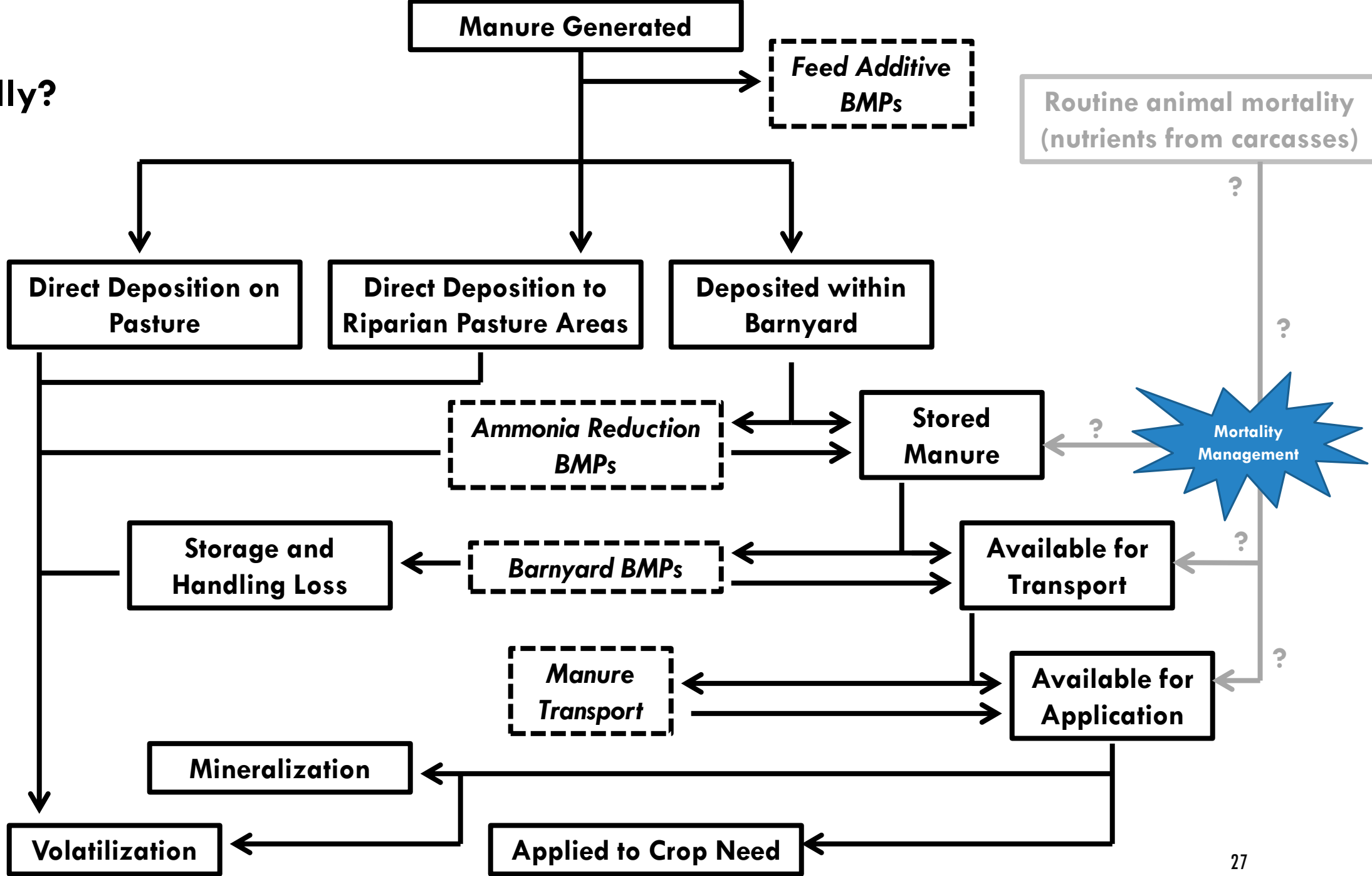


Fig. 3-5
...eventually?



WATER QUALITY QUESTIONS

How many pounds of nutrients are in carcasses?

What percent of nutrients in carcasses get into nearby waterbodies/groundwater following burial without mortality composting*?

What percent of nutrients in carcasses get into nearby waterbodies/groundwater following burial with mortality composting*?

What happens to the nutrients following composting*?

- Land applied?
- Landfill?
- Transported out of watershed?

Do existing AWMS structures already treat carcasses?

***Repeat these questions for other mortality practices (incineration, freezers)**



QUESTIONS?

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