FROM GROWERS TO END USERS

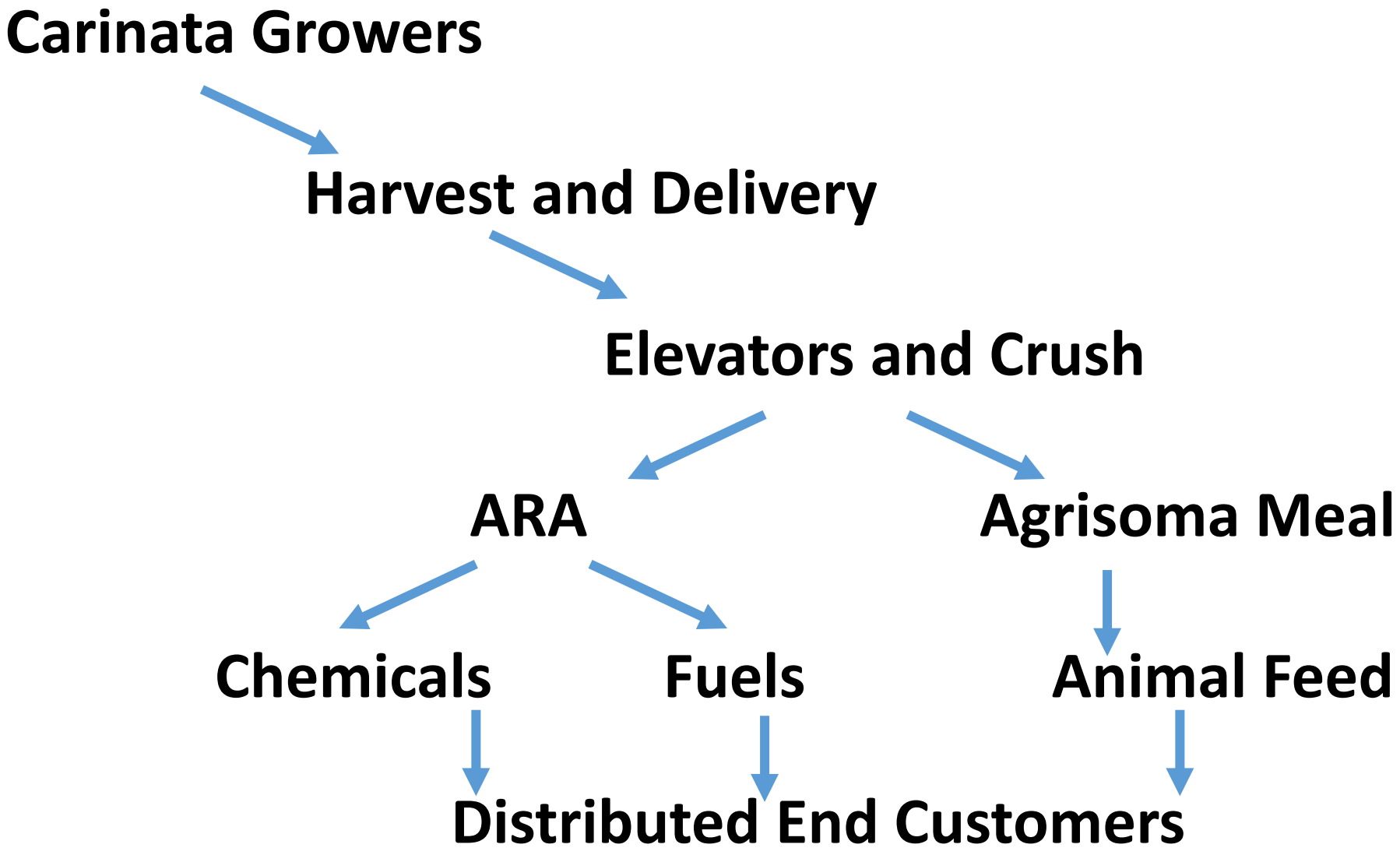
ESTABLISHING CARINATA SUPPLY CHAINS IN THE SOUTHEAST

Supply Chain – from Carinata Growers to End Users

- What are the Supply Chain team goals?
- What are key Supply Chain Process Principles?
- Who are included in the full roster of stake holders?
- How are we addressing Grower needs starting point?
- How is supply chain resiliency achieved – strength in co-products?
- What are Modeling priorities within and beyond the farm gate?
- Which SPARC member states can / are supporting development?

SPARC

Stakeholders – All must win!



SPARC Supply Chain Team Goals

- Enable Southeast specific carinata focused supply chain (growers to end users) in core states (GA, AL, FL)
- Establish path to acceptable business case for all Stakeholders in the supply chain, all co-products. Chain no better than weakest link.
- Build with the modeling team needed databases, operating models, within and outside the farm gate that to create rationale for regional developments

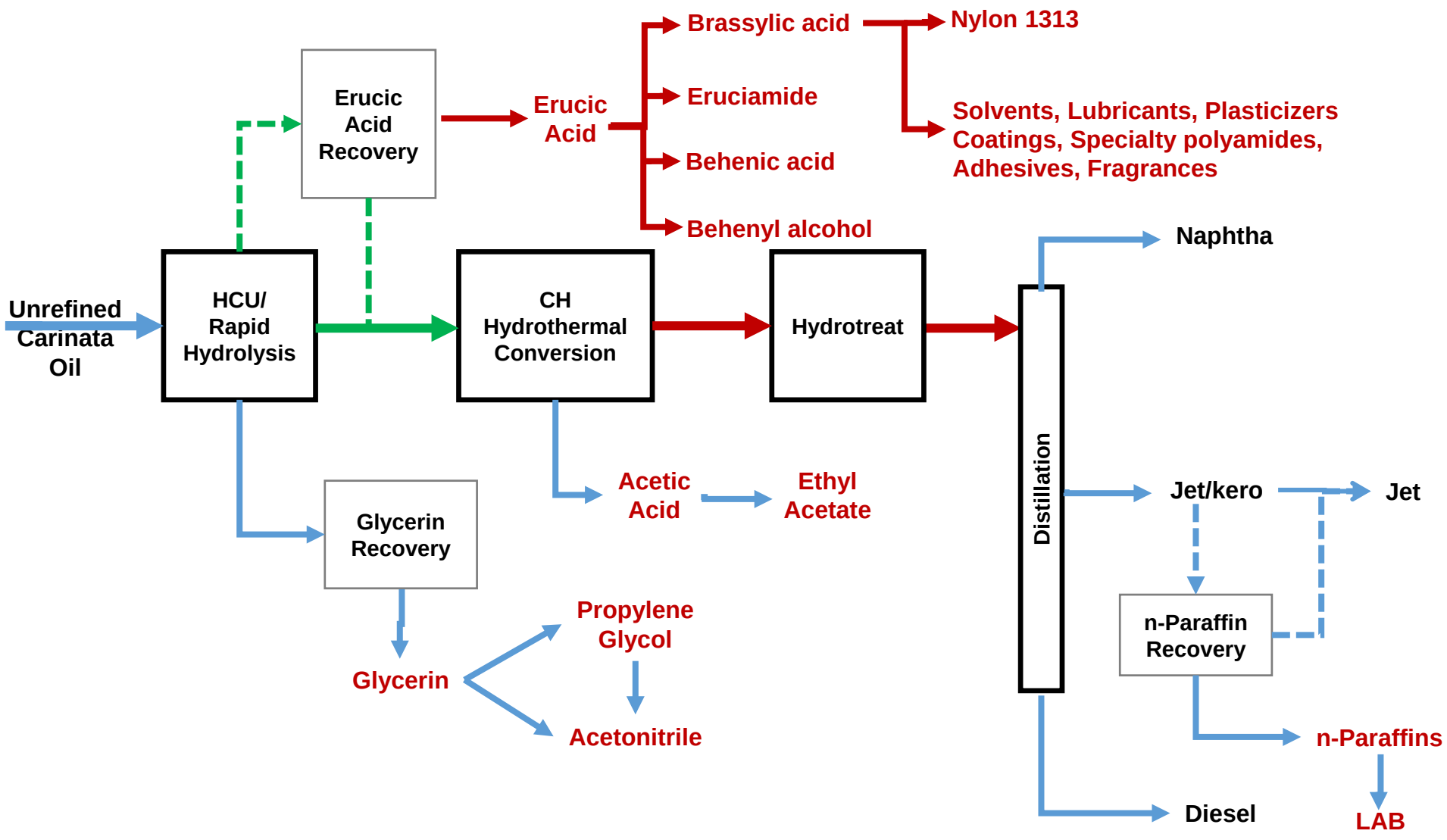
Allow SE Growers, Agrisoma, ARA to compete

Growers need alternative to Winter Wheat

Year	$Price/Bu Harvested	acreage	Total Revenue (gross)
• **2017**	$4.06	70,000	$16M
• **2016**	$4.60	110,000	$28M
• **2015**	$5.35	145,000	$43M
• **2014**	$6.50	230,000	$82M
• **2013**	$7.30	360,000	$145M

90% 5 year revenue drop-off due to Fusarium head blight

ARA Co-products Key to Supply Chain Resilience *



*source ARA

ARA Process Co-Products Best from Carinata*

Co-Products	Potential Partners	Annual Market	Unit Value	Net Annual Income Delta
Free fatty acids for Erucic acid recovery	Emery Oleo Solvay	>7000MT each facility	$0.80/lb	$10-20M
Glycerin to Propylene Glycol	S2G/IPCI	0.2-4M MT industry	$0.50/lb	$10-20M
n-paraffins for LAB (linear alkylbenzene) production	Proctor & Gamble, Sasol	4.3B MT industry	$0.80/lb	$2-4M
Crude Glycerin animal feed	Westway		$0.08-0.10/lb + water, w/w	$0.5-1.0M
Increase yield from high molecular wt.		100bbl/day net increase		$3M

***Source - ARA for 5000 BBL per day baseline facility carinata vs. waste oils /greases**

Modeling Priorities for SPARC Supply Chain

Database Development (e.g.)

- Grain elevators
- Crush facilities
- Carinata prime growth Locations
- Warehouses
- Transport options for distribution
- End customer distribution nodes

Anderson Grain Elevator, Irwin County GA.. Source: Vanishing Georgia

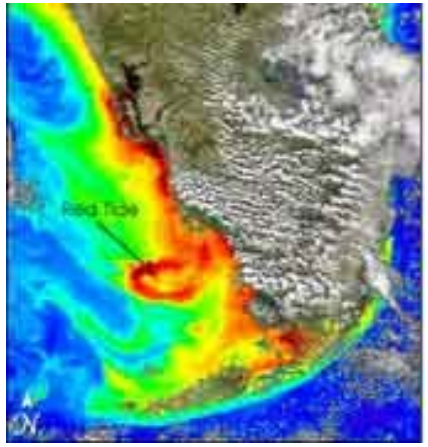
Hartsfield Jackson Airport, Atlanta

Modeling Priorities for SPARC Supply Chain

Process models

- Techno – Economic Analysis (TEA)
- FTOT – Freight / fuel Transport Optimization tool
- Resiliency Evaluation (UVA/NSF benchmark
- Water quantity and quality (UGA modeling), incentives for growers FL)

Oyster bed water quantity



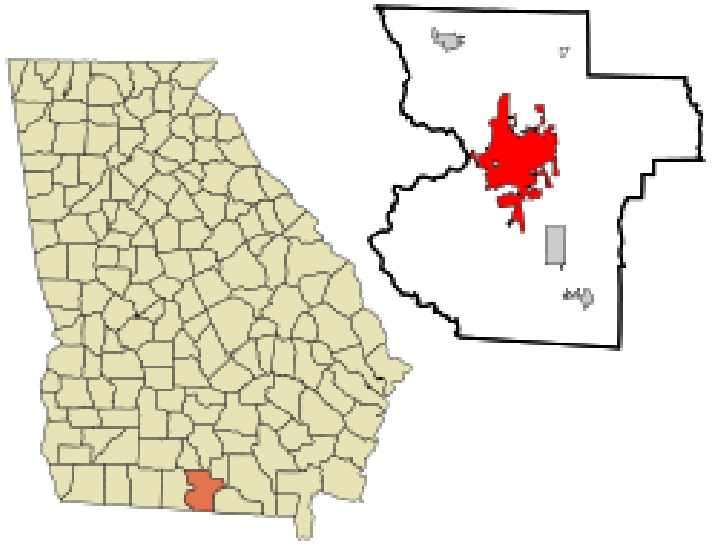
Red tide threat water quality

Differentiating SPARC Carinata Value in the SE

- **Georgia** - Focus on Valdosta, Supply chain case via VAPG
- **Florida** - Support for Trials, Water Quantity/ Quality in scope
- **Alabama** – Carinata trials in Appalachian region

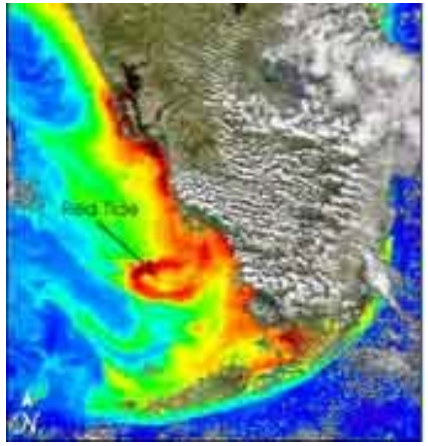
Georgia - Focus on Valdosta

- Value Added Producer Planning grant application (VAPG)
- Submitted by Grower applicant, developed by ARA
- Location optimized for grower concentration, resource availability



Florida – Trial Support , Water Value?

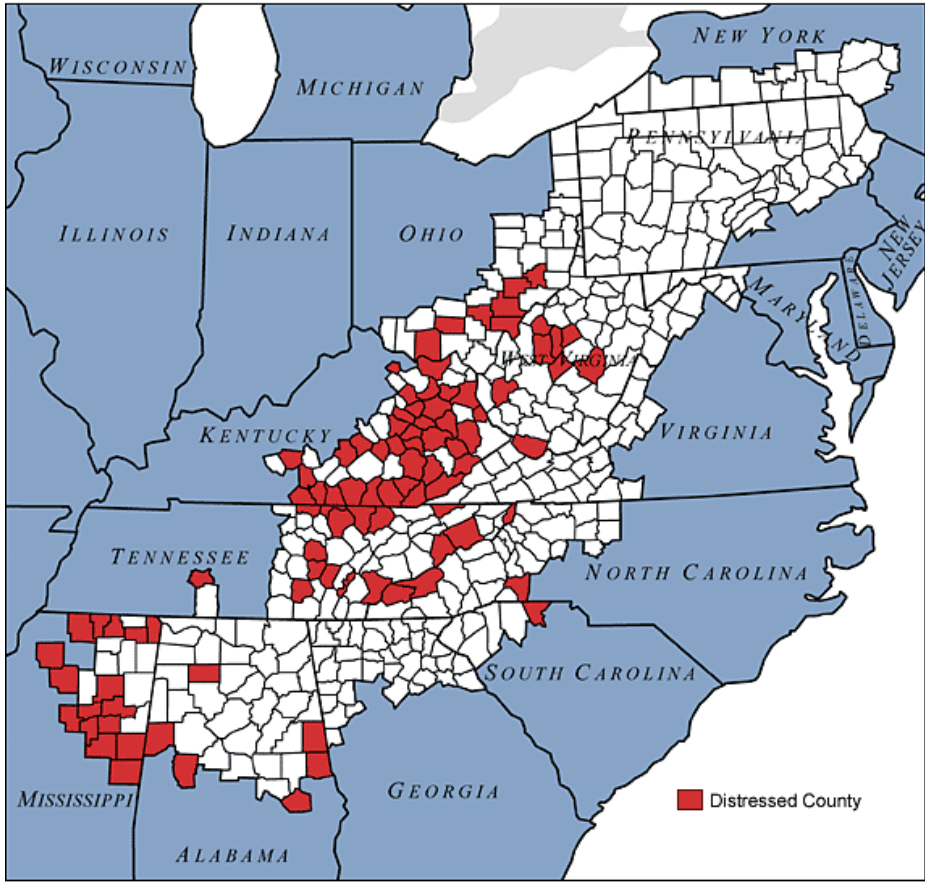
- Support for UFL Trials led to SPARC
- Water Quantity value proposition implemented by FDACS incentives for growers
- Support potential from Oyster growers, Tourism industry



Alabama – Carinata Growth in ARC* region

Scottsboro	Jackson	AL	75
Athens	Limestone	AL	200
Athens	Limestone	AL	100
Fyffe	DeKalb	AL	150
Deatsville	Elmore	AL	100
Prattville	Elmore	AL	100
Deatsville	Elmore	AL	100
Auburn	Lee	AL	200
Shorter	Macon	AL	560
Prattville	Elmore	AL	250
Selma	Dallas	AL	200
Robertsdale	Baldwin	AL	300
Auburn	Lee	AL	200
Samson	Geneva	AL	100

ARC-Designated Distressed Counties, Fiscal Year 2014



Created by the Appalachian Regional Commission

Data Sources:
Unemployment data: U.S. Department of Labor, Bureau of Labor Statistics, LAUS, 2009–2011
Income data: U.S. Department of Commerce, Bureau of Economic Analysis, REIS, 2010
Poverty data: U.S. Department of Commerce, Bureau of the Census, American Community Survey, 2007–2011

ARC APPALACHIAN REGIONAL COMMISSION

Supply Chain – Carinata Growers to End Users

- SPARC Supply Chain Team formed - high level goals established
- Main goal to establish resilient markets for growers that maximize markets and regional competitiveness
- Modeling goals set to ease data gathering and to address implementation challenges
- State participation growing to supplement SPARC