(a) _	Predictive Lipids	Dominant IPL Classes	Potential IPL Remodeling
SQDG.34.3 DG.Total	•		Recycling of PC and BL under N-limitation
DGCC280 PC.DAG280 BC.DAG280 BC.DG320 BC.DG320 BC.DG340 DGDC340 DGDC321 DGDC341 DGDC322 DGDC341 DGDC322		SQDG, DGDG	Recycling of MGDG under high pH/low pCO ₂ , or anaerobiosis
	•		Increased proportion of DGDG and SQDG under thermal stress or high pH/low pCO ₂
SQLTotal PC.DAG.28.1 SQDG.34.2 DGCC.30.0 DGDG.36.0	R ² = .59 RMSE = 4238		Increased proportion of SQDG under shaded conditions
DGDG.30.0	2 3 4 5 6 7 8		Recycling of MGDG and PG under high growth conditions
(b) SQDG.28.0 MGDG.32.2 MGDG.30.0	•		Recycling of BL under N-limitation
MGDG.30.2 MGDG.32.1 PC.DAG.32.0 MG.Total PC.DAG.28.0 PG.DAG.28.0 PC.DAG.30.0 SQDG.30.1		MGDG, SQDG, PC	Increased proportion of SQDG under thermal stress, shaded conditions, and high pH/low pCO ₂
C PE_DAG.30.1 DGDG.30.0 SQ.Total MGDG.34.1 DGTS.30.0 PC_Total	R ² = .54 RMSE = 543		Increased proportion of MGDG for photoprotective and antioxidant mechanisms
MGDG.34.0 MGDG.30.3 MGDG.36.2	2 4 6 8 10 12		Recycling of PG under high growth conditions
(C)			
MGDG.30.0 MGDG.34.0 MGDG.34.0 DGDG.34.0 DGDG.32.0 DGDG.32.0 DGDG.28.0 DGDG.28.0 DGDG.28.0 DGDG.28.0 DGTotal MGDG.30.1 MGDG.30.1 MGTotal SQDG.32.2 PE DAG.32.2 PE DAG.32.2 SQDG.30.0 MGDG.34.1 PC.DAG.38.6	•	BL, DGDG, MGDG	Recycling of PC under N-limitation
			Enhanced DGDG under thermal stress
			Enhanced MGDG for photoprotective and antioxidant mechanisms
	R ² = .50 RMSE = 167		Recycling of SQDG and PG under high growth conditions
PC.DAG.32.1	4 6 8 10		
(d)			
MGDG.30.0 DGCC.32.0 PC.DAG.28.0 DGCC.30.0 PC.DAG.32.0 PC.DAG.32.0 PC.Total	• • • • • • • • • • • • • • • • • • •		Recycling of MGDG under high pH/low pCO ₂ or anaerobiosis
MGDG.32.1 PC.DAG.30.0 BL.Total		PC, BL, DGDG	Enhanced DGDG under thermal stress
DGDG.30.0 PG.DAG.32.0 DGDG.34.4 DGDG.34.3 DGDG.32.1 MGDG.32.2	R ² = .49		Recycling of SQDG, MGDG, and PG under high growth conditions
PG.DAG.32.0 PG.DAG.34.1 DG.Total PG.DAG.34.2 DGTS.28.0	• • • • • • • • • • • • • • • • • • •		
(0)	4 5 6 7 8 9		
(C) DGTS.28.0 MGDG.30.1 DGDG.32.4	•		Recycling of PC under N-limitation
DGIDS 32.4 DGIDS 32.1 MGDG 28.1 PE DAG 34.2 PE DAG 30.1 DGIDS 30.0 DGIDS 30.0 DGIDS 30.0 PE DAG 32.2 PE DAG 32.2 PE DAG 32.2 PE DAG 32.1	•	PE, BL	Recycling of MGDG under high pH/low pCO2 or anaerobiosis
	R ² = .51		Increased proportion of SQDG under shaded conditions
MGDG.32.1 DGDG.32.5 PE.DAG.34.1 BL.Total MGDG.30.3 MGDG.34.5	RMSE = 33		Recycling of SQDG, MGDG, and PG under high growth conditions
% Reduction in Model RMSE			