SESSION 8: MEQ Topic Session Using environmental indicators to assess baselines, targets, and risk of plastic pollution in the North Pacific

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Assessing impacts of plastic accumulation in Laysan Albatross (*Phoebastria immutabilis*) chick growth and body condition

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Laysan albatross (*Phoebastria immutabilis*) are characterized by a high frequency of occurrence and loads of ingested marine plastic debris. While there is correlational evidence of delayed growth and depressed body condition in albatross chicks with larger ingested plastic loads, very little is known about how this material accumulates in their two stomach chambers (proventriculus, gizzard).We measured the growth and body condition of 130 chicks from French Frigate Shoals and necropsied 44 salvaged chicks. We used these specimens to: (1) document the accumulation of ingested plastic through their development (February – July); and (2) investigate impacts of plastic ingestion on their growth and body condition. First, we documented distinct trends of ingested plastic mass in the two stomach chambers. While gizzard plastic increased through chick development, proventriculus plastic increased initially and declined once chicks started casting boluses. Thus, the combined mass of ingested plastic levelled off during the chick-rearing period (19-90 days), but the proportion of plastic in the gizzard peaked during the bolus-casting period (>90 days). Second, we related four chick growth metrics to body condition and ingested plastic mass using PCA.PC1 was positively correlated with gizzard plastic mass and PC2 was positively correlated with proventriculus plastic mass and body condition. These results do not suggest that higher plastic loads cause slower chick growth or depressed body condition. However, because fledging success was significantly lower in the study year (2011), compared to the 2006-2011 baseline, the plastic signal may have been swamped by other factors, including food-provisioning and dehydration.